



**INFORMATION TECHNOLOGY IN A COMPLEX ECONOMY:
THE AFRICAN OIL AND GAS INDUSTRY**

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Master of Commerce in Project Management**

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Design at the Cape Peninsula University of Technology**

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DECLARATION

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Date

ABSTRACT

The energy sector is fast nearing a tipping point of no turning back. Transitioning from fossil fuel to renewable energy holds both threats and opportunities for businesses across the world. Africa is a continent rich in natural resources. The World Bank predicts that by 2020 only four or five African countries will not be involved in mineral exploitation. However, the continent is in economic, political and social crises with the majority of Africans living in poverty. As an enabler of business, business expects information technology (IT) to support, grow and maintain their existing portfolio of IT products and services while at the same time innovate and build new IT competencies to respond rapidly to the transition towards renewable energy.

But, IT leadership is blamed for being rigid and unable to service the evolving needs of their organisations. As a result, traditional management theory is failing IT leadership in responding to the rapid rate of change required for serving as an enabler and transformational agent for business in leveraging technology to create a competitive advantage. As an enabler of business, the rate of implementing new products and services has a direct impact on organisational competitiveness, something that traditional management theory does not provide for. Theory tells us what technical skills the IT department requires; it does not tell us what people skills are required. In addition, business managers in Africa need to develop the ability to integrate traditional and conventional management styles to resolve the unique challenges they face.

The implementation of an effective and efficient IT department remains problematic for business and IT management as traditional management theory does not necessarily support the implementation of IT within organisations in the African Oil and Gas industry. This research *explores the disconnect between traditional management theory and the way that IT implementation works within the African Oil and Gas industry.*

The study followed an inductive research approach. The research paradigm fluctuated between exploratory humanism and interpretivism. The African Oil and Gas industry presents the case study. A multistage mixed-model research design (a subset of mixed method research) was followed, combining quantitative data with qualitative data in order to add depth to the findings. The multistage mixed-model research design allowed for the collection and corroboration of data and enhanced the credibility of the study. This design was used to expand the qualitative and quantitative data collected by challenging the results from both methods.

Using multistage mixed-model research, the quantitative data were converted into qualitative narratives to be analysed qualitatively. Data analysis was done sequentially. A coding schema was developed prior to the collection of data. These focus areas were grouped into themes. Each theme was given a clear description. Coding of the statements presented in the survey questionnaires was done prior to the collection of the data, while coding of the qualitative data was done by the researcher when reading through the transcriptions of the interviews and segmenting the data into the corresponding themes. The research validity was ensured using the 'content validity' criteria to secure adequate coverage of the investigation questions while the research reliability was ensured using the internal consistency method and triangulation.

Three data collection techniques were used to collect data. Qualitative data were collected using semi-structured interviews (Stage II). To support the interviews, observations were made to enrich the data collected by allowing the researcher to see things that participants were possibly not aware of or not willing to discuss. Surveys using questionnaires (Stages I & IV) and a workshop using Lewin's Force Field Analysis theory (Stage III) were used to collect quantitative data. The participants in each of the data collection stages changed with some overlap where participants took part in the Stage I survey and Stage II interviews as well as the Stage III Force Field Analysis workshop and the Stage IV survey.

From the literature review and research it is evident that traditional management theory alone is no longer sufficient and effective in ensuring successful IT implementation. Business and IT priorities have changed and new capabilities emerged which are considered important compared to traditional planning, organising, directing and controlling, which have faded in importance. These new management capabilities and competencies focus on advancing the business processes to improve the agility and efficiency of business operations. Capabilities such as innovation (creative thinking, idea generation and enterprise architecture) and people (intellectual qualities, emotional intelligence, practical intelligence and partnerships) are growing in importance. Innovation management is changing the role of IT in the organisation as an enabler of business, removing and solving business problems through creative thinking. People management ensures that the organisation has the right mix of people onboard, providing them with an environment that supports personal growth to deliver future focused capabilities to position the organisation for competitive success within their industry.

IT leadership is becoming a critical role in supporting business. Idea prioritisation and portfolio management are becoming key capabilities for meeting the increasing demand for innovation and agility. In addition, risk management is rising in importance due to concerns

among regulators about the resilience of IT delivery, especially those of critical importance to the sustainability of the business (King III, 2009). To summarise:

- i) Traditional management theory fails to unite the business culture and the IT culture into a single business culture that services the needs of the organisation.
- ii) Traditional management theory lacks the ability to transform the organisation and IT resources in a changing environment.
- iii) Traditional management theory does not recognise the importance of emotional intelligence as a key competency for organisational competitive advantage.
- iv) Traditional management theory does not recognise the importance of innovation and creativity as a competency for organisational sustainability.

Little research has been done on the subject of cultural diversity and its impact on successful IT implementation in the African Oil and Gas industry. When cultures are our own, they often go unnoticed until we try to implement a new strategy or programme which is incompatible with the receiver's central norms and values, and then we observe first-hand the power of culture. The researcher hopes to make IT leadership more aware of the influence and impact of multiculturalism on the successful implementation of an IT strategy in the African Oil and Gas industry. To address this gap, the researcher recommends the following research:

- i) What is the role of emotional intelligence in creating a corporate *culture* where business and IT collaborate as equals towards a common goal?
- ii) How to define IT *key performance indicators* that drive the right corporate behaviour.
- iii) How does IT show the value they are adding to EXCO and the Board of Directors?

Keywords: Agility, Alignment Models, Change Management, Communication, Culture, Emotional Intelligence, Enterprise Architecture (EA), Force Field Analysis (FFA), Innovation, Management Theories, Practical Intelligence, Staffing, Strategic Partnership.

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GLOSSARY OF TERMS

- Business Process Engineering** Business Process Engineering is the *end-to-end formulation of all business processes*, including the complete overhaul of all key business processes and the simulation thereof, with the objective of enhancing *performance measures* such as return on investment, cost reduction and quality of service. Business Process Engineering encompasses the complete range of critical processes which span the Oil and Gas value chain. It includes the administration, prioritisation and change management associated with business process management.
- Gartner** Gartner is a leading information technology research and advisory company. Though Gartner's research holds no academic value, referencing Gartner in the context of this research complements and enriches the academic literature as it influences the views and opinions of actors in the real world during the formation and implementation of IT governance.
- IT implementation** Information technology (IT) implementation in the context of this thesis is not limited to the deployment of new information and communications technology (ICT) products and services. IT implementation in the context of this thesis is inclusive of *Business Process Engineering, IT Solutions Engineering, development, implementation, maintenance and support, and IT portfolio management*, as required by African Oil and Gas companies to run, sustain and grow their businesses (researcher's own definition).
- IT Solutions Engineering** The formulation of a plan to build an IT product or service with a specified performance goal. The engineering design process is a multi-step process including the research, conceptualisation, feasibility assessment, establishing design requirements, preliminary design, detailed design, production planning and tool design, and finally, production. This process involves a number of steps (some to be repeated before delivering a final product or service) to meet a desired need. It is a decision making process (often iterative) to convert resources optimally to meet a stated objective. Among the fundamental elements of the design process are the establishment of objectives and criteria, synthesis, analysis, construction, testing and evaluation. Implementation is the process of optimising resources, reducing the cost of doing business, and shorter lead-times to production. Implementation includes but is not limited to organisational change management, training, testing, go-live and evaluation.

IT portfolio management	A set of management principles and processes to ensure the on-going and <i>future maintenance</i> of all IT products and services. Delivering high levels of <i>security</i> and <i>availability</i> , utilising stringent standards for data protection, business and systems continuity, disaster recovery, and regulatory compliance.
The Oil and Gas industry; upstream, midstream and downstream	The Oil and Gas industry is divided into three major sectors: upstream, midstream and downstream. This is also referred to as the <i>value chain</i> . The upstream sector is also known as exploration and production (E&P) and includes the exploration for potential underground or underwater crude oil and natural gas fields, drilling of exploratory wells, and bringing the crude oil or raw natural gas to the surface. The midstream and downstream activities take place after the E&P phase. The midstream activities relate to the refinement of raw material (crude oil and natural gas) into liquid fuel products, while the upstream activities relate to liquid fuels logistical infrastructure, marketing, trading, and point-of-sale of oil and petrochemicals.
Traditional	In the context of this thesis it means an old or commonly used style, approach, custom and belief—‘commonly’ refers to <i>time honoured</i> and ‘custom’ <i>being a tradition</i> .
Service aggregator	Service aggregators offer a variety of services that the customer might handle directly: identification of functions that might be effectively outsourced; definition of requirements for obtaining third-party services; and procurement of management services, including preparation of request for proposals, due diligence, selection, evaluation, negotiation, transition management, effectiveness assessment, optimisation planning and iterative realignment, and the re-design of functions and services to be outsourced (Outsourcing Law Global, 2015).

CHAPTER ONE: INTRODUCTION

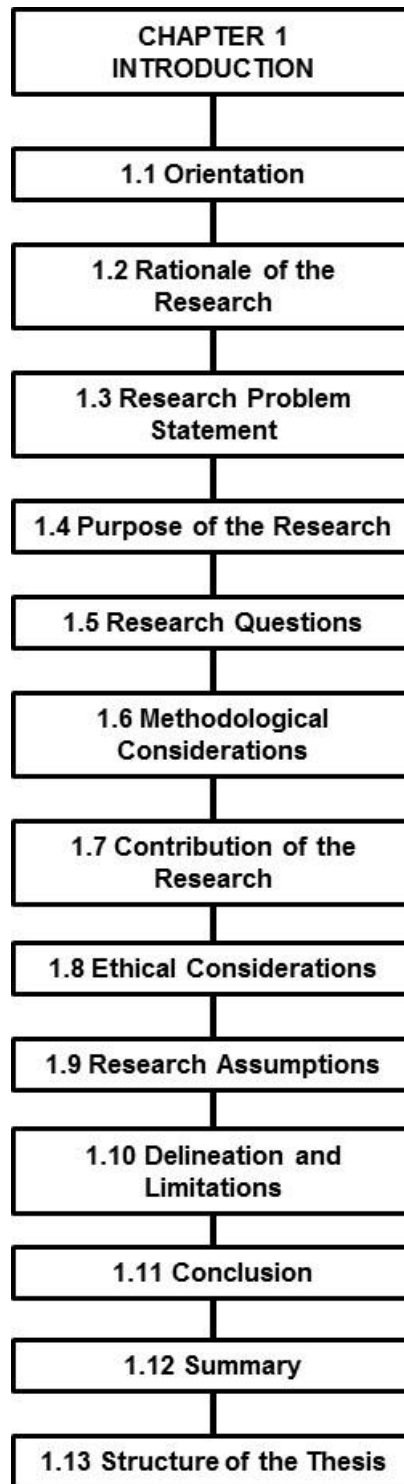


Figure 1.1: Chapter Orientation

1.1 ORIENTATION

The implementation of an effective and efficient Information Technology (IT) department remains problematic for business and IT management as traditional management and in practice does not necessarily support the successful implementation of IT within organisations in the African Oil and Gas industry. This thesis explores the implementation of IT in a complex economy with reference to the African Oil and Gas industry. In order to explore the implementation of IT in the African Oil and Gas industry it is important to know what the complexities are that organisations face when implementing IT in the organisation as well as how organisations deal with these complexities. During and after the implementation of IT in the organisation, IT professionals find it difficult to respond to the demands of the organisation on the IT department. It is not clear why this is the case.

With energy consumption at the centre of most economies, economists and ecologists may have different views on the world we live in today. The economists focus on short-term growth while ecologists focus on resource depletion and ecological demands over the long-run.

According to McKinsey (2010), the gross domestic product (GDP) in Africa between 2000 and 2008 is double the growth experienced in the 80s and 90s. Natural resources contribute to the growth, however little is known about the spread, quality, quantity and cost of exploring and producing these resources commercially on the African continent. Renewed concerns exist about Africa's ability to sustain this economic growth due to droughts, poverty, disease and high infant mortality while the global demand for raw minerals is rising (Leke, Lund, Roxburgh & Van Wamelen, 2010; McKinsey, 2010).

The coming online of several oil producing countries such as Mozambique, Nigeria and Zambia contributes to an increase in oil export volumes in the region. With the short-term increase in supply, the world experienced a 5.6% reduction in the oil price during the first six months of 2013 compared to the same period in 2012. The World Bank (2013) warns that if a one-standard-deviation decline, based on the current oil baseline, is applied to the oil price, a shock is looming for the oil-exporting countries in Sub-Saharan Africa with GDP growth in 2014 predicted to decline from -3.8 % to -10.8% (Figure 1.2).

This is good news for importers of oil in the region as all industries, agricultural to manufacturing, are dependent on energy in some form or another.

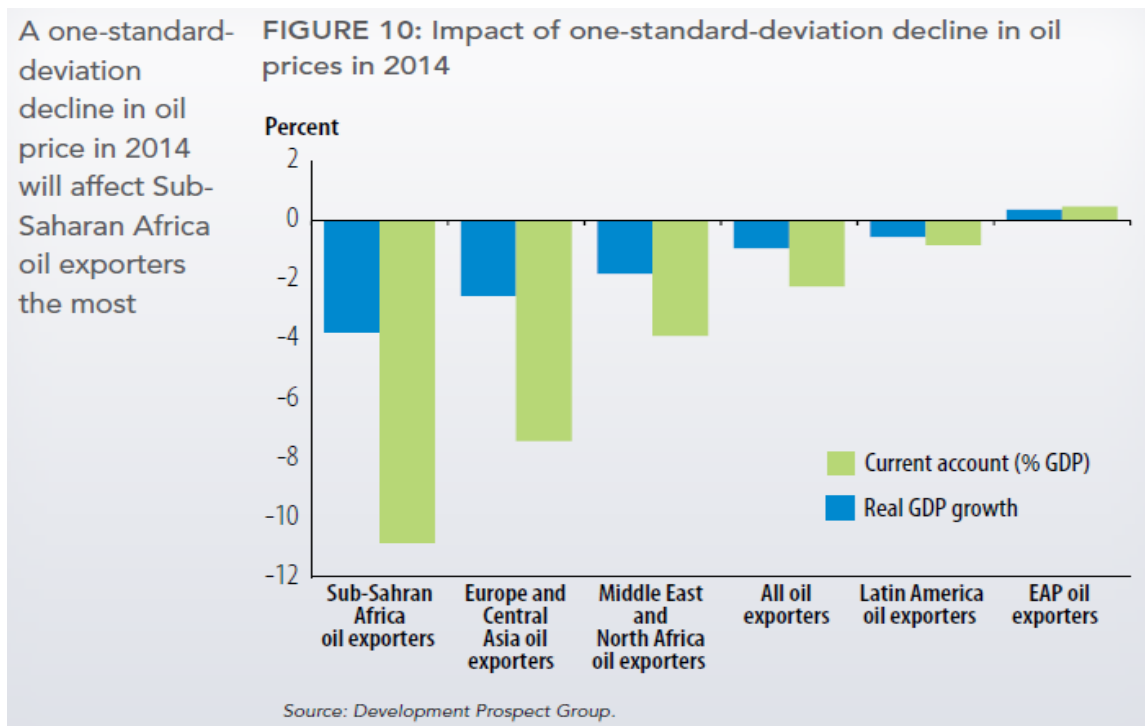


Figure 1.2: Impact of one-standard-deviation decline in oil prices in 2014
(Chuhan-Pole, Christiaensen, Dennis, Kambou, Angwafo, Buitano, Korman, Galindo Pardo & Sanoh, 2013:10)

Africa needs to accelerate poverty reduction in order to maximise the value generated through the economic growth across the continent. According to the World Bank (2013:14):

“Growth with equity in Africa will require: (i) resilience to external shocks; (ii) improvements in agricultural productivity; (iii) productive non-agricultural jobs in both rural and urban areas; and (iv) better safety net programs, particularly in countries benefiting from large economic rents from natural resources”.

To eliminate poverty, jobs must be created in both the formal and informal sectors (McMillan, 2013). Further contributing to the elimination of poverty is the migration of low productivity jobs to higher productivity jobs.

In addition, a company’s ability to trade and compete internationally is relative to its access to labour, capital, infrastructure and natural resources (Martin, 2003; Huggins, Izushi, Prokop & Thompson, 2014). Africa’s lack of infrastructure and skilled labour as well as the mismanagement of its natural resources gave Africa the reputation of being an exporter of natural resources rather than a manufacturer of goods and products (Wood & Berge 1997; Wood & Mayer 2001). Fujita, Krugman and Venables (1999) argue that when suppliers join forces to share and reduce production cost, an economy similar to India’s high-tech information technology can emerge. In Africa, as an emerging industry this still needs to be realised.

As business complexity (hereafter referred to as a 'complex system') and competition for resources increase organisations are pressured to make their processes more effective to respond to the changing macro socioeconomic and environmental pressures (Fisk, 2010). While businesses are attempting to respond to these pressures, shareholders expect sustainable growth in revenue and market share. Managing and sustaining the adaptability of such a complex system is challenging.

As an enabler of business, IT has become a source of legacy rigidity, long lead-times (for the deployment of business solutions) and complexity rather than a platform for adaptability (Morton, 1991; Ward & Peppard, 1995; Weil & Broadbent, 1998; Luftman, 2003; Chan & Reich, 2007; Gartner, 2010). Contrary to this, the IT department should provide heterogeneous and dynamic processes that provide for scalability, complexity, efficiency, manageability and robustness (Scholtes & Tessone, 2011).

Edwards, Ishaq and Johnsen (2010) as well as Rajan (2011) show that through dynamic processes, technology makes it possible, in an environmental friendly manner, to discover and produce oil and gas resources from previously difficult to reach geographical locations. Edwards, Ishaq and Johnsen (2010:1) state that organisations involved in the production of oil and gas need to:

“...integrate strategic production and information technology to enable key success factors: performance management, enterprise risk management, operational excellence, people management and adaptive business models by 2030”.

Adaptive business models fulfil two key functions. Firstly, while creating business efficiency, adaptive business models capture portions of the value chain, which when put together in different combinations, could open new markets through the creation of new value added business products and services (Chesbrough, 2007). The second function of adaptive business models allows for organisations to create a position of competitive advantage similar to the exploration of fossil fuels in previously uncharted geographical locations through the use of technology.

Developing and capturing adaptive business models require people and technical competencies. For IT to fulfil its mandate, IT professionals need to develop people skills to manage the complexities (Joseph, Ang, Chang & Slaughter, 2010). The current people skills that IT professionals have are not sufficient to do their job (Joseph *et al.*, 2010). According to Joseph *et al.* (2010), theory defines what technical skills the IT department requires but it does not mention what people skills are required. IT professionals' inability to build relationships result in them failing to fulfil the IT department's role as an enabler of business in order to meet shareholder expectations for sustainable growth (Rockart & Scott Morton,

1984; Cash & Konsynski, 1985; Porter & Millar, 1985; Earl, 1987; King III, 2009; Van Blerk, 2013). This inability to build and manage relationships, as proposed by traditional management theory, results in the deterioration of business value and possible competitive advantage. Traditional management seems inadequate to meet the expectations that business and shareholders have of IT implementations (Nagle & Golden, 2009; Tallon & Pinsonneault, 2011).

Management theories are designed to enable organisations to plan the future with confidence. Organisations should reflect on society and its need for constant change and alignment (King III, 2009; Van Grembergen & De Haes, 2010; Brooks, 2011; Stehlik, 2014). Management theories describe the impact of time (i.e. culture, technology, politics, socioeconomics, etc.) on the various business scenarios and predict how a process will respond towards sustainable success when exposed to the different environmental forces. Smit, Cronje, Brevis and Vrba (2011) argue that theories could bring predictable success to the world of management (refer to Chapter Two for an in depth discussion on management theory).

Smit *et al.* (2011) argue that business managers in Africa need to develop the ability to integrate traditional and conventional management styles (i.e. planning, organising, leading and controlling) to resolve the unique challenges they face. These challenges include but are not limited to workforce diversity, employment equity, trade unions, industry charters, globalisation, mobile workforces, competition and shorter product lifecycles.

To succeed, IT needs to acquire management skills and competencies to apply the management style that best serves the situation, enabling them to plan the future for predictable success (Peterson, 2003; Sun & Chen, 2006; Smit *et al.*, 2011).

1.2 RATIONALE OF THE RESEARCH

Heterogeneous and dynamic processes allow an IT department to deliver products and services that provide for scalability, complexity, efficiency, manageability and robustness of systems. The ability to enable and transform business lies within the level of alignment of business and IT strategies. Alignment between business and IT will assist the organisation to collaborate towards a shared vision, while the maturity of their relationship will improve organisational performance (Reich & Benbasat, 2000; Sabherwal, Hirschheim & Goles, 2001; Kearns & Lederer, 2004; Chan, Sabherwal & Thatcher, 2006; Kearns & Sabherwal, 2007). Organisations find it challenging to explain how strategic IT investment benefits the organisation at large (Heath, Singh & Shepard, 2013). The challenges that IT professionals face when explaining the IT investment is as a result of the complex nature of managing the continuous alignment between business and IT strategies (El-Telbany & Elragal, 2014).

The inability of IT professionals to build and manage relationships, as proposed by traditional management, resulted in the deterioration of business value and a possible loss of competitive advantages. Joseph *et al.* (2010) argue that IT professionals do not possess the people skills to fulfil its mandate. As an enabler of business, IT lacks the agility to manage and respond to the changing and evolving requirements of business in a timely manner to deliver sustainable stakeholder value (Grindley, 1992; Ward & Peppard, 1995; Weil & Broadbent, 1998; Shane & Venkataraman, 2000; Luftman, 2003; King III, 2009; Brooks, 2011).

The use of traditional management as an approach to develop the needed people skills and competencies is inadequate to meet the creative, innovative and changing expectations that business and shareholders have of IT implementations (Mealiea & Baltazar, 2005; IBM, 2008; Bloch, Blumberg & Laartz, 2012; Van Blerk, 2013; Svejvig & Nielsen, 2014; Altahtoo & Emsley, 2015). The radical changes IT professionals are creating come with new requirements such as competitive strategies and more importantly, the need for new management techniques (Agwu & Murray, 2015).

1.3 RESEARCH PROBLEM STATEMENT

The research problem within the ambit of this thesis reads as follows: The implementation of an effective and efficient IT department within a complex environment remains problematic for business and IT management as traditional management does not necessarily support the implementation of IT within organisations in the African Oil and Gas industry.

1.4 PURPOSE OF THE RESEARCH

The purpose of this research is to *explore* and *understand* the disconnect between traditional management and the way that IT implementation works within the African Oil and Gas industry. The research is further directed to explore and understand the driving forces behind the successful implementation of IT in a complex environment.

The research proposes a management framework to support the implementation of an efficient and effective IT department within organisations in the African Oil and Gas industry.

1.5 RESEARCH QUESTIONS

In response to the research problem the researcher defined three research questions, each consisting of a number of sub-questions, to determine the disconnect between traditional management and the way that IT implementation works within a complex economy—the

African Oil and Gas industry. The questions, sub-questions and objectives of each question are presented in table 1.1.

Table 1.1: Research questions, sub-questions, and question objectives

Research Question 1	What are the complexities of IT implementations within organisations?
Sub-Question(s)	Objective
1.1 What role does traditional management play in IT implementations?	To determine the variables between traditional management theories and those management theories required for successful IT implementation.
1.2 How do relationships within IT and IT teams influence IT implementations?	To determine the effect relationships have on the agility of the internal IT department.
1.3 How does the IT department contribute towards sustainable stakeholder value in a changing environment within the context of traditional management approaches?	To identify the driving forces behind successful IT implementation.
1.4 Why does the application of traditional management not deliver successful IT implementations?	To determine the effect traditional management theories have on the agility of the internal IT department.
Research Question 2	Why do IT professionals find it difficult to respond to the demands of business in a traditionally managed environment?
Sub-Question(s)	Objective
2.1 How do management competencies affect the IT department's ability to deliver successful IT implementations?	To establish the management profile and attitudes for successful IT implementation.
2.2 Why are technical skills not sufficient for successful IT implementations?	To determine what patterns emerge in terms of the Practical Intelligence of selected IT professionals.
2.3 How do organisations recognise the value of, and give due recognition to IT resources?	To determine what patterns emerge in terms of the Emotional Intelligence (EI) of selected IT professionals, in order to identify which main clusters of EI competencies are needed for improved functioning in these roles.
2.4 What are the most important IT management skills for non-IT executives/ ESPs?	To establish the management profile and attitudes for successful IT implementation.

Research Question 3	How do organisations deal with the complexities of IT implementation?
Sub-Question(s)	Objective
3.1 Why do organisations struggle to deal with the complexities of IT implementations?	To determine what patterns emerge in terms of organisational change in IT implementation and the role of IT.
3.2 How do organisations implement complex IT strategies?	To determine the relationship between IT and business.
3.3 What is the value of IT understanding the business drivers and speaking the language of business?	To determine the patterns emerging in terms of business and IT alignment during successful IT implementations.

1.6 METHODOLOGICAL CONSIDERATIONS

As a practicing CIO in a leading African Oil and Gas company, with more than 12 years of experience in the Oil and Gas industry, the researcher experienced that IT departments have difficulty achieving and sustaining alignment with business, partners and their external service providers. Contributing to this inefficient alignment is the inability of the IT department to integrate organisational culture, process and business relationship management principles with the business model. The preferred IT business model should make a positive contribution to business agility, performance and productivity.

This section provides a brief overview of the methodological considerations followed in the research project. Chapter Three provides an in-depth discussion of the research design and methodology adopted to answer the research questions.

1.6.1 Research philosophy

The researcher explored the subjective meanings of the actors (people) involved in the industry as defined by the study. The researcher acknowledges that he has opinions and perceptions of the world that he has explored.

According to Saunders, Lewis and Thornhill (2009), there are three primary research philosophies: *ontology*, *axiology* and *epistemology*. Whereas ontology is concerned with the researcher's views on the nature of social reality, axiology is concerned with the role our values play in our research choices, and epistemology describes how one comes to know reality.

The complex environment is driven by people within a specific context. They react and interact in different ways to different situations. *How* and *why* people react in a specific way

was explored as well as how people manage the complex environment they function in. The researcher interpreted the actions of the people in order to propose a new approach to manage IT implementation in this complex environment.

The **ontological** position is *subjectivism* and the **epistemological** position is that of *interpretivism* where reality is accessed through social construction by exploring the experiences of others.

1.6.2 Research strategy

The research strategy defines the plan in answering the research questions. The selection of the research strategy was guided by the research objective, questions and resources available to the researcher (Yin, 2009), as well as his own philosophical orientation. An inductive research approach was followed while the research paradigm fluctuated between exploratory humanism and interpretivism. This research adopted a case study strategy where the researcher studied the African Oil and Gas industry as the case. Quantitative and qualitative data were collected through questionnaires, interviews and a workshop using Lewin's (1951) Force Field Analysis (FFA) theory as a means of triangulation to validate the data collected through the questionnaires and interviews (Cameron, 2009). The data were analysed using the mixed-model research approach (Venkatesh, Brown & Bala, 2013).

1.6.3 Research approach

According to Ivankova, Creswell and Plano Clark (2012), literature recognises three research approaches, namely *quantitative*, *qualitative* and *mixed methods*. The choice of a research approach is informed by the researcher's philosophical orientation, type of knowledge sought and the methods used to obtain this knowledge.

In quantitative research the relationships between variables using numerical data are tested. Research questions are formulated in order to observe and measure these variables. According to de Vos and Schulze (2002), Ashworth (2008) and Nieuwenhuis (2010), the philosophy is grounded in positivism, objectivism and rationalism. Qualitative research is conducted in a natural setting where the researcher aims to understand and interpret a central phenomenon (Creswell, 2007) as opposed to the objective, deductive and quantitative approach. The approach is grounded in interpretivism and constructivism, among others. A mixed methods research approach combines quantitative and qualitative data to investigate a phenomenon more completely (Swanson & Holton, 1997; Hearn, 2010; Perry, 2012; Fetters, Curry & Creswell, 2013).

A **mixed methods** research *approach* was used in this study to utilise the benefits of both the quantitative and qualitative approaches, as well as to explore the research phenomenon from multiple perspectives (Ivankova, Creswell & Plano Clark, 2012).

1.6.4 Research design

According to Johnson and Onwuegbuzie (2004), a mixed methods research approach compliments qualitative and quantitative research. It provides a framework to design and conduct mixed method research which is inclusive of mixed-model and mixed-methods research *designs* (Cameron, 2009; Saunders, Lewis & Thornhill, 2009; Ivankova, Creswell & Plano Clark, 2012). Mixed-model research presents superior research results compared to mono method research. Mixing qualitative and quantitative research approaches across the research stages gives the qualitative and quantitative paradigms equal status while giving one paradigm dominant status (Johnson & Onwuegbuzie, 2004). In this thesis, the qualitative paradigm was given the dominant status. The results of the quantitative analysis were converted into qualitative narratives (Saunders, Lewis & Thornhill, 2009). Mixed-model research further allows for the collection of quantitative and qualitative data sequentially or concurrently (Venkatesh *et al.*, 2013).

A multistage mixed-model research design, crossing paradigms, and time ordering of the quantitative and qualitative phases were used as the research covers multiple organisational disciplines (Buchanan & Bryman, 2007).

1.6.5 Sampling strategy

In this research study the snowball sampling technique was used in an attempt to select a sample representative of the IT population in the African Oil and Gas industry. The snowball sampling technique is a subset of non-probability sampling methods and is useful in business studies where the targeted population is difficult to find (Maree, 2012). For the purpose of this study the IT population in the African Oil and Gas industry was divided into three clusters namely the Chief Information Officers (CIOs) and IT Directors, C-level executives and general managers, and external service providers (ESPs), delivering IT services and products through an internal customer IT department. Snowball sampling was used to select representatives from each cluster to participate in the research. This approach was followed for both surveys and interviews. Convenience sampling was used in the latter part of the research study to test the finding drawn from the African Oil and Gas population with a group of CIOs and IT executives at the CIO Africa Summit, held at the Arabella Western Cape Hotel & Spa from 10 to 12 June 2014.

Section 3.7 provides more details on the sampling strategies applied in this research.

1.6.6 Data collection strategy

Saunders, Lewis and Thornhill (2009) list two primary research methods, namely *mono methods* and *multiple methods* (Fig 3.5). Mono methods focus on a single data collection technique and corresponding analysis procedure such as quantitative (numbers and statistics) and qualitative (interviews) methods. Multiple methods focus on multi-method research (combining more than one data collection technique, restricted within a qualitative and quantitative world-view using the corresponding analysis procedure only), and mixed method research (using quantitative and qualitative data collection techniques and analysis procedures at the same time). Mixed-model research is a subset of the mixed method research design which combines quantitative and qualitative data collection techniques and analysis procedures, converting either technique to be analysed using the dominant procedure (Tashakkori & Teddlie, 2003; Bergman, 2008; Saunders, Lewis & Thornhill, 2009; McMillan & Schumacher, 2010).

For this research, the **mixed-model** research approach was used to collect and analyse data, as it enhances the credibility of the study.

Semi-structured interviews, surveys, questionnaires and a workshop using Lewin's (1951) Force Field Analysis (FFA) theory were used as primary method of data collection for this research. Thomas (1985), Baulcomb (2003), Bozak (2003) as well as Card, Ward and Clarkson (2015) confirm the relevance and usefulness of FFA as a method of data collection in research projects. To support the interviews, observations conducted by the researcher added to the richness of the data. These observations enabled the researcher to see and hear things that participants were not aware of and were not willing to discuss. Three quantitative surveys (one conducted in the form of a workshop) and one qualitative survey (interviews) were used as data collection techniques respectively.

1.6.7 Data analysis

Using a mixed-model based research, quantitative and qualitative data collection techniques were combined, and interpreted, converted and analysed qualitatively (Johnson & Onwuegbuzie, 2004; Cameron, 2009; Saunders, Lewis & Thornhill, 2009). During the analysis process the data were categorised into manageable themes, patterns, trends and relationships to identify patterns and trends in the data to support the interpretation thereof (Mouton, 2011). Section 3.9 provides more details on the data analysis applied in this research.

1.6.8 Data validation and reliability

The research validity was ensured using the 'content validity' criteria to secure adequate coverage of the investigation questions and sub-questions guiding the questionnaires and interviews. The *unit of analysis* is representative of the targeted population. The non-probability snowball sampling method was used to select a random number of representatives from each of the clusters representing the IT population (Saunders, Lewis & Thornhill, 2009; Maree, 2012) in the African Oil and Gas industry. The research reliability was ensured using the 'internal consistency method', where every item is correlated with every other item across the entire sample and the average inter-item correlation is taken as the index of reliability. The transcribed interviews were given to the interviewees to confirm that the information and their replies, where applicable, were correct according to their intent.

1.7 CONTRIBUTION OF THE RESEARCH

There exists a limited amount of empirical research investigating the implementation of an effective and efficient IT department within a complex environment—the African Oil and Gas industry. According to Hofstee (2009) and Jansen (2012), the significance of research studies is the contributions they make to **theory** and **practice**. Research projects often contribute to methodological innovations introduced by the researcher when collecting research data.

The significance of the proposed research study is to make a contribution to the existing body of knowledge while proposing a framework for practical application in the solving of real-world problems to the benefit of the targeted industry, organisations and its people.

1.7.1 Theoretical contribution

According to Remenyi, Williams, Money and Swartz (2002), in business and management research economists distinguish between **value in use** and **value in exchange**. Value in exchange refers to the financial benefits the researcher could gain from undertaking the research. In contrast, value in use refers to the academic contribution the research will make to business and management while assisting professionals to obtain useful concepts and ideas to assist them in their daily work. Kilduff (2006:252) argues that:

"...the route to good theory leads not through gaps in the literature but through an engagement with problems in the world that you find personally interesting".

This research contributes to the body of knowledge as it is directed towards **value in use**. The research seeks to explore and understand the disconnect between traditional management theory and the way that IT implementation works in the African Oil and Gas

industry. The research explores the impact of culture, innovation and emotional intelligence on the implementation of IT in a complex economy.

1.7.2 Methodological contribution

When conducting research in the real world, it is important that the researcher is viewed as an independent actor striving to contribute towards making a theoretical and practical contribution to the body of knowledge. When confronted with organisational and personal shyness in business research, shyness could be overcome when treated as a symptom of research, a participant's fear of the unknown. When shyness is dealt with as a personality trait, it becomes an inhibitor of the research process (Scott, 2004).

Actors in the targeted population viewed the researcher as a potential threat and considered the research as a vehicle to gain access to strategic and confidential information. Through observations and the behaviour of the actors from the selected sample, the researcher observed that the seen (where the researcher is associated with his employer and its related business activities) cannot be separated from the unseen (where the researcher is seen as independent from his employer). To secure future participation where the researcher is an active member of the target population, research should be conducted in the name of the academic institution the researcher represents.

Mitigating the identified methodological gap in this research, a multistage mixed-model research design was followed, and triangulation was used to validate the relevancy of the primary research data collected from literature and a sample representative of the IT population in the African Oil and Gas industry with an IT population representative of all industries on the African continent (see Chapter Four, Stages III and IV).

1.7.3 Practical contribution

The study contributed to the existing body of knowledge, providing a framework for practical application in the solving of real-world problems to the benefit of the targeted industry, organisations and its people. The study *explored* the complexities of IT implementation; developed an *understanding* of the artefacts that lead to successful IT implementation; and identified the transformational requirements to *transform* the IT department from rigidity to agility in the African Oil and Gas industry. As stated in section 1.4, the research proposes a management framework to support the implementation of an efficient and effective IT department within organisations in the African Oil and Gas industry.

1.8 ETHICAL CONSIDERATIONS

Permission to conduct this research was obtained from the Research and Ethics Committee of the Faculty of Informatics and Design at the Cape Peninsula University of Technology. The benefits of the research were disclosed and assurance was given to all participants that participation was voluntary and that participation would be treated as confidential. Written consent was obtained from all individual participants, and where required, from their organisations.

Ethics: While conducting the research, the researcher understood the importance of maintaining ethical standards. These standards included but were not limited to personal gain and causing harm to a participant or a group of participants when publishing the findings of this research. According to Resnik (2011), the researcher needs to differentiate between acceptable and unacceptable behaviour when conducting research. In addition, the data collected through this research was used for the purpose of this study only.

Justice: According to Orb, Eisenhauer and Wynaden (2001), the researcher needs to ensure that no participant is abused nor exploited in any form, during or after the research. Therefore, the data presented by the researcher is a fair reflection of data gathered through the research. Participants gave their consent in writing to participate in the study. All questionnaires were signed by the participants, while the interviews were recorded, transcribed and returned to the participants for review.

Beneficence: Data collected and found to be irrelevant to this research, or data that could expose any of the participants or their companies, will not be disclosed. No data have been falsified to benefit the researcher or any of the participants.

Section 3.12 provides more details on the ethical principles and behaviour that directed this research.

1.9 RESEARCH ASSUMPTIONS

The following research assumptions underlined the research: ⁽¹⁾that the target population understood the research content; and ⁽²⁾that they co-operated and responded to the research in an honest and truthful manner.

1.10 DELINEATION AND LIMITATIONS

The study was conducted within the African Oil and Gas industry, limited to *exploring and understanding the disconnect between traditional management theory and the way that IT*

implementation works. The research will not deliver an IT blueprint or architecture framework for the Oil and Gas industry.

During the proposal phase of this study the researcher realised that, being an employee and CIO of a National Oil Company (NOC) on the African continent who are actively competing in the development of refining capacity while pursuing options to enter the African downstream market, might have been viewed by peers and International Oil Companies (IOC) as intimidating and a threat to their existence. As a result, some role players in the targeted population decided not to participate in the research. These role players were then excluded according to the ethical stance of this research.

1.11 CONCLUSION

In practice, traditional management theory is inadequate in leading business and IT management in the successful implementation of IT in the African Oil and Gas industry. As an enabler of business, weak IT implementations lead to poor relationships between business and IT while failing business in creating a competitive advantage.

The research *explores the disconnect between traditional management theory and the way that IT implementation works within the African Oil and Gas industry* to enable organisational leadership to plan the future for predictable success. The research also *explores* the complexities of IT implementation; develops an *understanding* of the artefacts that lead to successful IT implementation; and identifies the transformational requirements to *transform* the IT department from rigidity to agility.

A number of management theories have been developed during the past century. Although management thinking was only recorded since the beginning of the 19th century, the history of management dates back thousands of years. This study focuses on IT implementation and the development of organisational management and how to bring about sustainable change in actual behaviour. McGregor (1960:8) argues that every managerial act rests on assumptions, generalisations, and hypotheses—that is to say, on theory:

“...our assumptions are frequently implicit, sometimes quite unconscious, often conflicting, nevertheless they determine our predictions that if we do a, b will occur. Theory and practice are inseparable”.

Smit *et al.* (2011) and van der Colff (2013) confirm the existence of a gap in the interpretation and application of management theory in the African context and advise African leaders to develop the ability to integrate traditional and conventional management styles to resolve the unique challenges they are facing.

The research proposes a management framework to support the implementation of an efficient and effective IT department within organisations in the African Oil and Gas industry.

1.12 SUMMARY

IT leadership is blamed for being rigid and unable to service the evolving needs of their organisations. Theory gives what technical skills the IT department requires but does not mention what people skills are required. Many management theories have been developed during the last century. Although management thinking was only recorded since the beginning of the 19th century, the history of management dates back thousands of years. The implementation of an effective and efficient IT department remains problematic for business and IT management as traditional management theory does not necessarily support the implementation of IT within organisations in the African Oil and Gas industry. This research *explores the disconnect between traditional management theory and the way that IT implementation works within the African Oil and Gas industry.*

The researcher followed an *inductive* research approach as he based and built his theory on the analysis of the data collected through literature reviews, questionnaires and interviews. He is however not proclaiming to generalise the proposed theory and framework. The research was conducted in a social world where the research has to do with 'what' and 'why', and not what should be. The research paradigm fluctuated between *exploratory humanism* and *interpretivism*.

The following methodological considerations were followed by the researcher in this research study:

- i) Acknowledging that he entertains opinions and perceptions of the world he has explored, the researcher's **ontological** position is *subjectivism* and **epistemology** position that of *interpretivism* where reality is accessed through social construction by exploring the experiences of others.
- ii) A **mixed methods** research *approach* was adopted to utilise the benefits of both the quantitative and qualitative approaches.
- iii) The **snowball sampling** technique was used to select a sample representative of the IT population in the African Oil and Gas industry, while *convenience sampling* was used in the latter part of the research study to test the finding drawn from the African Oil and Gas IT population.
- iv) Data were collected through interviews, questionnaires and a workshop using Lewin's (1951) Force Field Analysis (FFA) theory.

- v) The validity and reliability of data were confirmed using the **content validity** criteria to ensure adequate coverage of the investigation questions and sub-questions.
- vi) The ethical standards from the Research and Ethics Committee of the Faculty of Informatics and Design at the Cape Peninsula University of Technology were complied with. Written consent was obtained from all individual participants and where required from their organisations. Interviews were recorded, transcribed and returned to the participants for review.

In Chapter Two the researcher provides an in-depth literature review and analysis of management theory and its impact on the implementation of IT within a complex economy such as the African Oil and Gas industry.

1.13 STRUCTURE OF THE THESIS

This thesis comprises of five chapters. Chapter One provides an introduction and rationale for the study. The research problem and the purpose of this study are explained. The research questions are stated, followed by an overview of the methodological considerations, the research contribution, ethical considerations, underlying assumptions, and the delineations of the study.

Chapter Two provides an in-depth literature review and analysis of management theory and its impact on the implementation of IT within a complex economy such as the African Oil and Gas industry. The literature relevant to the artefacts for successful IT implementation such as emotional intelligence, practical intelligence, people, culture, business and IT alignment models, enterprise architecture (EA), and strategic partnership, is discussed.

Chapter Three presents the research design and methodology applied in the study. An overview of the research philosophy, delineating the ontological, epistemological and axiological assumptions, is provided. An overview of various research paradigms is provided and the research approach adopted in this study is discussed. Data collection and data analysis strategies are described, as well as the trustworthiness and ethical considerations of the study.

Chapter Four presents the findings that emerged from the data collected from representatives of the IT population (Chief Information Officers and IT Directors, C-level executives and general managers, and external service providers) in the African Oil and Gas industry using questionnaires and semi-structured interviews. The research findings are analysed and discussed, taking into account the literature, conceptual framework and research questions.

Chapter Five presents conclusions and recommendations resulting from this study. Limitations of the study and recommendations for future research are also provided.

CHAPTER TWO: LITERATURE REVIEW

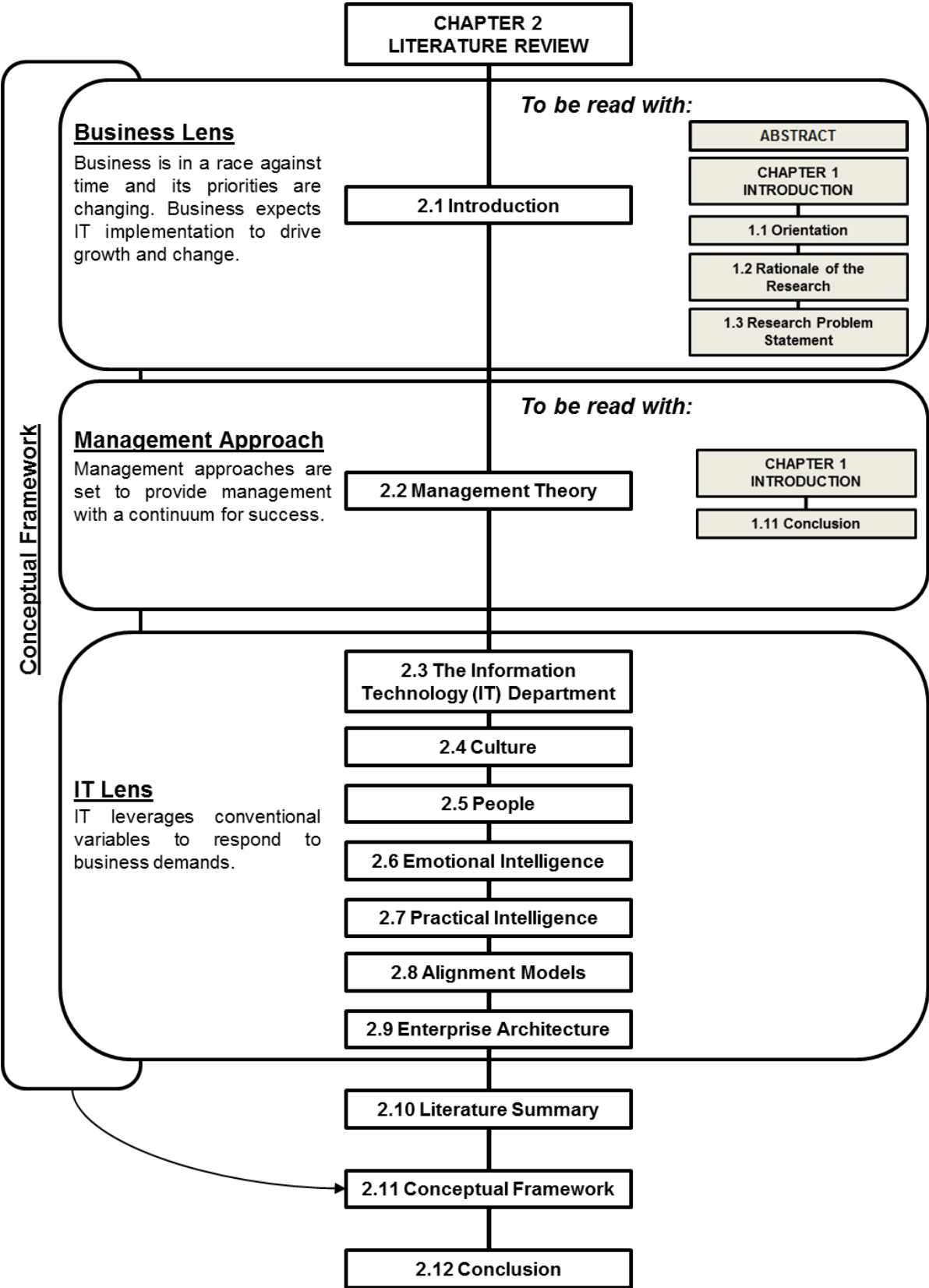


Figure 2.1: Chapter Orientation

2.1 INTRODUCTION

Globally, the energy sector is fast nearing a tipping point of no turning back, transitioning from fossil fuel to renewable energy. This transition holds both threats and opportunities for IT. As an enabler of business, business expects IT to support, grow and maintain their existing portfolio of IT products and services while at the same time innovate and build new IT competencies to respond rapidly to the transition towards renewable energy (Nelder, 2014). IT is further challenged to assist business to reduce their operational cost as the cost of producing oil far exceeds the rising oil prices. The Wall Street Journal (Gilbert & Scheck, 2014) reports that oil and gas production by Chevron, ExxonMobil, and Shell has declined during the past five years.

According to the International Energy Agency (2012), the Oil and Gas industry is risky, highly political and wildly expensive. It is also critical for every person on the planet. It fuels nearly every other industry in the world, from agriculture to information technology (IT). Oil and gas heat our homes, power our vehicles and help grow our food. The global energy demand is expected to grow by more than 33% by 2035, with most of that energy being supplied by oil and gas.

Africa is a continent rich in natural resources. However, the continent is in economic, political and social crises with the majority of Africans living in poverty. According to Ayittey (2005), African leaders have failed Africa. Most African countries are becoming known in the global market for their high volumes of oil and natural gas reserves. Recent estimates by the World Bank predict that:

“...by 2020 only four or five African countries will not be involved in mineral exploitation” (Chuhan-Pole *et al.*, 2013:13).

Threatened with civil and regional conflict, the northern parts of Africa have a well-established oil industry with large downstream activities (refer to the **Glossary of Terms**). However, oil production is overlooked in Western Africa although they too have a large oil and gas reserve.

Through infrastructure development and technology improvement programmes the World Bank and the International Monetary Fund are attempting to change the African oil sector. While upstream oil activities are concentrated in Southern and Eastern Africa, including Kenya, Ethiopia, Sudan, Madagascar, South Africa, Tanzania and Uganda, other local governments are seeking international partners to tap into their oil and gas opportunities.

Once these oil and gas reserves become mainstream it can put Africa in the spotlight. To put Africa in the spotlight, good governance is needed to harness the full potential of such natural resources. An article in the African Pulse states that the African oil industry lacks governance, accountability and management mechanisms (Chuhan-Pole *et al.*, 2013).

According to Adrian Schofield, Vice Chairman of the Africa Information & Communication Technologies Alliance (AfICTA), in "*eLearning: Ethiopia, Kenya and Beyond*", the failure of technology in African schools is due to the unreliability of electricity and communications infrastructure on the continent (Cave, 2014). However, according to Cave (2014), the biggest barrier is not necessarily electricity and communication, it is human fears that technology might take over their jobs and that they might not be able to learn how to use the technology, thus making them redundant.

GDP growth across the world is driven by the ICT industry, from developing countries such as India to developed nations such as the United States of America. Not only does ICT contribute to economic successes, it advances people's skills and capabilities and positions global firms to do business more efficiently. The ICT sector is further socially and economically relevant to Africa in that it has been an economic driver in Sub-Saharan Africa over the past decade (Andoh-Baidoo, Osatuyi & Kunene, 2014).

The World Bank and the African Development Bank highlight the role of ICT in Africa to enhance regional trade and the export potential of African companies to the international markets (Yonazi, Kelly, Halewood & Blackman, 2012). ICT is considered key to economic and social development in developing nations (Andoh-Baidoo, Osatuyi & Kunene, 2014). Yonazi *et al.* (2012) report that Africa's ICT trade performance is weak compared to other world regions. Within Africa, ICT trade accounts for only 10% of the total African trade. This suggests a missed opportunity for economic growth. The ICT industry in Africa provides jobs and educational opportunities which will lead to a healthier society and economy (Andoh-Baidoo, Osatuyi & Kunene, 2014).

Although mobile and internet penetration remains comparatively low in Africa, the population and continent is well connected at an elementary level (Calandro, Stork & Gillwald, 2012). Although the African ICT financial predictions remain positive, the continent is still challenged with insufficient access to ICT services and still lags behind the rest of the world in terms of ICT readiness. The International Telecommunications Union (ITU) Development Index indicates that Africa made slower progress compared to other regions over the two years leading up to 2011 (Figure 2.2).

While the price of voice services in Africa remains competitive it is more expensive than other developing nations. At the same time broadband costs continue to rise beyond the

reach of most Africans. Mobile penetration is four times higher than the internet. According to Ernst and Young (2011), in Africa Attractive Survey, Africa's position as an ICT investment destination has improved.

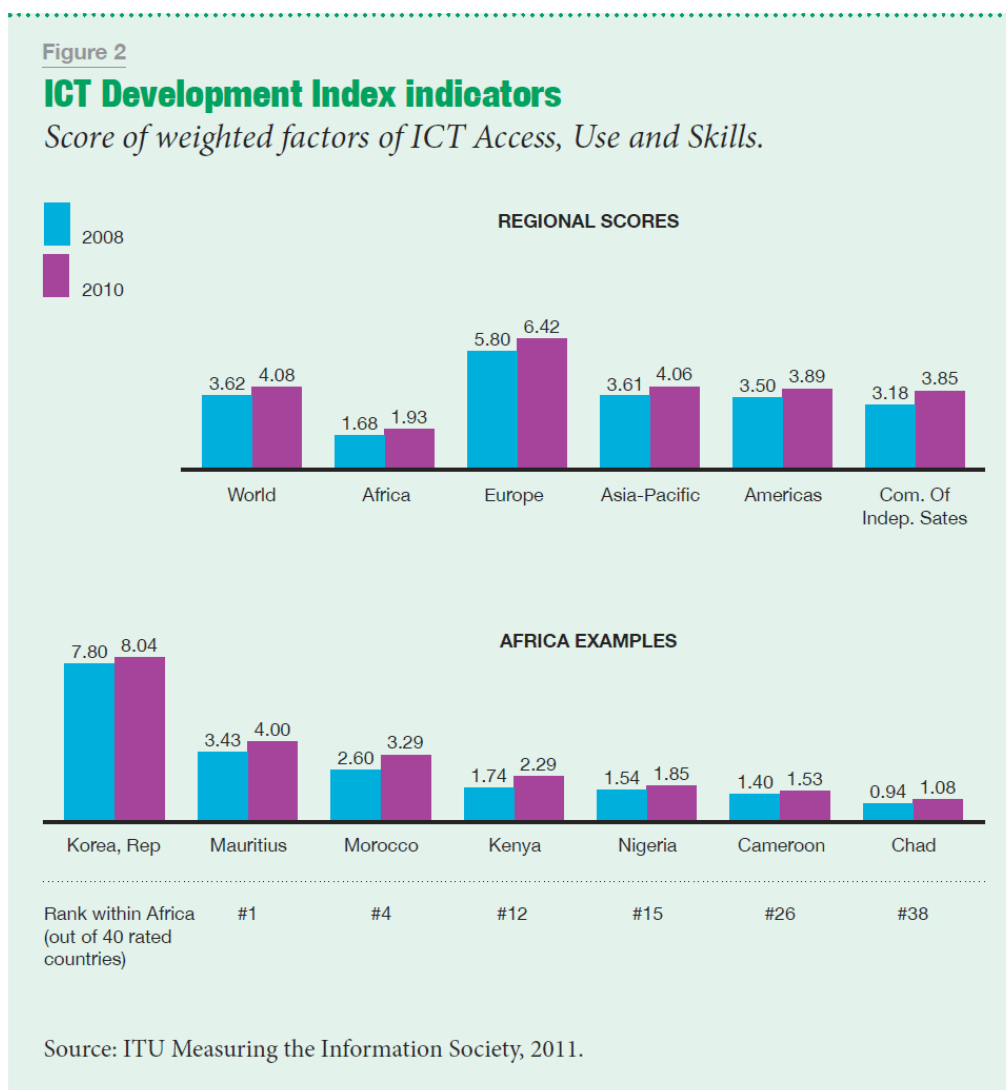


Figure 2.2: ICT Development Index – Africa
(Yonazi et al., 2012:149)

To capitalise on the ICT investment opportunities continent wide, African leaders need to increase the industrialisation of the ICT industry while encouraging the sharing of proven solutions across the continent. Focus should be directed towards the establishment of ICT infrastructure, addressing energy constraints and closing the ICT skills gap across the continent. To sustain and grow the ICT sector, Africa needs to reduce the cost of access for mobile and broadband, support government and private-sector collaboration, improve ICT worker skills levels, and create ICT infrastructure to meet the continental developmental demands.

According to the annual activity report published in February 2014 by the UK Oil and Gas Industry Association Limited trading as Oil and Gas UK, the number of exploration wells drilled in the United Kingdom and North Sea is down with 44 wells in 2013 compared to the number of wells drilled six years ago, production cost has increased by 15% from the same period 12 months ago, while the average extraction cost per barrel of oil was up by 27% compared to the same period a year ago. With exploration levels resulting in a less than 30% success rate, the Oil and Gas industry finds itself in its biggest challenge in 50 years (The UK Oil and Gas Industry Association Limited trading as Oil and Gas UK, 2014).

According to Beckett (2014), drilling decisions have been made on limited information. As a result, new IT capabilities such as big data and organisational intelligence that have the ability to provide more certainty in exploration decisions are needed. With an aged generation of oilmen retiring it could further assist bridging the skills shortage while introducing and facilitating the induction of a younger generation into the industry. While the aforementioned factors create a platform for IT innovation management to position IT as an enabler of business and to serve as a medium to create competitive advantages, the implementation of IT remains problematic for business and IT management while IT leadership is blamed for being rigid and unable to service the evolving needs of their organisations.

In this chapter, the existing literature that relates to the research problem statement, research questions and research aims are reviewed.

The problem statement: The implementation of an effective and efficient IT strategy by an IT department within a complex environment remains problematic for business and IT management as traditional management discernment does not necessarily support the implementation of IT within organisations in the African Oil and Gas industry.

The research questions:

- 1) What are the complexities of IT implementations within organisations?
- 2) Why do IT professionals find it difficult to respond to the demands of business in a traditionally managed environment?
- 3) How do organisations deal with the complexities of IT implementation?

The aims: To *explore* and *understand* the disconnect between traditional management and the way that IT implementation works and to explore and understand the driving forces behind the successful implementation of IT in a complex environment such as the African Oil and Gas industry.

Traditional management, literature relevant to the artefacts for successful IT implementation such as emotional intelligence, practical intelligence, people, culture, business and IT alignment models, EA, and strategic partnership, are discussed. To do this, several important database search engines were accessed using the following keywords: traditional management, business and IT strategic alignment, emotional intelligence, practical intelligence, people, culture, business and IT alignment models, EA, and strategic partnership. Database search engines such as Cambridge Journal Online, EBSCOhost, Emerald, Google Scholar, IEEEExplore Digital library, Nexus, Proquest, ScienceDirect, Scopus, and Wiley Online Library were used to optimise the literature review. Books such as *“The making of South Africa Inc.: unlocking South Africa’s global potential”* (Dorrian, 2005), *“Strategic management: Southern African concepts and cases”* (Ehlers & Lazenby, 2007), *“Management principles: a contemporary edition for Africa”* (Smit et al., 2011), *“Leadership on the African Context”* (Van Zyl, DalGLISH, Du Plessis, Lues & Pietersen, 2013), and *“Leadership: the power of emotional intelligences”* (Goleman, 2011a), to name but a few, contributed to the richness of the literature reviewed.

2.2 MANAGEMENT THEORY

Leadership and management studies can be traced back to the formation of societies (Griffin, 2002; Shonhiwa, 2006). According to Trewatha and Newport (1982) and Griffin (2002), management activities such as planning, organising, controlling and directing were practiced by the Egyptians when they build the 1st pyramids.

With the fast changing and complex environment businesses operate in, management of not only people but also business processes, information, technology and innovation becomes more and more important. In the following section, the history of management theory, traditional management theory, leadership in Africa, management styles in the Gas and Oil industry in Africa as well as technology versus management theory, are discussed.

2.2.1 The history of management theory

According to Plato, the nature of a relationship is found in love and friendship (Scruton, 2002). Through friendship we seek to improve ourselves and help others to improve. Aristotle, a student of Plato, describes human nature as “the good to which all things aim” (Vanier, 2001:2). Smith (1723-1790), a Scottish moral philosopher, postulates that:

“...the accumulation of private property to promote self-interest and social wellbeing provided stability” (Scruton, 2002:223).

This shift from human relationships to individual gain influenced the development of the theory of bureaucracy. Bureaucracy suppresses human behaviour through a command and control system for the gain of a few, which is the opposite of Aristotle's philosophy. Marx adds to Smith's theory that human nature is informed by social activities, which Marx defines as labour, customs and (financial) institutions (Scruton, 2002).

In the 1900s, the Western economies were transformed by the industrial revolution and the capitalist society emerged, characterised by authority, rules, procedures and achievement. Two dominant management approaches emerged, namely the classic approach and the contemporary approach.

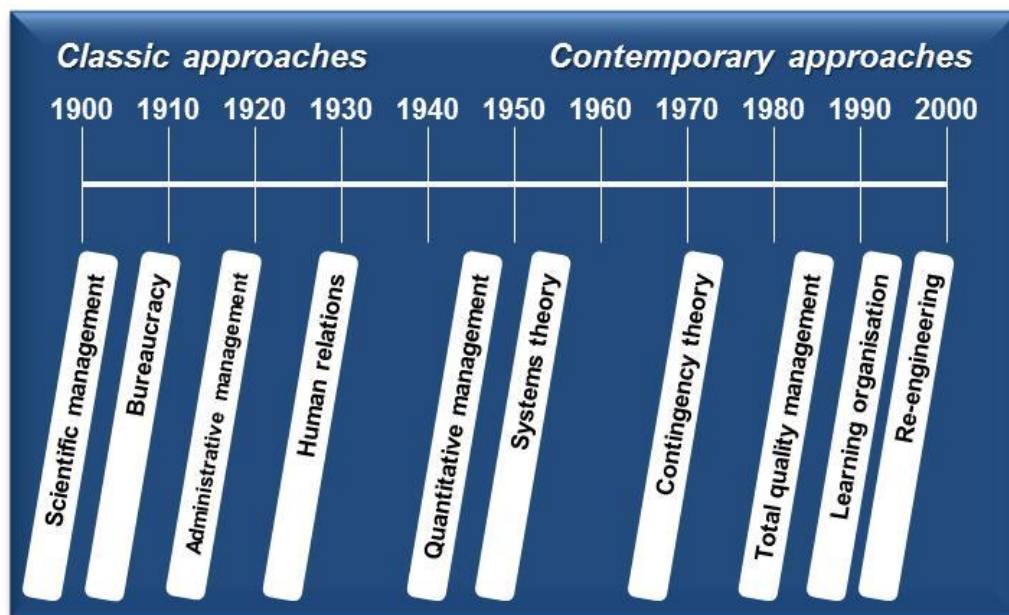


Figure 2.3: The evolution of management theory
(Smit et al., 2011:32)

As illustrated in Figure 2.3 by Smit *et al.* (2011), the *Classic Management Approach* of the late nineteenth century to early 1950s focuses on internal business functioning such as scientific management which is based on the 'only one best way' theory of Tylor (1856-1915). Weber (1864-1920) describes management by bureaucracy as structure, rules and regulations. Classical management also includes administrative management (plan, organise, lead and control to improve productivity), introduced by Fayol (1841-1925). Emphasis is placed on human relationships where management is focused on workers, groups and processes to resolve productivity problems. Kwok (2014) supports Smit *et al.* (2011) by arguing that traditional management theory can be categorised into three main branches, namely bureaucratic management, administrative management and scientific management theories, which were developed during the 19th century. Traditional

management theories were directed to motivate workers to improve their efficiency and effectiveness.

Literature recognises Frederick W. Taylor (1856-1915) as the father of scientific management, while Henri Fayol (1841-1925) is recognised as the father of modern management (Alika & Aibieyi, 2014; Gupta, Chhetri & Gupta, 2014; Bell, Kennebrew & Blyden, 2015). Fayol's administrative management school of thought is considered as the most influential contributor to modern management (Alika & Aibieyi, 2014). Taylor (1911) developed the scientific management approach of improving work methods by studying and analysing human behaviour to increase output. Taylor argues that paying employee's higher wages will motivate them to work harder.

The scientific approach was followed by the bureaucracy approach to management. Weber (1864-1920) argues that the bureaucracy approach sustains organisational efficiency by exercising authority over human beings (Augustine & Agu, 2013). Managers operate within a fixed set of management principles to achieve their corporate objectives. In discharging their responsibility, managers are held accountable for both the successes and failures in their area of responsibility. They are further entrusted with the safety of the resources assigned to them to ensure that they are optimally utilised. As Fayol noted, managers instruct organisational resources to achieve related goals and objectives (Kwok, 2014). As a result, employees were commanded and controlled by management to increase productivity and were seen not to be trusted. This did not only violated human rights, but ignored social and environmental concerns such as pollution. The principle of command and control increasing productivity was found not to be true. Instead, it was found that there are psychological reasons that motivate people to work harder. In 1996, Jack Welch became renowned for eliminating bureaucratic structures inside organisations (Welch, 1996).

As businesses grew, management realised that the complexities of running their organisations stretched beyond worker productivity. Fayol argued that managerial activities are unanimous with any human driven institution which led to his conclusion that there are five administrative functions to business management called planning, organising commanding, coordinating and controlling (Smit *et al.* 2011).

Following the 1930's depression, the behavioural science or human relations approach emerged. According to Maslow (1943), workers had many individual needs such as safety and self-actualisation, to name but a few (Figure 2.4).

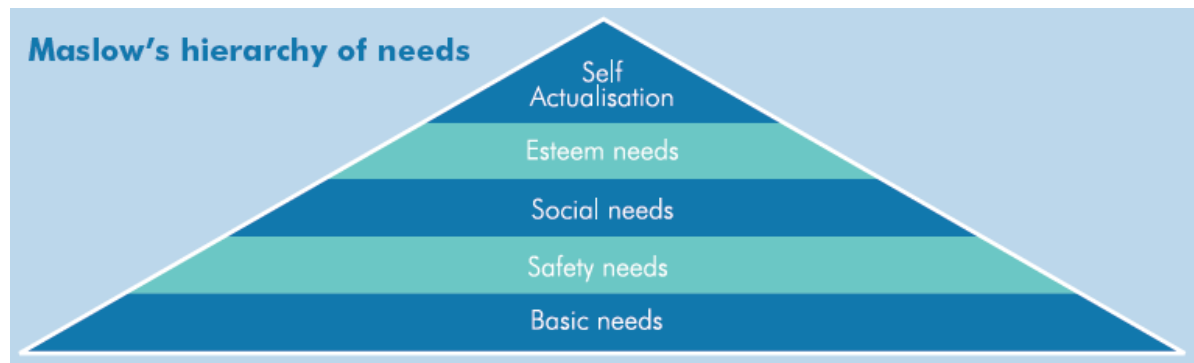


Figure 2.4: Maslow's hierarchy of needs
(Maslow, 1943)

Douglas McGregor (1906-1964) found that managers fall into one of two types: *Theory X* or *Theory Y*. Theory X managers feel that workers are naturally lazy and dislike work, are motivated only by money and avoid responsibility, and want to be directed. Theory Y managers feel that workers enjoy work, are motivated by a range of factors such as esteem, that workers like to make their own decisions, and are ambitious (McGregor, 1960).

In his book, "*The human side of enterprises*", McGregor (1960) challenged the scientific management approach. In Theory X, the assumption is that people are driven by rewards, thus, they will only perform if they are punished and rely on bureaucratic controls to be effective whereas in Theory Y, people are motivated by the challenges presented by their work and could be directed and managed by their own behaviour. Theory Y is seen as the 'soft side' of management while Theory X maximises shareholder wealth and operational efficiencies through rigid controls.

The *contemporary management approach* dates back to the 2nd World War, presenting some overlap with the *classical management approach*. The contemporary management approach formed the foundation of management as we know it today and includes quantitative, systems theory, contingency theory, total quality management, learning organisation, and re-engineering approaches. The introduction of computers and mathematical techniques to resolve management problems lead to the concept of quantitative management. Quantitative management combines classical management theory and behavioural science to make informed decisions (Ayhan & Oztemel, 2014). Systems theory views the organisation as an open system and not as a series of unconnected parts (Cummings & Vorley, 2013). Any change in the system influences the other parts of the system. The contingency approach suggests that no single management approach exists and that alternative management approaches need to be considered to meeting the requirements of the situation.

After World War II, Deming (1982) travelled to Japan to assist the Japanese to rebuild their economy. In 1979, Deming's work was broadcast on American television and total quality

management (TQM) became the driver of the American industry. Deming (1982) promoted a participative management style. Total quality management has since been adopted worldwide. TQM introduced continued improvement as a means to review and improve quality.

In the 1990s, Peter Senge (1990) introduced the *learning organisation*, fostering a culture of lifelong learning, mental models, shared vision and organisational dialogue, and the high performance organisation emerged. Lawler (1996:22) defines six principles of a high performance organisation: ⁽¹⁾organisation is the ultimate competitive advantage; ⁽²⁾involvement is the most efficient form of control; ⁽³⁾all employees must add significant value; ⁽⁴⁾lateral processes are key to organisational efficiency; ⁽⁵⁾organisations should be designed around products and customers, and not functions; and ⁽⁶⁾effective leadership is key to organisational success. Organisations have since (re)engineered their processes to become high performing organisations which are driven by customer centricity. This was followed by a re-engineering approach to reinvent the organisation to meet the changing macro socioeconomic demands (Kwok, 2014).

In closure, management should be observed as a science (driven by various principles), a profession (something that can be learned), and an art (different approaches based on experience). An organisations management approach should be viewed against the dominant cultures of their time (Smit *et al.*, 2011).

In their book, "*The end of management and the rise of organisational democracy*", Cloke and Goldsmith (2002:4) state that:

"Autocracy, hierarchy, bureaucracy and management are gradually being replaced by democracy, flat, collaboration and self-managing teams. Permanent, stockpiled, one-size-fits-all policies are giving way to innovative, just-in-time, evolving, made to order initiatives. Silos and competitive departments are being deconstructed into living evolving webs of association. Isolated, cynical, immature, apathetic employees are being transformed into connected, motivated, value driven, responsible employee owners".

Wang, Waldman and Zhang (2014) emphasise the importance of self-managing teams to improve team dynamics and organisational effectiveness.

2.2.2 Defining management

Follett (1868-1933) defines management as "getting things done through people" (Follett, 1941; Kwok, 2014:34) while Pearce, Robinson and Mason (1989) describe management as

the process of optimising human, material, and financial contributions for the achievement of organisational goals.

Management is defined by Nicholas (1990:21) as:

“...the combined effort of planning, organising, leadership, and control to accomplish the organisational goal”.

Nicholas (1990) adds a fifth function namely change as an element of continuous improvement. He argues that management has to do with the achievement of organisational goals through the integration of resources and tasks. As an open system, an organisation should be adaptive to changing internal and external environmental forces.

Wehrich and Koontz (1993) argue that management is the process of designing and maintaining an environment in which individuals can work together in groups to accomplish organisational objectives. Management has to do with the managerial functions of planning, organising, staffing, leading and controlling. Management is concerned with productivity (creating wealth) and to improve efficiency and effectiveness, and applies to all organisations (both profitable and non-profitable).

Managing an organisation involves planning, organising, directing and controlling (Hellreiegel, Jackson, Slocum, Staude & Associates, 2001). Hellreiegel *et al.* (2001) argue that management functions differ based on the different managerial levels in an organisation. Therefore, the managerial scope of a manager at the lower end of the organisation is narrow, whereas the managerial scope of a manager serving on the executive committee is broader.

Olum (2004) argues that management refers to the development of governance that derives its importance from the need for strategic planning, co-ordination, directing and controlling of large and complex decision making processes. Management entails the acquisition of managerial competence and effectiveness in the areas of problem solving, administration, human resource management, and organisational leadership.

Shonhiwa (2006) states that management is a tactical operation, where the manager will make use of available resources to achieve the organisation's objectives. Management focuses on planning, monitoring, controlling and organising to achieve organisational goals.

Originated during the industrial revolution, Kwok (2014) argues that traditional management theory can be categorised into three main branches, namely bureaucratic management, administrative management and scientific management, which were developed during the 19th century. Traditional management theories were directed to motivate workers to improve their efficiency and effectiveness.

As already indicated, literature recognises Frederick W. Taylor (1856-1915) as the father of scientific management, while Henri Fayol (1841-1925) is recognised as the father of modern management (Alika & Aibieyi, 2014; Gupta, Chhetri & Gupta, 2014; Bell, Kennebrew & Blyden, 2015). Fayol's administrative management school of thought is considered as the most influential contributor to modern management.

Fayol describes management to be different from those functions performed in finance, production and marketing (Smit *et al.*, 2011). Fayol argues that management has to do with five basic administrative functions: planning, organising, commanding, coordinating and controlling (Figure 2.5).

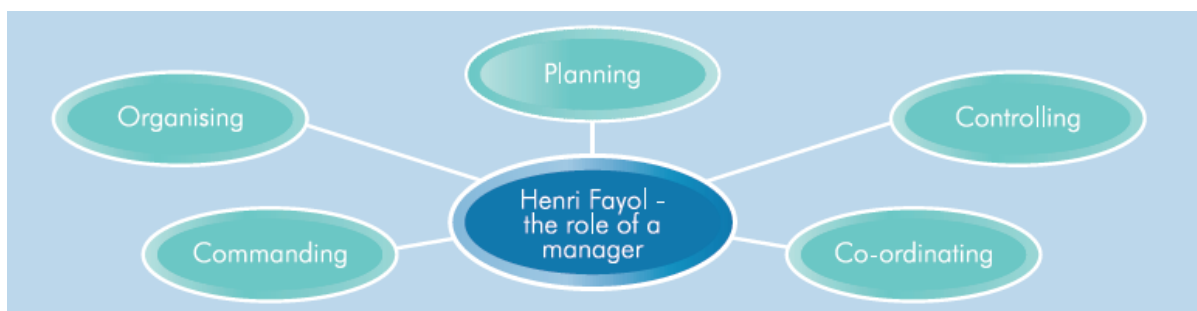


Figure 2.5: Henri Fayol – the role of a manager
(OPITO, n.d.)

Planning is looking ahead and setting objectives for staff; organising is the coordination of staff to achieve the set objectives; commanding is the art of leading and giving instructions to workers; coordinating is the grouping of activities to bring the organisation together for greater efficiency; while controlling is the measure of ensuring that the plan has been executed and that the objectives has been met.

Authors of management literature agree that the business world is changing (Van Zyl *et al.*, 2013; Smit *et al.*, 2011; Valocchi, Juliano & Schurr, 2014; Wang, Waldman & Zhang, 2014; Harmon, 2014). In the 19th century companies were run and managed by self-appointed none-corporate entrepreneurs and entrepreneurial capitalists. Business complexities necessitated these institutions to become more structured with shareholders, suppliers of capital, and a need for professional managers. With the introduction of corporate governance the owners could no longer manage the organisation themselves. These changes required managers to develop new competencies to ensure future business success (Hellreiegel *et al.*, 2001; Ehlers & Lazenby, 2007; Agha, Alrubaiee & Jamhour, 2012; Chouhan & Srivastava, 2014).

To advance in management, it should be observed as a science (driven by various principles), a profession (something that can be learned), and an art (different approaches

based on experience). Success is not determined by a single management best practice or theory. Leaders should assess each situation separately, acknowledging the dominant cultures and values of the region and community when choosing the preferred cause of action. Smit *et al.* (2011) and van Zyl *et al.* (2013) are making a positive contributing to management transformation in the African context. In the foreword of the book, “*Leadership in the African context*” by van Zyl *et al.* (2013:iii), Professor Jonathan Jansen, rector of the University of the Free State, concludes that:

“...the knowledge and wisdom on leadership contained in its pages will reach students and leaders well beyond the borders of South Africa”.

Smit *et al.* (2011) argue that business managers in Africa need to develop the ability to integrate traditional and conventional management styles (i.e. planning, organising, leading, controlling) to resolve the unique challenges they face. These challenges include but are not limited to workforce diversity, employment equity, trade unions, industry charters, globalisation, mobile workforces, competition, and shorter product lifecycles.

2.2.3 Management theory in the African context

The changing global economy has increased competition among African countries, forcing governments and organisations to rethink their management approach to reach their potential (Van Zyl *et al.*, 2013). Van Zyl *et al.* argue that humanity needs to return to the centre of organisational management. Facing many challenges such as HIV-Aids, poverty and corruption, African leaders are reconsidering their adoption of the Western world’s management styles, philosophies and mentalities (Ehlers & Lazenby, 2007; Smit *et al.*, 2011; Van Zyl *et al.*, 2013; Amadi & Ekekwe, 2014; Enu-Kwesi, 2014). These styles ignore the African cultures and values, leading to mistrust which creates a feeling of inferiority and fear among the African people. More than before African leaders and organisations realise that they need to develop their own management philosophies based on the strengths of their heritage, culture, experience and potential.

Africa is dominated by corruption, self-enrichment, autocratic leadership styles and leaders that enforce decisions on employees without consultation or giving them the option of choice (Manz, 2001; Amadi & Ekekwe, 2014; Bruce, 2014; Enu-Kwesi, 2014). Multiple control systems are used to drive decisions and employees to achieve autocratic goals. This approach is not sustainable and leads to employee frustration and unhappiness. Instead, Manz (2001) proposes that leadership considers an alternative approach of internal self-control where employees are given the option to become co-owners of the organisational goals and take responsibility for their own actions. Mahoney and Thoreson (1998) argue that employees who apply self-leadership can better direct and correct their own performance,

while Lawler and Rhode (2000) promote the importance of organisational control systems to control operational standards and employee behaviour, and emphasise the importance of employee performance and reward systems. To maximise organisational efficiency and effectiveness, self-leadership theories and corporate control systems should be combined to design and implement a single control system, inclusive of strategy formulation, culture, and values, to direct organisational and individual performance (Carver & Scheier, 1981; Mahoney & Thoreson, 1998).

According to Manz (1986), Manz and Simms (2002) and Manz and Neck (2004), self-leadership is a philosophy and a systematic set of actions and strategies for leading oneself to a higher performance and efficiency level. Manz (2001) argues that self-leadership encourages and motivates employees to perform tasks that are less inspirational and uninteresting.

According to Houghton and Neck (2002: 672), self-leadership is:

“...a process where employees discover their individual strengths and developmental areas to motivate themselves and others to achieve their objectives”.

By identifying the developmental areas, individuals can maximise their own and the organisational abilities for greater efficiency, effectiveness and self-control. Williams (1997) indicates that there is a relationship between self-leadership and the emotional state of a person. It determines the individual's ability to handle stress, work under pressure, being innovative and creative in resolving business challenges. Dolbier, Soderstorm and Steinhardt (2001:3) support the views of Williams. Houghton, Neck and Singh (2002) argue that conscientiousness involves competence, orderliness, dutifulness, strive for achievement, self-discipline and deliberation. Elloy (2004:55) found that employees “exposed to self-leadership development are healthier”, while van Zyl (2007:8) states that it “leads to happier and better performing employees”.

Companies who foster a culture of innovation and creativeness among their employees show sustainable control over their operational cost, while providing higher quality services and producing new products faster (Grobler, Warnich, Carrel & Elbert, 2006). These companies are also more adaptive to business and technology changes. Self-leading individuals are found to be more dedicated to their organisations and goals than their colleagues who do not subscribe to the principles of self-leadership and self-motivation (Manz & Simms, 2002; Wang, Waldman & Zhang, 2014). Employee commitment further leads to a higher level of satisfaction and trust between the employer and employee (Houghton & Neck, 2002).

2.2.4 Management challenge in Africa

The lack of control over the challenges faced by Africans leaves them powerless and uncertain. African leaders, managers and employees need to empower themselves, become emotionally strong, learn to be creative and committed while breaking their dependence on the Western world. Self-leadership is a method of empowerment and building trust. It restores self-respect and self-worth while overcoming anxiety and uncertainty. Self-respect instils a feeling of control and autonomy, striving to set and fulfil own goals rather than being controlled by external forces (Houghton & Yoho, 2005).

The term *management* as the word is presently used is an American invention (Drucker, 2009; Van Zyl *et al.*, 2013). In other parts of the world, not only the practice but the entire concept of management may differ. The understanding of the theory in this context may deviate considerably from what is considered normal and desirable in the United States of America (Hofstede, 1999:81).

It is important to unleash the power and potential of people by means of effective leadership and management for the greater good of the organisation (Blanchard, 2007). In his book, “*On leadership*”, published in 1990, Gardner defines the role of a leader as among others the ability to envisioning goals, motivating, managing, achieving unity, serving as an example, explaining and renewing (Van Zyl *et al.*, 2013).

Although intertwined, leadership and management each have their own set of characteristics. Leadership sets direction (Gaunt, 2006) and involves having a vision of what the organisation can become through a process of continuous change (DuBrin & Dalglisch, 2003). According to Leonard (1999), managers are responsible for implementing the organisational vision through its existing resources, i.e. people, finances, processes and technologies. Gaunt (2006) confirms that management uses existing principles and values to direct their resources to meet the organisational goals. Reiling (2007) emphasises the role of management in changing the organisational culture as demanded by the socioeconomic and environmental factors facing the organisation.

In Africa, leaders need to focus on the challenges facing the business environment (Shonhiwa, 2006; Van Rensburg, 2007). Shonhiwa (2006) identifies that Africa has the following environmental characteristics: the need for cross-cultural management and leadership skills; the need for inter and intra country demand management across the continent; the need to integrate the various cultures; an understanding of the subtle cultural distinctions in each country and the sensitivity surrounding these cultures; and the need for the development of an emerging management style that differs from those taught in business

schools and applied in multinational corporations to address the African continental challenges.

Shonhiwa (2006:37) argues that African managers can improve their efficiency and success if they:

“...ensure consultation on all issues, exercise patience backed by cultural knowledge, use a people-oriented approach to problem solving, be eager to learn new things, be decisive and assertive, have knowledge and understanding of life circumstances in the broader society, be a visionary, practice open communication and maintain transparency, recognise diversity, and strive to drive unity”.

With the majority of Africans still living in poverty (Ayittey, 2005; Barrett, Little & Carter, 2008; Carmody, 2012; Dulani, Mattes & Logan, 2013), growth on the continent is hindered by the adverse geography and lack of infrastructure regardless of its richness in natural resources (such as coal, oil and gas) and human talent. Poverty implies lower governmental income through taxation. Lower taxation leads to the appointment of under qualified civil servants that contributes to poor governance and an increase in corruption (Amadi & Ekekwe, 2014; Bruce, 2014; Enu-Kwesi, 2014). Corruption leads to self-centeredness and the enrichment of the few, with a further degradation of infrastructure and services. Speaking at the Young African Leadership Forum at the University of Johannesburg on Friday 4 April 2014, Thuli Madonsela said that “as a country South Africa could cover more ground if it wasn’t for maladministration” (Madonsela, 2014).

Africa leaders, and specifically leaders in the African Information and Communications Technology (ICT) industry, need to join hands to effectively plan and integrate the continent through the use of technology to bridge the digital divide that exists between Africa and the developed countries (Gumbo, Jere & Terzoli, 2012; Watkins, 2012; Deen-Swarray, Moyo & Stork, 2013).

ICT has a pervasive impact across the spectrum of development at all levels of society, ranging from individual to major industries (Soper, Demirkan, Goul & St. Louis, 2012; Wresch & Fraser, 2012; Deen-Swarray, Moyo & Stork, 2013; Carayannis, 2014). Connecting Africa through the establishment of quality communication networks inclusive of mobile and broadband networks which is economically viable remains a priority to: ⁽¹⁾connect citizens with policy makers to improve quality of life across the continent; ⁽²⁾commit political leaders to develop Africa responsibly; ⁽³⁾raise awareness at all levels concerning the impact of climate change in a developing economy; ⁽⁴⁾building sustainable capability and infrastructure; and ⁽⁵⁾improve governance that is capable of managing financial resources responsibly (Gumbo, Jere & Terzoli, 2012; Watkins, 2012; Deen-Swarray, Moyo & Stork, 2013).

ICT plays a crucial role in addressing macro socioeconomic challenges. Delivering sustainable IT services at all levels of society is therefore only possible if the underlying infrastructures are available. Human talent is an essential component in the provisioning of sustainable ICT products and services. Not only should organisations develop IT talent, but also create job opportunities to alleviate poverty (Horváthová & Davidová, 2012; Lake, 2013).

2.2.5 Management theory in the Oil and Gas industry

The Oil and Gas industry provides for a variety of management layers within many types of organisations covering the Oil and Gas value chain. Management competencies and responsibilities include exploration, drilling, production, trading, marketing, human capital, finance and IT, to name but a few. A variety of management styles are used in support of the management context. Leadership is directed towards safety, health, environmental and quality factors. Setting a safety climate requires a higher emphasis on risk management in reducing environmental, health and safety incidents to avoid fatalities (O’Dea & Flin, 2001; Reader & O’Connor, 2013). Contrary to management evolution, an autocratic management style is still being used in the Oil and Gas industry where decisions are made without consultation or input. It is largely necessitated in matters of safety and adherence to the Minimum Industry Safety Standards which deal with the safety and well-being of everyone on board an offshore oil and gas installation. As implied by Reader and O’Connor (2013), rules and procedures must be followed to assure safety. Tveiten, Albrechtsen, Wærø and Wahl (2012) cite the need to develop intelligent operations in the Oil and Gas industry to promote corporate governance.

2.2.6 Technology vs. management theory

As the pace of technological changes accelerates, it is hard to know which technologies will become the next game changer. What is known is that technology has a disruptive impact on all industries, which increases business risk (Maurer & Lechner, 2014). IT is constantly challenged to identify the support capabilities needed to execute the business plan, and to respond timely to the ever changing socioeconomic environment, now and in the future. According to Nelson (2006), Madni and Jackson (2009), and Dreischmeier, Lawecki, Deutscher and Arcuri (2014), the IT department needs to ensure it maintains capabilities that are sufficient and flexible to allow their organisations to thrive and not just survive. It has become essential for organisations to invest in retaining strategic technical capabilities while acquiring business acumen to meet their business objectives.

A study performed by the Boston Consulting Group in collaboration with the Innovation Value Group assessed data collected from CIOs between 2010 and 2014. The study identified five pain points topping the list of challenges faced by the IT department, namely: capacity

forecasting and planning; total cost of ownership; EA management; benefit assessment and realisation; and innovation management. Benefit realisation ensures that IT projects impact the business positively by enhancing the current and future business models to grow alternative revenue streams (García-Muñiz & Vicente, 2014).

Innovation management expands beyond technology and focuses on driving game changing business models, products and services and forms the foundation of value creation (Brynjolfsson, 2011). Markets are driven by consumer behaviour which directs the speed of business and technology changes across all industries. In Africa innovation is critical for survival and attacking foreign markets. The 2014 Boston Consulting Group and Innovation Value Group study notes that CIOs are less concerned about budget oversight and the funding of IT initiatives and more concerned in meeting the business transformational requirements (Dreischmeier *et al.*, 2014). These observations are crucial as it highlights the importance of the evolution of management theories and the fact that traditional management theory on its own is not sufficient for the IT department to meet the demands of business.

2.3 THE IT DEPARTMENT

Since the early 1980s the rate of adopting IT services and products increased in both the social, private and commercial sector. Information has become and is a key resource for all enterprises (ISACA, 2012). Compliance with legislation requires structured governance to manage the end-to-end information lifecycle (King III, 2009; ISACA, 2012; Government Gazette, 2013). Technology plays an important role in the protection of information and the quality of information to support decision making.

King III (2009), Brooks (2011) and ISACA (2012) highlight the importance of IT as an enabler of business to meet the business strategic goals and objectives, while setting a platform for business to create a competitive advantage. Chapter 5 of the King III (2009) report addresses the governance of IT. King III assigns the Board of Directors the responsibility to govern and align IT with the business strategic objectives, while optimising the IT assets of the organisation to create wealth (King III, 2009). For business and IT to collaborate and work together, IT needs to be built into the business model and be made part of the business management and governance structures (ISACA, 2012). In addition, IT needs to lead business innovation through process (re)engineering and the application of emerging technologies to make existing business services and products more compelling to customers, while creating new channels to expand and reach new customers (ISACA, 2012).

Given the above, the relationship between business and the IT department continues to deteriorate as IT professionals tend to focus more on technology than on the requirements of

the business users they are servicing. Business argues that IT is an intruder who imposes new ideas and work practices on them. The result is poor business and IT alignment, ineffective governance and management of the IT assets, while creating a culture of mistrust between business and IT. Grindley (1991a) argues that culture is a variable which determines the maturity levels and quality of the relationship between business and the IT department. In a study conducted with IT Directors, Grindley (1991b) concludes that a cultural gap stripped companies from gaining a competitive edge from the use of IT products and services as a business enabler. The situation is further prolonged by a business belief that IT only has a supporting function and is therefore not a direct contributor to the success of the organisation. Legislation is increasingly being passed to address the governance and management of IT assets to meet corporate goals and objectives (ISACA, 2012).

2.3.1 The positioning of the internal IT department within the parent company

Living in a digitised world, business depends on external IT services providers such as suppliers of products, services and goods, consultants, cloud and other service providers for business success (Valtakoski, 2015). As an enabler of business, it is no longer sufficient for the IT department to just be aligned with the business; IT needs to be an integral part of the business strategy, structure, policies, processes and people (King III, 2009; Brooks, 2011; ISACA, 2012). Apart from providing the services recorded within the business IT service catalogue, the IT department needs to act as the service aggregator (refer to the **Terms of Reference**) and conduit between business and the external service providers (ICT industry) (Figure 2.6).

The placement of the IT department within the organisational structure should reflect the strategic importance of the IT function towards the achievement of the business objectives while securing management commitment and governance (Van Grembergen & De Haes, 2010; ISACA, 2012). Following the appointment of a dually qualified Chief Information Officer (CIO), the Board of Directors should formally delegate the CIO's responsibilities, while the reporting line of the CIO should be commensurate with the importance of IT within the company (Van Grembergen & De Haes, 2010; ISACA, 2012).

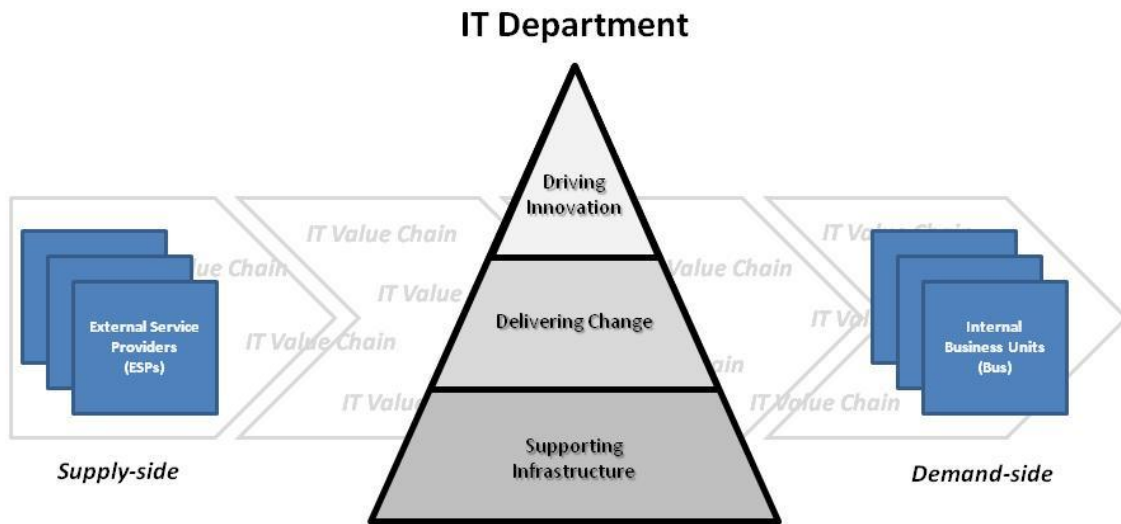


Figure 2.6: IT Service Aggregator Model

2.3.2 Strategic vendor management

Transactional sales of products present challenges for both the IT department and the external service providers (ESPs) (Spekman & Carraway, 2006). Contracting (Williamson, 1979) and benefits realisation of services proved to be difficult to assess prior to purchasing (Jackson, Neidell & Lunsford, 1995). The IT department often relies on intuitive assessment of the offer and trusts the ESP to deliver the contracted services and value (Valtakoski, 2015). Sheth and Shah (2003) argue that the nature of the purchase is determined by the IT department's preference between a transactional or collaborative relationship with the ESP. Cannon and Perreault (1999) conclude that the importance and complexity of the service has a direct impact on the IT department and ESP relationship. Spekman and Carraway (2006) and Penttinen and Palmer (2007) support Cannon and Perreault's (1999) theory and add that the lifecycle and economic importance of the solution result in the IT department and ESP relationship to shift from transactional to relational. According to Grönroos (2008) and Vargo and Lusch (2008), transaction-oriented purchasing changed from products to partnerships, services and value based selling (Anderson, Kumar & Narus, 2008).

Wilson (1995) found that a clearly defined purpose, expectations for the proposed relationship and a set of norms are important elements for the selection of an ESP-partner. Spekman and Carraway (2006) and Penttinen and Palmer (2007) found that the unique characteristics of the service have a defined impact on the nature of the relationship. Successful relationships between the IT department and the ESP develop over a longer-term (Vargo & Lusch, 2008). Grönroos and Helle (2010, 2012), argue that a business relationship is based on the alignment and matching of business processes between two companies. Wilson (1995) lists a number of factors the IT department should consider before entering

into an ESP relationship. These factors include the ESP's reputation, trust, mutual goals, performance, commitment (Morgan & Hunt, 1994) and the ability to communicate (Duncan & Moriarty, 1998). Claycomb and Frankwick (2010) confirm that communication and conflict resolution have an impact on the ESP's reputation.

Complicating the formation of strategic ESP relationships with the IT department is the complex nature of defining a service. Zeithaml, Parasuraman and Berry (1985:33) argue that services "cannot be seen, felt, tasted, or touched in the same manner in which goods can be sensed". The value of a service can only be determined once it is in use, which confirms the importance of factors such as trust, communication and reliability of the ESP in the formation of the IT department and ESP relationship. The less the IT department knows about the service characteristics, the riskier the service is perceived by IT. Matured services are less risky due to standardisation and the IT department's knowledge. Thus, the higher the risk, the more reliant the IT department is on the ESP, which increases the IT department's dependency and need for trust in the ESP (Gao, Sirgy & Bird, 2005). Without risk there is no need for trust (Moorman, Zaltman & Deshpande, 1992). The ESP needs to demonstrate its trustworthiness (integrity, credibility and willingness) to the IT department (Blois, 1999; Johnson & Grayson, 2005; Schoorman, Mayer & Davis, 2007). Trust in the IT-ESP relationship reduces conflict (Anderson & Narus, 1990), increases commitment (Morgan & Hunt, 1994), and fosters long-term relationships (Anderson & Weitz, 1989). Claycomb and Frankwick (2010) tested the impact of trust on relationships and found that it varies during the different phases of the relationship lifecycle.

A key characteristic of a sustainable IT-ESP relationship is the ability and willingness of both parties to continuously adapt (Brennan, Turnbull & Wilson, 2003). Anderson, Kumar and Narus (2008) and Guenzi, Georges and Pardo (2009) note the importance of the ESPs to adapt their approach and offering towards the needs of the IT department (Román & Iacobucci, 2010). Brennan and Turnbull (1999), Brennan, Turnbull and Wilson (2003), and Schmidt, Tyler and Brennan (2007) further note that relationship adaption is mostly made by the ESP. Giacobbe, Jackson, Crosby and Bridges (2006) found that if the ESP sales process can adapt to accommodate the IT department's buying process, they can strengthen the relationship. Corsaro, Fiocca, Henneberg and Tunisini (2013) confirm that business relationships can create business value. However, Viio and Grönroos (2014) found that investments made in one relationship are not transferable to another relationship due to the nature and uniqueness of each relationship.

The formation of strategic relationships between the IT department and the ESP is aimed at working together towards a common goal for the good of the IT department's parent

company. Conversely, if the parties are not committed to the common goal, a transaction-oriented approach is justified.

2.4 CULTURE

Schein (1985:9) defines culture as:

“...the adoption of a set of universal solutions to external problems endangering survival over time which was passed on from one generation to another”.

Culture is a process of continuous evolution which applies to continents, regions, nations, ethnic groups, organisations, professionals or any combination thereof. Understanding the different characteristics of cultural diversity in Africa is a key competency to be developed by African leaders (Van Zyl *et al.*, 2013). Smit *et al.* (2011) argue that organisations each have their own culture. Organisations are built with people, each with their own moral and ethical values, beliefs, goals and expectations. It is the sum of these factors that forms the corporate culture. Smit *et al.* (2011:259) define corporate culture as “the beliefs and values shared by people in an organisation”.

Hofstede (1999) states that management is not a set of universal principles, therefore, what works well in one culture might not work in another. Takeo Fujisawa, the cofounder of the Honda Motor Company, said that “Japanese and American management practices are 95% the same, and differ in all important respects” (Schneider & Barsoux, 1997:73).

People around the world have different views of the world and different expectations. According to Trompenaars and Hampden-Turner (2002), cultures are changing all the time as people’s needs for survival change. Similarly, macro socioeconomic pressures on the organisation require the continuous adaption of the organisational strategy to survive (Smit *et al.*, 2011). Cultural changes are therefore influenced by leadership but cannot be demanded by leadership.

Transformational leadership aspires to shift from meeting individualistic objectives and needs towards meeting those of the group (Burns, 1978; Parnell, 1988; Roueche, Baker III & Rose, 1989; Eddy, 2007; Hussein, 2014). Since a nation consists of multiple groups, it progresses towards meeting its communitarianism requirements. In a communitarian culture, people achieve in a group and share responsibility. In individualistic cultures, individuals are seen as the achiever and assume personal responsibility. Where communitarian cultures are dominant, a leader gains his or her status from the group.

In African companies, the workforce varies from literate to illiterate, requiring different management and communication styles to create synergies between the workforce,

communities and goals of the organisation, which is often seen to be in conflict with the dominant culture (Van Zyl *et al.*, 2013). Improving organisational performance requires continuous change. Mistrust, fear, and a lack of teamwork and leadership skills cause the employees to resist change. Leadership must take action to overcome employee resistance to change and act timely for the good of the organisation, its employees, and its stakeholders (Smit *et al.*, 2011).

As Africa tries to break loose from its past, marked by poverty and corruption, many of the modern structures adopted are an imitation of the Western culture (Van Zyl *et al.*, 2013:51), ignoring the lessons learned from the past and the Ubuntu principle. Most of these structures were developed by individuals and organisations that do not understand the cultural or practical nature of life for most Africans. Development across the broader spectrum is only realisable if understood as a developmental process in the cultures of the African people (Prah, 2005). African leaders need to learn from developing countries without trying to copy them by building their own models on existing cultures and values to promote sustainable development through the opportunities offered by globalisation.

According to Thurow (1999), success is created by the adoption and creation of new rules to break from the past. Technologies such as the *Internet of Things* and *Cloud Computing* create new rules and open new opportunities for Africans as it removes geographical limitations (Robb & Sutton, 2014; Graham, Andersen & Mann, 2015).

According to van Zyl *et al.* (2013), cultural diversity affects and determines the beliefs and behaviours of an individual or group. Ignorance of cultural diversity leads to misunderstandings which threaten the peace and the socioeconomic prosperity of affecting nations. To be an effective leader in Africa, an understanding of the African culture is a necessity as it directs the context within which leadership occurs.

Leadership in Africa is experiencing difficulties managing the dimensions of multiculturalism in the corporate environment. Due to the sensitivity surrounding the subject, organisations are afraid to acknowledge cultural differences (at an employee level) and the impact it has on productivity, efficiency and effectiveness. Corporate culture is used as an equaliser that can be controlled by leadership. Creating a cooperative environment for sharing allows the diverse cultures within the organisation to interact and learn from each other. This will improve organisational efficiency, productivity and innovation (Finestone & Snyman, 2006).

2.5 PEOPLE

Defined by age, sex and language, no two people are the same. Smit *et al.* (2011:337) argue that it is far more difficult to ascertain a person's EI, intellectual capacity, personality, learning

experience, perceptions, values, attitudes and motivation. For organisations to succeed, they require leaders with sound people knowledge to direct and motivate employees to work as a team towards the achievement of the organisational goals. To remain competitive, innovative and open to change, organisations should pay attention to personality traits, leadership traits, employee development, leadership development, talent management and teamwork when recruiting new talent or developing existing staff.

2.5.1 Employee development

DuBrin, Dalglish and Miller (2006) and Solansky (2014) conclude that education, experience and mentoring are important activities for life and work development. In the context of this study, employee development relates to transformation of IT as an enabler of business.

2.5.1.1 Education

Academic learning is the accumulation of knowledge without practical experiences (Bentley, 1998; Speight, Lackovic & Cooker, 2013). Education provides an avenue for leaders and employees to improve their own effectiveness and that of the business through the accumulation of knowledge. Knowledge gathering is a continuous process. Organisations with knowledgeable employees and leaders lead to better informed decisions and innovative problem solving.

2.5.1.2 Experience

Employee efficiency is complimented by on-the-job training, generally referred to as work experience. Based on the research of McCall (as cited in DuBrin, Dalglish & Miller, 2006), the best experiences for individual development are those that challenge the individual realistically. McCauley, Moxley and van Velsor (1998) propose that providing employees with challenging opportunities in the workplace is an effective way of preparing them for the future. Growth is synonymous with continuous learning, choices, decisions and failure in a controlled environment. DuBrin, Dalglish and Miller (2006) conclude that setting the right goals and defining the criteria for success are effective ways to develop talent; organisations should encourage their employees to work towards these goals.

Hughes, Ginnet and Curphy (2006) identify that work associates and the task itself have a direct impact on the development of an individual. Work associates have both a positive and negative effect, and this contributes to the development process. Task execution assists with the development of effective and innovative problem solving.

According to Raskas and Hambrick (1992), multifunctional development is a method to develop experience. It is an effort to enhance organisational effectiveness by exposing

employees to multiple functions. Multifunctional development provides employees with experience and learning in a broader spectrum and will assist IT professionals to acquire the business acumen needed to serve their respective industries and organisations.

For organisations to survive in a changing environment they need to develop and run company-wide change management programs to continuously transform employee behaviour and corporate culture (Beer, Eisenstadt & Spector, 1990). Beer *et al.* (1990) argue that change is the biggest obstacle faced by business leadership. To stimulate employee growth, organisations can use change management programmes such as leveraging job rotation to gain experience in order to transfer lateral skills and competencies to employees.

2.5.1.3 Mentoring

Mentoring is a method to fast-track the process of transferring experience and business acumen by assigning an experienced and knowledgeable coach to an employee. Formal mentoring is a widespread practice where organisations assign a mentor to an employee—often during the onboarding process—to assist the employee to adapt his or her behaviour with the organisational culture, values, goals and processes. Studies conducted by Ragins and Cotton (1999) and Cotton, Miller and Ragins (2000) found that employees who received informal mentoring were more effective than their peers who were assigned formal mentors. These employees reported that they did not only receive career and job coaching from their informal mentors, but emotional and social support as well.

Informal mentorship relationships are based on similarities (i.e. goals, personality, ambitions, etc.) between the employee and the mentor. In a formal mentorship program the organisation matches the employee with a mentor. Formal mentors are therefore often less motivated than informal mentors as the relationship seldom develops beyond that of a work relationship. From the research of Ragins and Cotton (1999) and Cotton, Miller and Ragins (2000), it seems that employees with career ambitions who understand the value of interpersonal skills are more likely to attract their own mentors inside and outside of the organisation to reach the top faster.

2.5.2 Personality traits of leadership

Effective leaders are emotionally well-developed and understand the value of relationships and the importance of bidirectional communication. Individual leaders create trust among their followers and embrace diversity to build consensus. Bennis (1999) as well as Schroeder, Bahn-Henkelman and Henkelman-Bahn (2012) indicate that effective leaders possess different personal qualities. DuBrin, Dalglish and Miller (2006) list self-confidence, warmth, trust, assertiveness, enthusiasm, emotional intelligence, courage, flexibility and

adaptability as important qualities of a leader. Petrock (2007) argues that emotional intelligence is an important quality for both leader and follower and that training and development can improve an individual's level of emotional maturity. Petrock further argues that the level of emotional maturity sets individuals apart.

2.5.3 Leadership development

Leadership is the ability to respond to different situations authentically and spontaneously. Leaders need to be open to their followers and be respectful to the environment in order to rise to new levels of understanding and insight, addressing and facing the macro socioeconomic challenges of the real-world. As a problem solver, a leader requires analysis and problem solving skills.

Leadership and teamwork excel the health and performance of an organisation. Leadership helps employees excel and grow to achieve more with and through others. As times change, the human race evolves, the economic climate becomes more challenging, and environmental challenges increase the expectation for leadership to change. Companies are looking for leaders that can outthink their competition. To stay competitive, organisations need to break with historical structures and mindsets that were largely controlled by power play, intimidation and manipulation, exercised through command and control.

An environment of command and control ruins personal relationships while employees see themselves as powerless, and is normally associated with higher levels of resignations. True leadership fosters a culture of responsiveness, flexibility, accountability, safety and optimum learning as important factors for support. Research indicates that when knowledge workers are given the freedom, they become more creative and entrepreneurial. Van Rensburg (2014) indicates that an organisation which understands modern-day leadership is differentiating itself from those who still practice the old-fashioned command and control tactics. Part of being a good leader is to be tolerant of the ideas of those being led in order to be effective in helping them become better organisational citizens, rather than forcing opinions of what the leader knows is right.

Good leadership fosters ethical behaviour and corporate governance (Avey, Wernsing & Palanski, 2012; Shin, 2012). Transformational leadership provides open feedback and is not afraid of addressing issues that hinder organisational growth while promoting teamwork (Zhu, Newman, Miao & Hooke, 2013). Teamwork improves personal effectiveness, with higher levels of commitment, accountability, morale, energy, focus, productivity, willingness to take responsibility and innovativeness, which benefit the whole company (Baiden & Price, 2011; Nelsey & Brownie, 2012). A better designed strategy, performance management tool or operational tactics cannot replace a strong leadership culture. Poor organisational

performance is seldom a lack of knowledge, skills or experience. Instead, it is the result of leadership inability to establish, maintain, control and align the corporate culture. Ignoring own egos and agendas, leadership should focus on the organisation, its greater cause and promoting its employees. Poor character is when leaders put their own interests before those of the team and organisation.

Leaders should encourage innovation and creativity while expecting people to make mistakes (Dyer, Gregersen & Christensen, 2011; Vaccaro, Jansen, Van den Bosch & Volberda, 2012). The aim is to keep on encouraging employees even after failing to find solutions to present business challenges. Developing employees is rewarding and provides the employee with a sense of urgency and purpose. For sustainability, leaders need to instil a culture of continuous learning.

Changing organisational mindset, attitude and behaviour calls for increased levels of emotional intelligence across the enterprise. Goleman (1998), states that self-awareness forms the cornerstone for awareness of others, self-regulation, and regulation of interpersonal relationships. Creating a leadership culture is best when developed from within the organisation by identifying individuals who already have a positive influence on the organisation, individuals who are passionate about and loyal to the company. Individuals who support each other grow the organisation and have the ability to motivate others to deliver sustainable results faster for the organisation. These employees have the ability to lead themselves and others, to direct their commitment, creativity and innovation towards servicing the organisational goals (Manz & Simms, 2002; Wang, Waldman & Zhang, 2014).

2.5.4 Talent management

Learning organisations get the right people onboard with the right mix of emotional intelligence, intellectual qualities, experimental learning and business acumen (Dreiling & Recker, 2014). Building a winning team is a continuous journey and not a destination (Senge, 1990; Cocks, 2014). Taking advantage of market opportunities is often dependent on the timely onboarding of experienced human talent and skills. Finding talented and experienced resources remains a challenge for most organisations across the world.

Organisations need to recognise the need for change whilst striving for operational excellence (Dreiling & Recker, 2014). Developing new capabilities will create a competitive advantage for the business and acquire new skills (Schilke, 2014) for deploying and managing new technologies. Organisations need to grow their expertise and knowledge across all spheres of the business so as to nurture world class operational processes (Mell, Van Knippenberg & Van Ginkel, 2014). To do this, business in conjunction with IT (King III, 2009) needs to develop a holistic workforce strategy and programs to effectively attract and

retain talent in order to remain competitive and deliver on its mandate as set out by its shareholder (Mitsakis, 2014).

When an organisation has a skills gap (significant gap between its capabilities and expertise), the organisation has reached a point where it no longer can grow or remain competitive as it has lost the ability to attract and fill critical jobs with employees who have the right knowledge, skills and abilities (Sitek, 2012). Elkeles and Phillips (2006) describe the impact of not having a fully prepared workforce as catastrophic to any organisation. They further explain that an unprepared workforce reduces profits, impedes market share, creates inefficiencies, lowers morale and increases attrition, which ultimately affects the quality of the company's service offerings.

A survey by the American Society for Training and Development (2012) conducted on its members, reports that 84% of participants indicated the existence of a skills gap in their organisation; 6.4% said no; and 9.6% did not know. These results were compared with the results of their 2009 study where 79% of participants indicated the existence of a skills gap in their organisation—confirming that the skills GAP is widening. Even though the aforementioned survey is an overseas assessment, the situation appears to be similar or even worse in South Africa. The Sowetan published an article which highlights that a substantial percentage of youth want to leave South Africa. In a period of only three months the number of young South Africans wanting to emigrate increased by nearly 50%. Those expressing a desire to leave are mostly young people whose skills are desperately needed in South Africa (Sowetan LIVE, 2012).

Auguste, Lund, Manyika and Ramaswamy (2012) highlight the fact that it is no longer enough to just employ smart people and develop their knowledge and skills. The lack of business knowledge and governance is responsible for up to 80% of project failures in organisations (Kovach & Mariani, 2012). Strategy formulation, execution oversight, governance and control are elements of business acumen focusing on the provisioning of direction to the organisation on the fulfilment of its mandate (Jiang & Carpenter, 2013; Bulley, Baku & Allan, 2014). Creating competitive business advantage through the enhancement of business practices is dependent on the accumulated business acumen of the organisational resources through a process of idea conceptualisation (Chan, Fung & Chien, 2013; Bulley, Baku & Allan, 2014).

The new rules call upon IT as an enabler of business (Brooks, 2011). Business expects IT to support, grow and maintain its existing IT portfolio while building new business capabilities to respond to the changing business environment (Nelder, 2014). This requires alignment between the business and IT strategies and relationships, developing a shared vision for IT

and the business (De Haes & Van Grembergen, 2015). Researchers agree that alignment between IT and business creates business value and growth through the investment in IT-enabled business solutions (Vargas, Boza, Cuenca & Ortiz, 2012; Trienekens, Kusters & Cuenca, 2014; De Haes & Van Grembergen, 2015).

2.5.5 Teamwork

In a competitive world, organisations lack the ability to unite their employees to collaborate as a unified team (Wang, Waldman & Zhang, 2014). Murphy and McMillan (2013) challenge leadership perspectives on teamwork and provide useful ideas on how effective team leadership can be implemented. They argue that there are many I's in teamwork and that these I's are the stitches that hold high-performing teams together. Teamwork generates synergies among the individual members, and these synergies provide a competitive advantage.

A team using an interdependent and consensus process (Bergman, Rentsch, Small, Davenport & Bergman, 2012) for decision making and problem-solving is more likely to explore options with an open mind, thus creating new insights. When teams brainstorm, applying their intellectual qualities, emotional intelligence and work experiences, they are likely to generate multiple solutions to a problem. Murphy and McMillan (2013) argue that teamwork neutralises the position with interest. Interest presents what the team has in common, such as a joint vision. Position presents the conclusions made based on assumptions, often without consultation, on how to neutralise a problem. The latter is a contributor to low staff moral and decreased corporate performance. High-performing teams use interdependent systems-thinking to unite cross-functional boundaries, aligned in shared vision and united as one (Bennis, 1989; Covey, 1989; Gardner, 1990; Kotter, 1990; Conger, 1990; Gardner, 1997).

2.6 EMOTIONAL INTELLIGENCE

Emotional Intelligence (EI) is the ability to manage the emotions of self and others by identifying one's own feelings and that of others to motivate and build relationships.

In the 1990s, EI was introduced by Salovey and Mayer (1990). The term was used to describe an individual's ability to know, handle and manage his/her own emotions and the emotions of others. Since then the interest in EI grew, with Goleman (1995) taking a leading role in exploring its power and applying it to improve workforce efficiency while the need for management to control employee behaviour in the workplace increased. The importance of EI in management theory can be linked to Henri Fayol (1841-1925) who worked as the managing director of the Commentry Fourchbault Mining Company from 1888 to 1918.

Fayol's work shows that the performance of employees improves when they feel that their needs are met (Trewatha & Newport, 1982).

Salovey and Mayer (1997) argue that by managing EI, the manager can direct the behaviour of involved parties according to situational needs. Kaluzniacky (2003) supports this theory with his argument that a manager can unleash the potential and generate more energy from his employees if he has a better understanding of their personality, behaviour and thoughts. According to Jordan, Ashkanasy, Hartel and Hooper (2002), teams with high EI operate at higher levels of performance. According to Maree and Elias (2007), emotionally intelligent people tend to perform better in many aspects of life than people who are less emotionally intelligent. Maree and Elias (2007) cite studies by Handley (1997) and Bar-On, Handley and Fund (2005) which show that there is a relationship between EI construct and workplace performance.

Goleman (1995) identifies *Social and Emotional Learning* or SEL as an effective tool to develop EI competencies by programming a person's brain through a process of repetition. The study resolved that students exposed to the learning of EI abilities at school have a higher leadership potential from mid-leadership through to high-level business executive management.

Various EI models are available. For the purpose of this research, the researcher focused on three models only, each presenting a different focus and purpose. The Salovey and Mayer's (1997) model focuses on intelligence shaped by the work done on IQ over the past 100 years. The Bar-On (2006) model is based on Bar-On's own research and focuses on a person's well-being. The Goleman (2011a) model focuses on the modelling of competencies that set star performers apart from average performers.

The EI models by Salovey and Mayer (1997), Bar-On (2006) and Goleman (2011a) best address the research problem and research question(s). These models are discussed in the following section.

2.6.1 Salovey and Mayer

Mayer and Salovey (1997:401) define EI as:

“...the ability to perceive and express emotion, assimilate emotion in thought, understand and reason with emotion and regulate emotion in the self and others”.

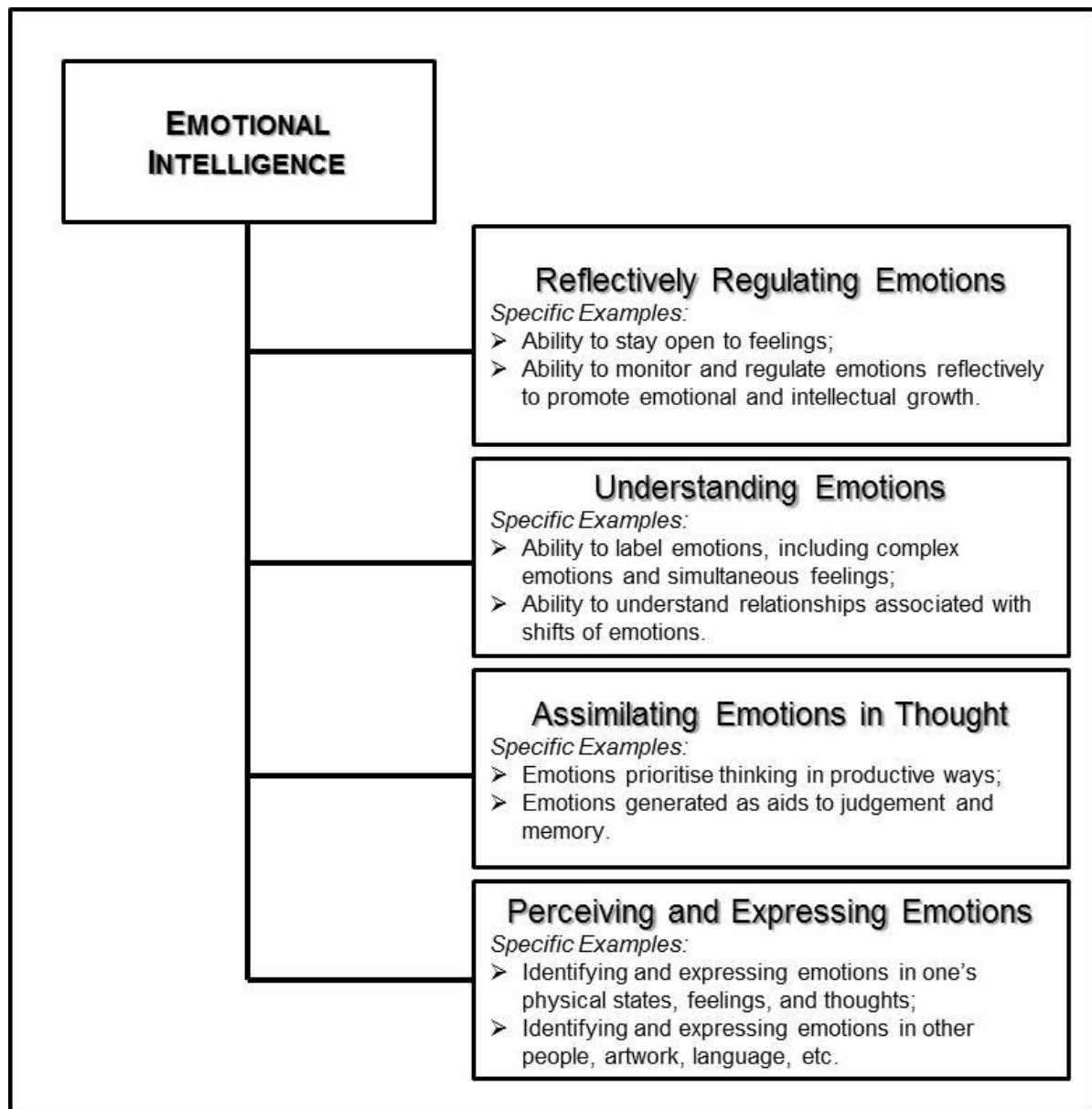


Figure 2.7: A four-branch model of the skills involved in emotional intelligence
(Mayer & Salovey, 1997:11)

Mayer and Salovey's (1997) EI model notes the relationships between emotions and cognition, and a person's behaviour and subsequent decisions (Figure 2.7). The model further highlights the possibility that a person's behaviour and actions can be modified to meet situational requirements.

In a research paper, Mayer, Caruso and Salovey (2000) conclude that EI is an important element when determining intelligence. They further argue that EI has a greater impact in the successful outcome of a decision than those taken without considering it. EI directs leaders to take decisions that are beneficial for the organisation and the wellbeing of the employees (Agarwal & Chaudhary, 2013).

2.6.2 Bar-On

Bar-On (1997:16) defines EI as:

“...an array of non-cognitive capabilities, competencies and skills that influence one’s ability to succeed in coping with environmental demands and pressures”.

EQ-I SCALES	THE EI COMPETENCIES AND SKILLS ASSESSED BY EACH SCALE
Intrapersonal	Self-awareness and self-expression
Self-regard	<i>To accurately perceive, understand and accept oneself</i>
Emotional self-awareness	<i>To be aware of and understand one’s emotions</i>
Assertiveness	<i>To effectively and constructively express one’s emotions and oneself</i>
Independence	<i>To be self-reliant and free of emotional dependency on others</i>
Self-actualization	<i>To strive to achieve personal goals and actualize one’s potential</i>
Interpersonal	Social awareness and interpersonal relationships
Empathy	<i>To be aware of and understand how others feel</i>
Social responsibility	<i>To identify with one’s social group and cooperate with others</i>
Interpersonal relationships	<i>To establish mutually satisfying relationships and relate well to others</i>
Stress management	Emotional management and regulation
<i>Stress tolerance</i>	<i>To effectively and constructively manage emotions</i>
<i>Impulse control</i>	<i>To effectively and constructively control emotions</i>
Adaptability	Change management
Reality-testing	<i>To objectively validate one’s feelings and thinking with external reality</i>
Flexibility	<i>To adapt and adjust one’s feelings and thinking to new situations</i>
Problem-solving	<i>To effectively solve problems of a personal and interpersonal nature</i>
General mood	Self-motivation
Optimism	<i>To be positive and look at the brighter side of life</i>
Happiness	<i>To feel content with oneself, others and life in general</i>

Figure 2.8: The Bar-On Model of emotional intelligence
(Bar-On, 2006:23)

Studies using the Bar-On model (Krivoy, Weyl Ben-Arush & Bar-On, 2000; Bar-On, 2004; Bar-on & Fund, 2004; Mikołajczak, 2014; Song, Lu, Hu, Xu, Li & Liu, 2014) highlight self-awareness, emotional and stress management, problem solving (both of a personal and interpersonal nature), and self-motivation as key to physical health (Figure 2.8). Studies by Bar-On (1997, 2000) confirm the impact EI competencies and skills have on social awareness and interpersonal relationships.

2.6.3 Goleman

Goleman (1995:xii) defines EI as:

“...the ability called here emotional intelligence, which include [sic] self-control, zeal and persistence, and the ability to motivate oneself”.

Goleman (1998) lists five components of EI that exhibit an individual's leadership potential: self-awareness (understanding and knowing your own feelings); self-regulation (managing and controlling own stress levels caused by anxiety and anger); motivation (desire to achieve even when faced with failure); empathy (understanding the emotional makeup of other people); and social skills (managing relationships and building networks). While EI determines a person's learning ability, emotional competencies show how well specific skills are mastered and translating intelligence into workplace capabilities. Statistical analysis of Goleman's EI model by Boyatzis collapsed the original five components into four, namely self-awareness, self-management, social-awareness, and relationship management. Boyatzis, Goleman and Rhee (2000) further reduced the number of competencies to twenty (Figure 2.9).

The framework demonstrates the relationship between the different competencies and the four social skills domains. It further highlights the fact that mastering any of the four skills domains is impacted by a person's ability to learn and apply related competencies. Cherniss and Goleman (2001) conclude that the neurological substrates of human abilities affect a person's learning and development of the EI competencies. It provides clear differentiation between the four skills domains while each domain forms a cognitive domain of ability (Bar-On, Tranel, Denburg & Bechara, 2003; Du Preez, 2012).



Figure 2.9: A framework of emotional competencies
(Goleman, 2011a)

2.6.4 Discussion

Positive organisational behaviour is defined as those actions in a place of work that promote productivity while building constructive relationships. Literature links positive organisational behaviour with high emotional intelligence (Karimi, Leggat, Donohue, Farrell & Couper, 2014; Meisler & Vigoda-Gadot, 2014). Research shows that high levels of EI contribute to personal commitment and corporate citizenship (Abraham, 2005; James, Velayudhan & Gayatridevi, 2010; Pinho, Rodrigues & Dibb, 2014). It is further argued that committed employees are more likely to stay committed during extended periods of stress and uncertainty (Jordan, Ashkanasy & Hartel, 2002). A committed workforce leads to an increase in effectiveness with improved employee health and morale (Cherniss, 2001), while interpersonal and relationship management skills lead to better working relationships and team performances (Lopes, Salovey, Cote & Beers, 2005). This in return has a positive impact on job satisfaction (Carmeli, 2003). EI is an important business tool (Motowidlo, Borman & Schmit, 1997; Carmeli, 2003).

A study done on performance in the workplace revealed that teams with a high EI perform better than their counterparts with a lower EI, and that the latter group requires a special training intervention to improve their performance (Jordan, Ashkanasy & Hartel, 2002). Service providers with a high EI are more likely to provide better customer service, are customer centric in their approach, and show better sales results than their peers (Rozell, Pettijohn & Parker, 2002). Similarly, people with a high EI negotiate better results (Foo, Anger Elfenbein, Tan & Aik, 2004).

Conflict is present and likely to vent in any relationship, whether it is professional or social by nature. Jordan and Troth (2002, 2004) argue that conflict is mostly emotional and often targets a person or group. Goleman (2011a) argues that “the emotional vicissitudes at work in marriage also operate in the workplace, where they take similar forms”.

When EI is low, criticism is often perceived as an attack on the person instead of a call for change. Responses are mostly defensive, finger pointing and shifting blame. This often leads to the retreat by those involved as they feel unfairly treated. Listening and empathy therefore are critical skills in conflict resolution. The arbitrator needs the ability to influence the parties involved to enter into debate and open discussion to secure a win-win result and restore trust.

Leadership is advised to be mindful of the emotional impact critique could have on their teams. Criticism should therefore be directed at what has been done and how it could be done differently. It should serve as an opportunity to work together towards a common goal (Goleman, 2011a & b).

Jordan and Troth (2004) found that groups with a high EI are more likely to resolve conflict in the workplace in a collaborative manner, while those with a lower EI are likely to retreat, to avoid conflict, and show lower levels of performance.

However, despite the above, research has found that employees with a high EI are more likely to change jobs if they are presented with opportunities to apply their competencies in the workplace (Wong & Law, 2002). The continuously high turnover of IT personnel (Lo, 2015) has led to the continuous business intellectual property of its IT systems as well as the degradation of business acumen within the IT department.

2.7 PRACTICAL INTELLIGENCE

Wagner and Sternberg (1985:436) conclude that:

“...a comprehensive theory of practical intelligence in real-world pursuits will encompass general aptitudes, formal knowledge, and tacit knowledge that is used in managing oneself, others, and one's career”.

In their book, *“Practical intelligence in everyday life”*, Sternberg, Forsythe, Hedlund, Horvath, Wagner, Williams, Snook and Grigorenko (2000:97) define practical intelligence as:

“...the adaptation, shaping, and selection [of environments] functions of intelligent thought as it operates in context. It is through adaptation, shaping, and selection that the components of intelligence as employed at various levels of experience become actualised in the real world”.

Sternberg *et al.* (2000:xi) state that most people will refer to practical intelligence as common sense, to solve real-world everyday problems. Joseph *et al.* (2010:149) define practical intelligence of IT professionals as “the managerial, intrapersonal, and interpersonal skills that are used to resolve IT-related work problems”. They argue that although technical competencies are important and necessary, it alone is inefficient for success and those IT professionals must acquire practical intelligence.

Knowing which task should be done first is an example of practical intelligence. Drawing on the work of Wagner and Sternberg (1985), Joseph *et al.* (2010) developed a taxonomy for IT practical intelligence. The taxonomy consists of four dimensions: managing tasks; managing career; managing self; and managing others (Figure 2.10).

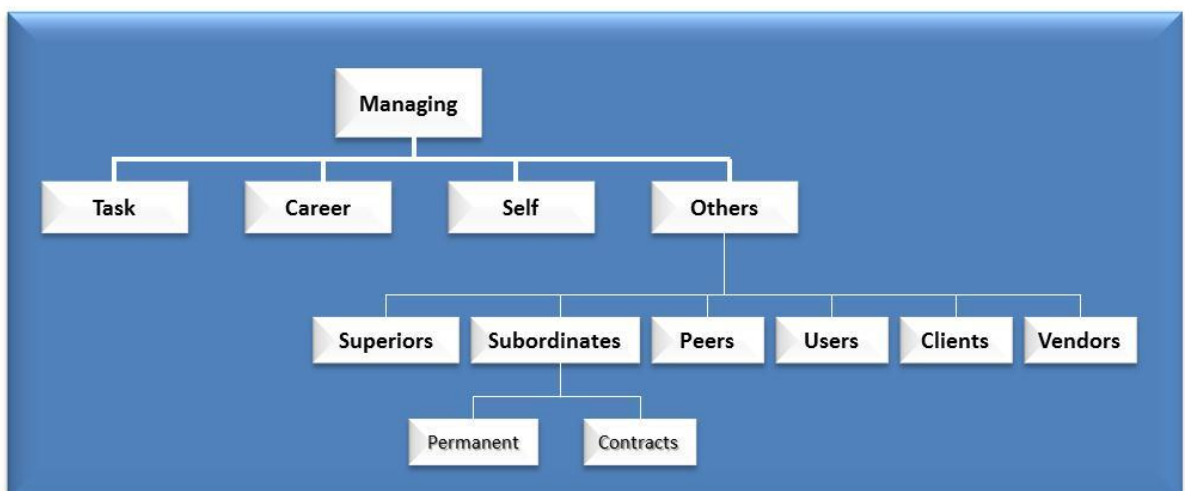


Figure 2.10: Taxonomy of practical intelligence for IT professionals
(Joseph *et al.*, 2010:150)

Managing task refers to the know-how, acquired through hands-on experience and the IT professionals' procedural knowledge of how-to perform an IT related task. When managing their careers, the IT professionals identify skills that will benefit them in future (in terms of job selection and career alternatives) and select projects that will best develop those skills (O'Mahony & Bechky, 2006). According to Wagner and Sternberg (1985), the concept of managing self focuses on intrapersonal competencies such as self-motivation and self-management. Managing others is the most complex of the four dimensions. O'Mahony and Bechky (2006) argue that the IT professional requires knowledge of his or her individual team members' knowledge levels, skills, interests and what drives their individual performance. An IT professional should be able to engage, collaborate, motivate and direct the efforts of a diverse team while maintaining a productive relationship with clients and vendors (Trauth, Farwell & Lee, 1993).

2.8 ALIGNMENT MODELS

This section provides an overview of alignment models to assist business and IT executives to improve the alignment of the business and IT strategies.

Since the commercialisation of IT, companies have been using computing technology to improve operations whilst reengineering their businesses, products and services. As a result, competing and incompatible IT needs arose, leading to miss-alignment within businesses as well as the loss of profit and failure to harness the strategic power of IT. As mediator, the IT department becomes a facilitator of these competing interests for standardisation and interoperability. As the alignment GAP widens, researchers are motivated to find practical solutions. Many alignment models exist; this literature review represents a small sample that dominates the field of study (Chan & Reich, 2007; Cataldo, McQueen & Harding, 2012).

Contingency theory, aimed at addressing both internal demands and environmental issues, influences the need for strategic business and IT alignment (Venkatraman, 1989). Chan and Reich (2007:300) define alignment theory as:

“...the degree to which the organisational mission, goals and business plans are shared with and supported by the IT strategy”.

Alignment is thus achieved when the organisational and IT goals remain in a state of harmony (McKeen & Smith, 2003). Although some variables exist in the different alignment theories, they are seemed to be interchangeable (Chan & Reich, 2007).

2.8.1 MIT90s Framework

During the 1980s the Massachusetts Institute of Technology (MIT) conducted research into the strategic power of IT (Figure 2.11). MIT argues that an investment in IT can bring substantial reward when strategy, technology, structure, process and individual roles are aligned (Morton, 1991).

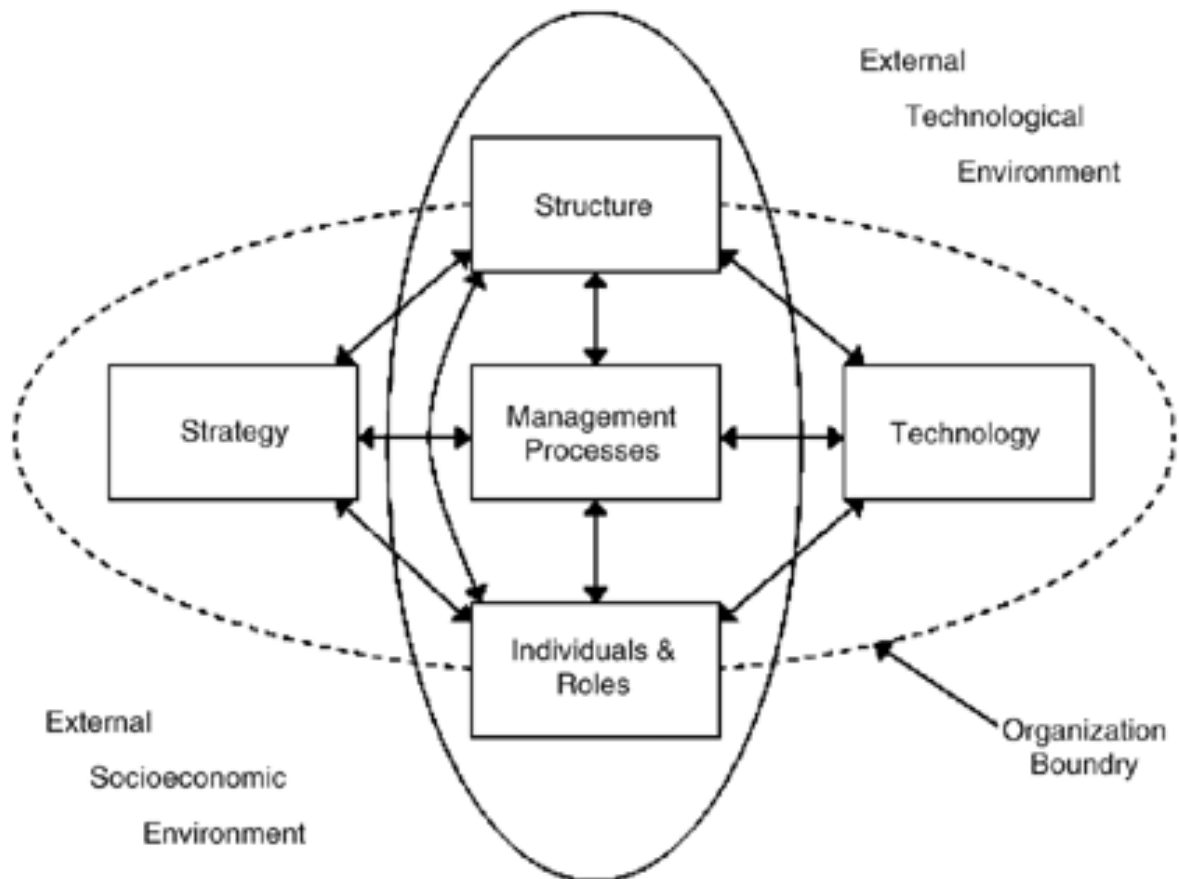


Figure 2.11: The MIT90s Framework
(Morton, 1991:20)

2.8.2 Henderson and Venkatraman Strategic Alignment Model

Building on the MIT alignment framework, MacDonald released a model in 1991 which examines the interrelationships between business and IT strategies, infrastructure and processes—with due consideration of the external impact customers, suppliers and markets has on them (MacDonald, 1991). The Henderson and Venkatraman (1993) Strategic Alignment Model (SAM) is also influenced by the Massachusetts Institute of Technology's research (Figure 2.12). The SAM model is based on four related realms of strategic choice, namely: business strategy; organisational infrastructure and processes; IT strategy; and IT infrastructure and processes.

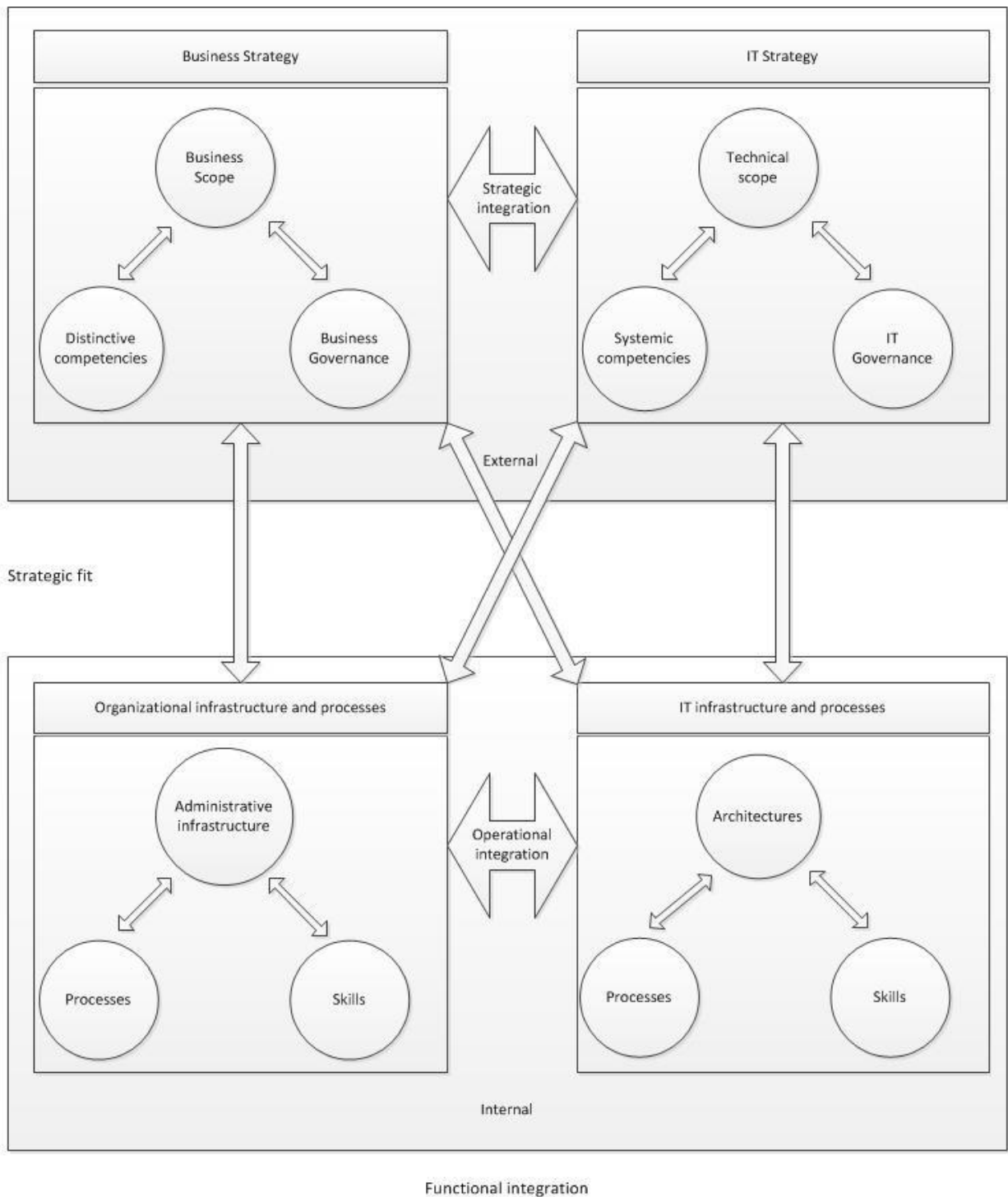


Figure 2.12: The Henderson and Venkatraman Strategic Alignment Model
(Henderson & Venkatraman, 1993:476)

2.8.3 Baets Model

In 1992, Baets developed a model of alignment, adapted from the alignment models of MacDonald (1991) and the enterprise-wide information model from Parker, Benson and Trainor (1988). As in the case with SAM, Baets' Model shows the interaction of business strategy, organisational infrastructure and processes, IS infrastructure and processes, and IT strategy.

Chan and Reich (2007) show that the model further recognises that alignment takes place in a broader context and incorporates factors such as competition, organisational change, human resource issues, the global IT platform, and IS implementation processes (Figure 2.13).

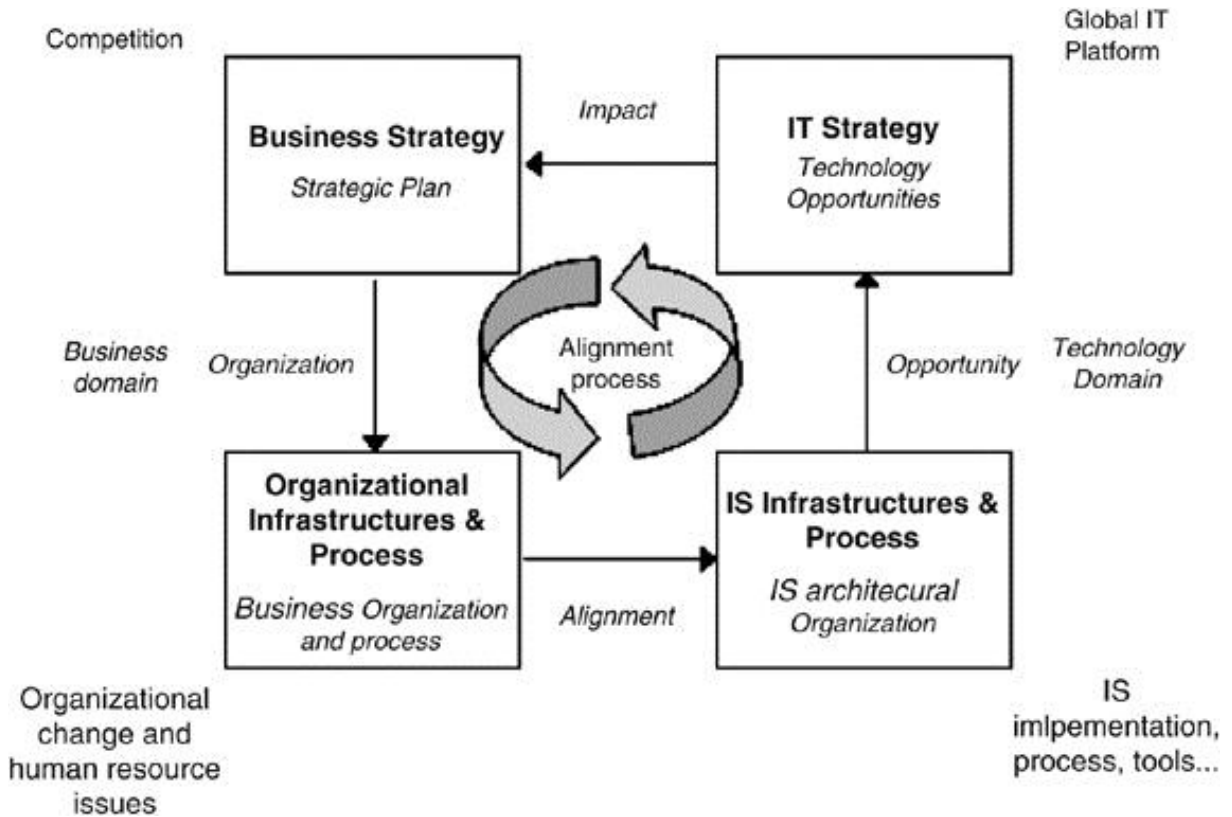


Figure 2.13: The Baets Model
(Baets, 1992:207)

2.8.4 Luftman's Alignment Maturity Model

Luftman (2003) demonstrates that where relationships break down and where expectations differ, is important in aligning the IT and business priorities. Spotting divergent viewpoints could present IT and business with an improvement opportunity. Based on the Capability Maturity Model (CMM) developed by Carnegie Mellon's Software Engineering Institute, Luftman and Kempaiah (2007:167) developed a methodology for assessing how well-integrated IT is with the company's goals. Luftman's Alignment Maturity Model measures how well the technical and business organisations work together. It examines six maturity dimensions, namely: ⁽¹⁾communication; ⁽²⁾competency/value-measurements; ⁽³⁾governance; ⁽⁴⁾partnership; ⁽⁵⁾scope and architecture; and ⁽⁶⁾skills (Figure 2.14).

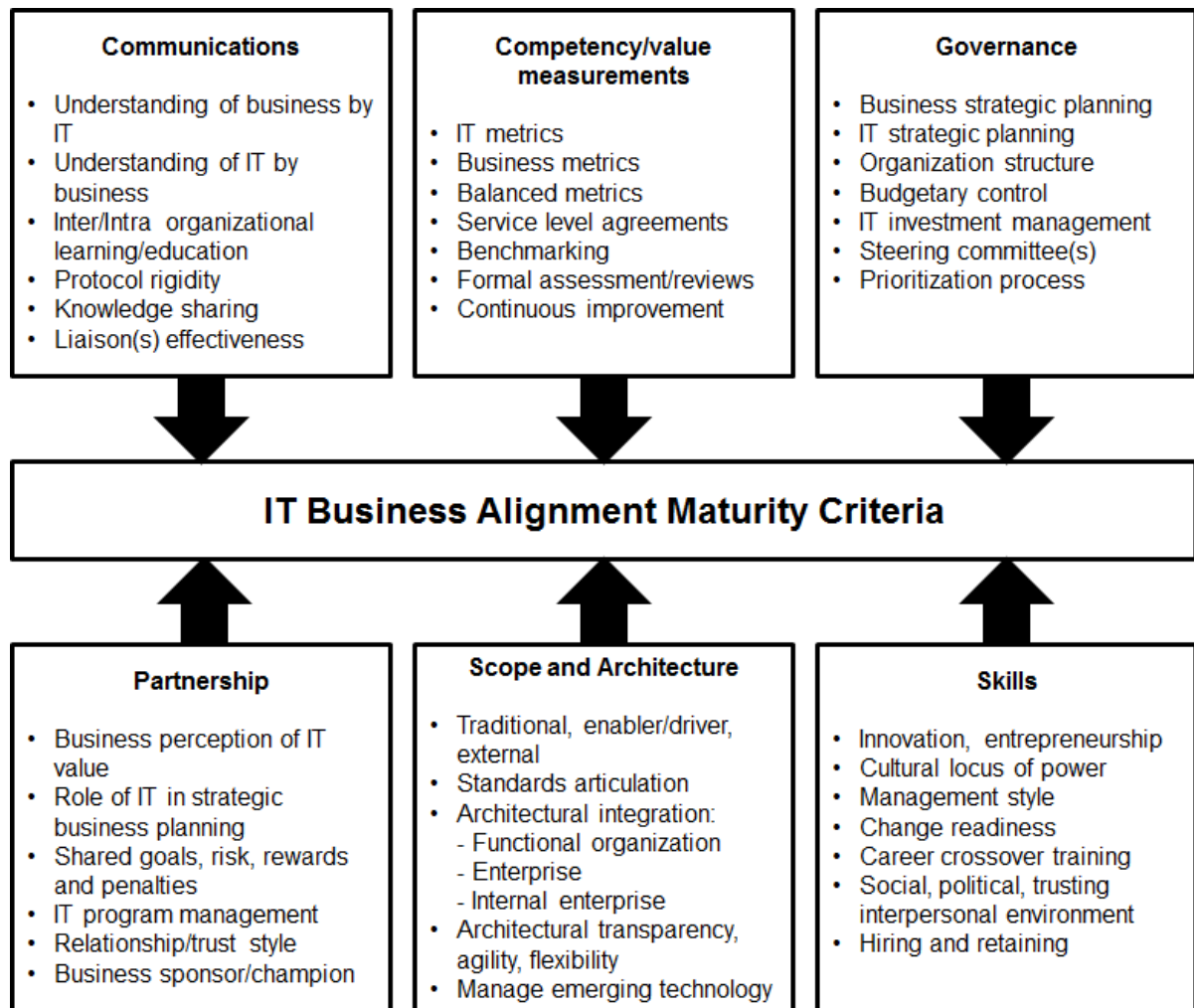


Figure 2.14: Luftman's Alignment Maturity Model
(Luftman & Kempaiah, 2007:167)

As shown in Figure 2.14, communication determines how well the technical and business stakeholders understand each other and measures the effect that internal learning has on the organisation. Competency determines how well the company measures its own performance and derives value from its IT portfolio of projects and services, where value realisation is recognised as a business process and would not come from technology alone. Governance determines adherence to the business strategy, while setting the framework for decision making. It furthers helps to facilitate communication between business and the IT department. Partnership determines the level of trust between business and the IT department and to what extent they are sharing risks and rewards. Scope and architecture determine the impact that technology evolution has on the business growth, market segmentation and profitability while it drives integration across the enterprise and its external partners. Skills determine the IT department's ability to rise as an enabler of business while identifying and retaining the right set of technical and business competencies (Luftman & Kempaiah, 2007).

2.8.5 Luftman's Strategic Alignment Maturity Framework

Understanding the business and IT requirements provides the organisation with a roadmap that identifies opportunities for enhancing and cementing a harmonious relationship between business and IT (Luftman, 2000). Luftman (2003) developed a framework to assist organisations to mature the relationship between business and the IT department to subtract value from its IT investments (Figure 2.15).

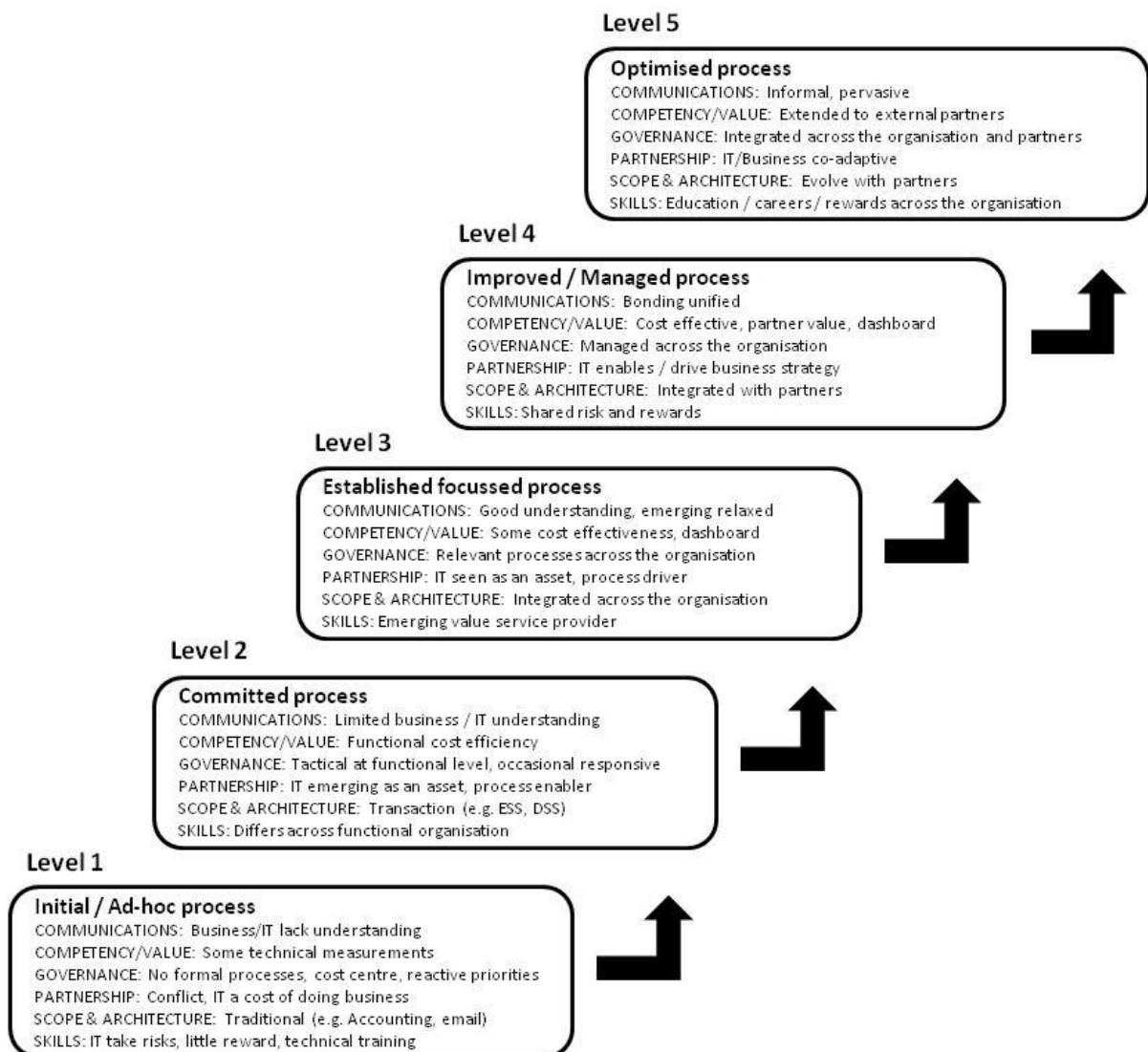


Figure 2.15: Luftman's Strategic Alignment Maturity summary
(Luftman & Kempaiah, 2007:168)

A level 1 organisation is earmarked by poor communication between business and IT, while business fails to understand the value of IT. As a result, business and IT planning is done on an ad-hoc basis only. A level 2 organisation shows signs of some relationship between individual business units and the IT department. Technical skills are still considered by IT management as the most important skill for IT. In a level 3 organisation, IT becomes more

integrated while IT management develops some understanding of the business. A level 4 organisation understands the need and value of strategic alignment. Business views IT as an enabler of organisational change, while career crossover between business and the IT department occurs frequently. Level 5 organisations have a rigorous governance process that drives the integration of IT with the business model and processes across the organisation (Luftman & Kempaiah, 2007).

2.8.6 Gartner's CIO/IT Organisational Maturity Model

Responding to the macro socioeconomic demands requires a continuous adaption and realignment of the business and IT strategies (Venkatraman, Henderson & Oldach, 1993; Bergeron, Raymond & Rivard, 2004). Delivering sustainable organisational value requires IT to improvise and adapt their processes (Sledgianowski & Luftman, 2005) frequently using technology to create a competitive advantage for business.

Silvius (2007:23) argues that IT's efficiency and effectiveness in supporting the organisational strategy is key to organisational success and defines alignment as "the degree to which IT applications, infrastructure and organisation, the business strategy and processes enables and shapes, as well as the process to realise this". Opposing the traditional modelling approach, Silvius (2007) is of the opinion that alignment can be viewed as either a state (the level of alignment achieved) or a process (the activities required to contribute to a specific state of alignment). Following consultation with practising CIOs, Silvius (2007) proposes a set of alignment practices to be adopted by CIOs as part of their IT governance framework, namely: the creation of an enterprise application portfolio to raise awareness of the cost of IT; the centralisation of procurement contracts to leverage organisational buying power through economies of scale; the formalisation of project governance (authorisation and prioritisation) and stakeholder management; the creation, formalisation, management and control of IT standards, for software and hardware, to further drive economies of scale; and the rationalisation and consolidation of the enterprise application portfolio to improve effectiveness and efficiency.

According to Silvius (2007), CIOs view alignment as dependent on a clear strategic vision where business executives are aware of IT's ability to support them, and IT management has the skills and business acumen to support the business. Business on the other hand views alignment as a dialogue between business and IT, collaboration and not just as business prescribing to IT. Alignment is thus determined by the maturity of the relationship between business and IT. It is a partnership between business and IT. Sustaining this partnership requires skills, competencies and commitment from both business and IT. Aligning IT to business needs in practice is not a mechanical 'by-the-book' process (Silvius, 2007).

In 2010, Gartner released its **CIO/IT Capability Assessment Tool** which describes, as in the case of Luftman (2003), different levels of IT capability and maturity. Once this maturity is understood, it assists the organisation in developing a roadmap that identifies opportunities for enhancing and promoting the business and IT relationship to the required levels (Figure 2.16).

The CIO/IT Capability Assessment Tool describes different levels of IT capability					
Domain	Functional Level 1	Enabling Level 2	Contributing Level 3	Differentiating Level 4	Transformational Level 5
Strategy and vision	<ul style="list-style-type: none"> The IT organization is responsible for operating technology assets 	<ul style="list-style-type: none"> The IT organization operates applications and infrastructure driven by business requirements 	<ul style="list-style-type: none"> IT is directly involved in delivering products and services, and business processes 	<ul style="list-style-type: none"> The enterprise uses technology as a basis for market differentiation 	<ul style="list-style-type: none"> The enterprise uses IT to evolve its business model and position in the industry
Executive leadership	<ul style="list-style-type: none"> The head of IT is a managerial role responsible for managing operations 	<ul style="list-style-type: none"> The CIO is an executive role with a defined IT organization 	<ul style="list-style-type: none"> The CIO is an executive and part of the management board or operating committee 	<ul style="list-style-type: none"> The CIO is an executive and member of the management board or operating committee, with additional responsibilities outside of IT 	<ul style="list-style-type: none"> The CIO is a member of the board of directors and a senior executive reporting to the CEO
Business and financial management	<ul style="list-style-type: none"> The business becomes involved when IT performance falls (quality of service, cost, etc.) Funding levels are based on the prior year's operational requirements 	<ul style="list-style-type: none"> Business involvement concentrates on providing requirements for IT IT budgets are fixed, based on the cost of operations and the resources required to develop new solutions 	<ul style="list-style-type: none"> Business personnel are involved full-time, as projects are joint business-IT projects IT budgets are flexible, based on generating an expected business return from the IT portfolio 	<ul style="list-style-type: none"> Business personnel blend with IT personnel and share responsibility for defining and developing solutions IT funding is based on expected revenues generated from products and services 	<ul style="list-style-type: none"> There is no distinction between business personnel and IT personnel Enterprise funding is based on requirements to deliver the enterprise strategy
People and skills	<ul style="list-style-type: none"> IT personnel jobs and skills are defined by the vendor- and technology-specific expertise required for IT operations 	<ul style="list-style-type: none"> IT personnel skills are defined in terms of the application systems and solutions they support 	<ul style="list-style-type: none"> IT personnel skills are specific to industry knowledge and experience 	<ul style="list-style-type: none"> IT personnel are defined by their unique knowledge of the business, including its operations and products 	<ul style="list-style-type: none"> IT personnel and skills are no different from business executive and leadership skills
Technology leadership and management	<ul style="list-style-type: none"> The head of IT organizes resources around IT's operational responsibilities and supported hardware 	<ul style="list-style-type: none"> The CIO and other IT leaders lead through organizing projects and teams around major IT assets such as the ERP system 	<ul style="list-style-type: none"> The CIO and other IT leaders lead through setting goals for IT operations and investments 	<ul style="list-style-type: none"> The CIO and other IT leaders lead through setting business goals and targets for IT's role in creating results 	<ul style="list-style-type: none"> The CIO and other IT leaders are leading enterprise change and restructuring across the enterprise
Performance management	<ul style="list-style-type: none"> IT performance is measured by operational metrics related to cost, quality of service and availability 	<ul style="list-style-type: none"> IT performance is measured in terms of conformance to plan, scope, schedule and quality 	<ul style="list-style-type: none"> IT performance is measured in terms of business value created and delivered across IT resources and assets 	<ul style="list-style-type: none"> Business/IT performance is measured in business terms and the changes to business performance and financial metrics 	<ul style="list-style-type: none"> IT performance is measured in terms of its market value-add

Figure 2.16: CIO/IT Organisational Maturity Model
(Gartner, 2010:61)

According to Gartner (2010), the future of the IT organisation is that of being an integral part of the business, and not an abstract or external service. To improve its performance, productivity, solutions and services to business, the IT department must match its IT capability with enterprise requirements. As in the case of the Luftman model, the Gartner model consists of six alignment areas, each with a clearly defined maturity level. All areas should be given equal attention to mature the alignment between business and IT.

2.8.7 Discussion

Today many IT and business alignment models exist; none of them seem to be an ultimate preference. Current literature seems not to discuss which alignment model dominates the alignment of the IT department goals with the business goals (Chan & Reich, 2007; Cataldo, McQueen & Harding, 2012; Gerow, Grover, Thatcher & Roth, 2014). The common goal of all alignment models is to achieve effective and sustainable IT and business alignment at a strategic, process, people and technology (business infrastructure) level.

2.9 ENTERPRISE ARCHITECTURE

Systems theory promotes an organisation as an open system and not a series of unconnected parts. By the mid 1990s the high performance organisation emerged. Lawler (1996:22) defines six principles of a high performance organisation, namely: ⁽¹⁾organisation can be the ultimate competitive advantage; ⁽²⁾involvement can be the most efficient form of control; ⁽³⁾all employees must add significant value; ⁽⁴⁾lateral processes are the key elements to organisational efficiency; ⁽⁵⁾organisations should be designed around products and customers (not functions); and ⁽⁶⁾effective leadership is the key to organisational leadership. Organisations have since (re)engineered their organisations to become high performing organisations.

To improve is to change, to be perfect is to change often.

Winston Churchill (1874-1965)

Therefore, in order to change, a process first needs to exist, and to exist and be meaningful it needs to belong to something bigger—which can be classified as a system. In theory the system is more than the sum of its individual parts. Importantly, each system has the ability to grow into something bigger and better. Systems analysis was developed as a business problem solving tool which evolved with the view that a business is a living system (Ulrich, 1984). For a system to survive, the structure of a system needs to change regularly to ensure it maintains a balanced position when the conditions within which the system functions, change.

The individual parts of the system are seen as a network of relationships cooperating within a bigger system (Lucouw, 2004). Angyal (1941) argues that the parts of a system are not randomly added to a system, but carefully arranged according to their values or attributes in a system to achieve a specific purpose or goal. New systems are the result of the arrangement of the parts and interaction with other parts that produce attributes which are different from the individual parts (Checkland, 1997; Weinberg, 2001; Jackson, 2003). Mele, Pels and Polese (2010) conclude that systems theory promotes sustainable and long-lasting

performance. Organisations need to build systems that are capable to grow, learn and evolve (Cleveland, 2005). The same philosophy gave rise to what is today known as EA.

The original IEEE 1471:2000 standard defined architecture as:

“...the fundamental organization of a system embodied in its components, their relationships to each other, and the environment, and the principles guiding its design and evolution” (ISO/IEC/IEEE 42010, n.d).

In 2010, the IEEE1471/ISO42010 standard defined the architecture of anything as:

“...the fundamental organization—embodied in its components and their relationships to each other and their environment; the principles that govern its design and evolution” (Holcman, 2010).

The awareness of EA increased in 1987 with the publication of an article in the IBM Systems Journal, titled “*A Framework for Information Systems Architecture*”, by John Zachman. The article laid the foundation and set the direction for EA in the decades to come. Zachman (1987) argues that business success and agility depend on the quality of its information systems and supporting architectures.

The next two decades saw the publication of a number of architecture frameworks. The list includes but is not limited to the following:

- The Zachman Framework for EA (Zachman, 1987; Sowa & Zachman, 1992; Zachman, 1996b; Zachman, 2011)
- The Technical Architecture Framework for Information Management or TAFIM (US Department of Defence, 1994)
- The 4+1 View Model of Architecture (Kruchten, 1995)
- The Clinger-Cohen Act of 1996 (USA Government, 1996)
- The Reference Model for Open Distributed Processing or RM-CDP (ISO/ITU-T, 1997)
- The Federal Enterprise Architecture Framework version 1.1 (CIO-Council, 1999; CIO-Council, 2001)
- The Open Group Architecture Framework or TOGAF (The Open Group, 2003)
- US Department of Defence Architecture Framework version 1.0 (DoDAF Working group, 2003)
- Gartner-Meta Enterprise Architecture Process (Gartner, 2005)
- The Federal Enterprise Architecture or FEA (Federal Enterprise Architecture Program Management Office, Office of Management of Budget) (FEA, 2006a, 2006b, 2006c)

For the purpose of this research, the researcher focused on the following frameworks and methodologies: The Zachman Framework for EA; The Open Group Architecture Framework or TOGAF; The Federal Enterprise Architecture or FEA; and Gartner, as these represent 90% of methodologies used (Sessions, 2007; Burkett, 2012; Gosselt, 2012; Al-Nasrawi & Ibrahim, 2013; Coroiu, 2014; King, 2014).

2.9.1 Zachman Framework for Enterprise Architecture

The Zachman Framework™ is an ontology which describes the enterprise and is not a methodology for creating the implementation of an EA. It is based on Zachman's earlier work on information systems (IS) and enhanced IS architecture, and aims to construct an information system from the stakeholders' perspectives and meet defined expectations (Zachman, 1987; 1996a, 1996b; 2008; 2011). Although the Zachman Framework™ has been published widely and used by many researchers, the framework is once again presented for completeness of this thesis (Figure 2.17).

As can be seen from the framework, a cell is formed where the stakeholder meets a specific objective which represents a specific architectural activity, also known as an artefact. These cells form the basis of the architecture, defining the artefacts of the EA. Although TOGAF and FEA refer to The Zachman Framework™, it lacks addressing support for non-functional requirements and architecture evolution, and does not distinguish between solutions modelling and design. The Zachman Framework™ provides a descriptive platform to define the enterprise.

The Zachman Framework for Enterprise Architecture™

The Enterprise Ontology™

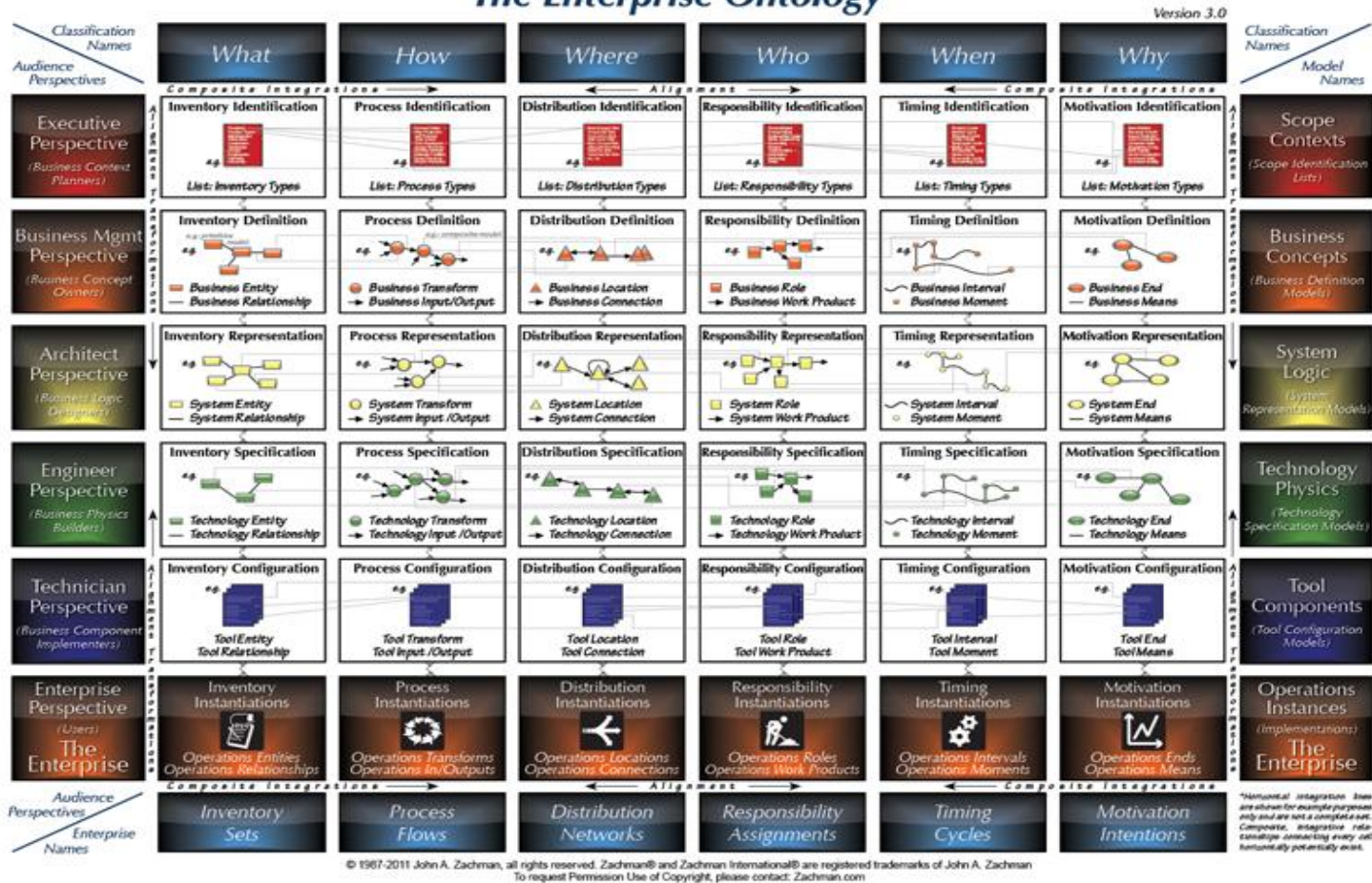


Figure 2.17: The Zachman Enterprise Framework™, Version 3 TM
(Zachman, 2011)

2.9.2 The Open Group Architecture Framework or TOGAF

TOGAF is an interactive framework for EA design, evaluation and implementation. It divides EA into four streams, namely: Business Architecture (a set of integrated processes), Application Architecture (integrated design and relationships), Data Architecture (defines access and data structures), and Technology Architecture (hardware and software infrastructure).

The TOGAF methodology is process driven which provides a repository for related models, patterns and descriptions. It offers resources, guidelines, templates and background information to assist in its implementation. The Architecture Development Method (ADM) provides an end-to-end EA process to steer an organisation through its different levels to an industry specific platform (Figure 2.18).

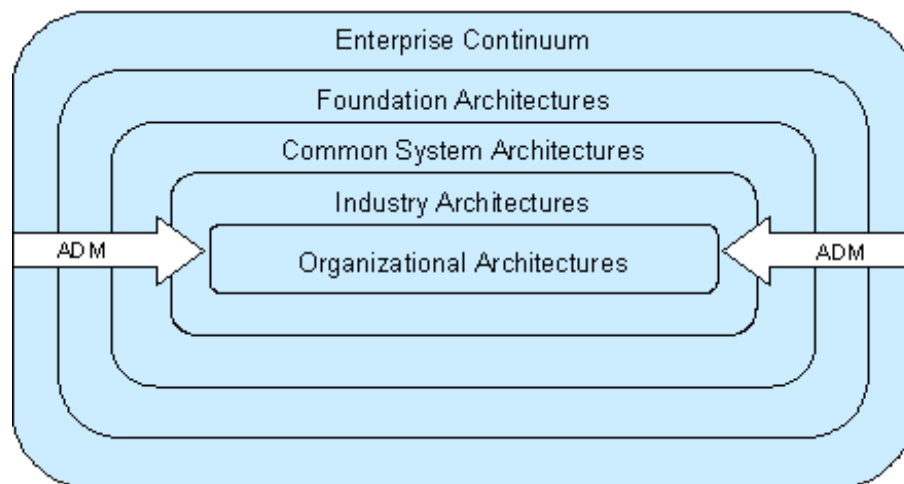


Figure 2.18: The TOGAF Enterprise Continuum
(Sessions, 2007)

The Enterprise Continuum layer represents the elementary level of EA and varies from a generic to a very specific architecture. The Foundational Architecture layer represents the basic IT principles, subscribed to by most organisations. The Common System Architecture layer represents the IT principles subscribed to by organisations of the same type. The Industry Architectures layer represents the IT principles subscribed to by organisations of the same industry. The Organisational Architecture layer represents specific architectural artefacts which serve as the competitive advantage for a specific organisation.

2.9.3 Federal Enterprise Architecture

The Federal Enterprise Architecture or FEA is a reference model that defines EA at five levels for an enterprise, namely: ⁽¹⁾the Business Reference Model (BRM) for a business view

of the different functions; ⁽²⁾the Component Reference Model (CRM) for an IT view of the systems that can support the business functions; ⁽³⁾the Technology Reference Model (TRM) which defines the standards and technologies to build IT systems; ⁽⁴⁾the Data Reference Model (DRM) defining standards for data classification; and ⁽⁵⁾the Performance Referencing Model (PRM) which describes the value derived from the EA. However, FEA is more than just a model. It creates a common language to drive collaboration throughout the enterprise while stimulating performance (Figure 2.19).

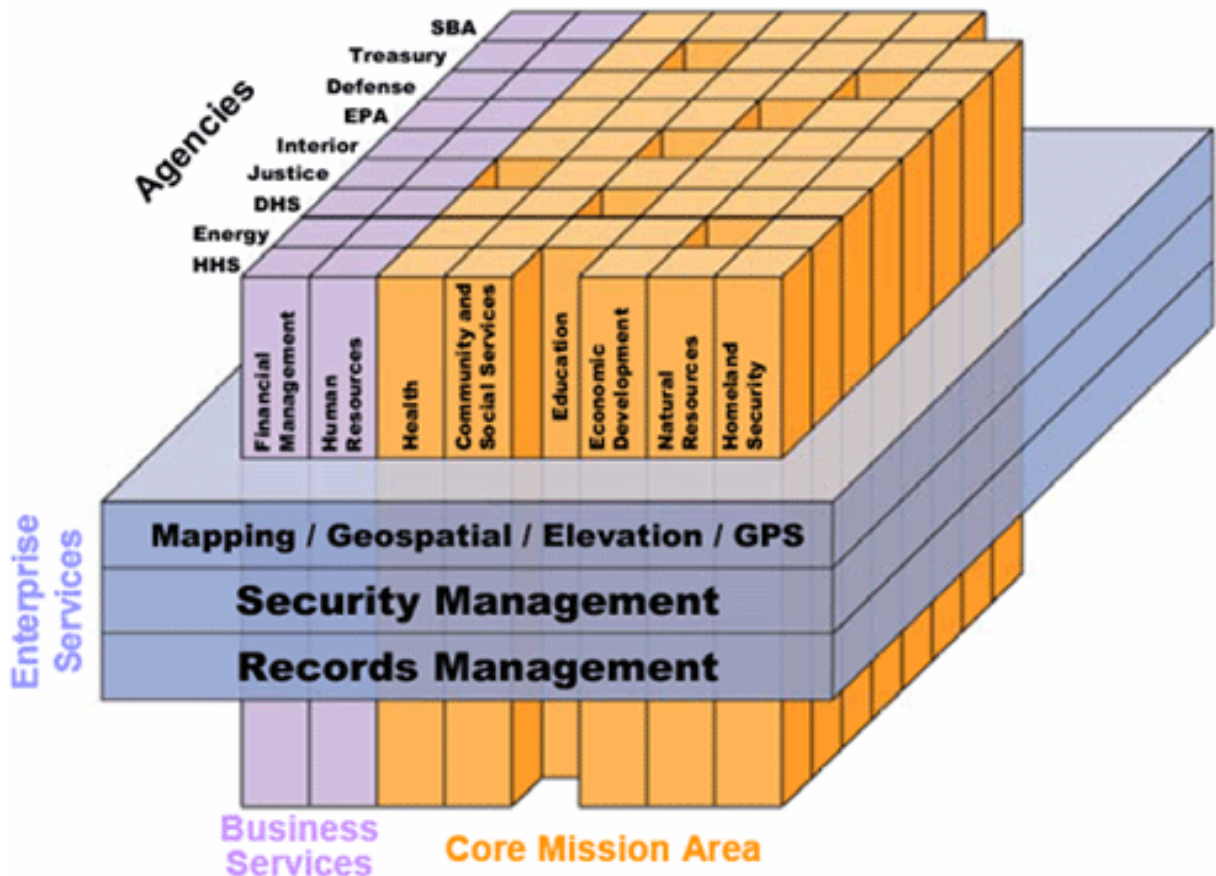


Figure 2.19: Segment Map of the Federal Government
(FEA, 2007:1)

Mission areas (driving the purpose of an enterprise) and business services (supporting services that are common to most business functions) are defined by FEA (2007) as a primary business functionality that drives the need for EA. These are referred to as segments. According to FEA (2007), the EA is made-up of a number of segments. Defining these segments at an enterprise level allows for progressing, migration and the reuse thereof across functional boundaries.

FEA is a driven process allowing for cross functional analysis to reduce duplication, identifying GAPS in the business model, and ensuring interoperability between business functions. The process includes an architecture analysis to define related segments in relationship to the organisational plan, an architecture definition to consider the organisation's options in relationship with the business, data, services and technology architectures, an investment and funding strategy, and a program management strategy and plan for execution (FEA, 2007).

2.9.4 Gartner

The Gartner methodology is an EA practice by a leading international IT research and consulting firm. The methodology, aimed at converting strategy into design, originates from a merger between Gartner and the Meta Group in 2006. It brings together shareholders (business owners), business process owners (information specialists) and IT to collaborate towards a common vision. According to Gartner, a single shared vision of the future state of the business will direct the required changes to the business and IT architectures, set priority and sequence of execution, while ensuring continued alignment with the enterprise strategy (Gartner, 2005). The Gartner methodology success is measured by profitability.

2.9.5 Discussion

EA is the standardisation and integration of business processes to drive efficiency in an organisation, providing the flexibility (also called agility) to compete in a competitive world. In other words, leading organisations standardise the way they are doing business through clearly defined processes and supporting business systems to direct current and future operations.

EA methodologies and frameworks provide a systematic and structured approach towards system design and development (Tang, Han & Chen, 2004). It assists in developing different views from a business, information, software, and technology architecture, as well as a cost perspective for existing and future business systems (Han & Chen, 2002). The architecture process is interrelated and should not be done in isolation. It removes uncertainties and solves design problems through modelling.

Different architecture frameworks result in different outcomes as they follow different architecture viewpoints. Sessions (2007) developed a four scale rating to rank each of the architecture criteria, where 1 is poor, 2 is inadequate, 3 is acceptable, and 4 is good (refer to Table 2.1).

A single methodology therefore might not address the full enterprise requirement. A blended methodology, consisting of elements of the available EA models, amended to specification, could best fit specific organisational needs (Sessions, 2007). However, the success of any methodology is determined by the organisation's commitment towards change. In the researcher's experience, commitment is at its highest when driven from the office of the Chief Executive Officer.

Table 2.1: A comparison of the top four EA methodologies
(Sessions, 2007)

Criteria	Ratings			
	Zachman	TOGAF	FEA	Gartner
Taxonomy completeness	4	2	2	1
Process completeness	1	4	2	3
Reference-model guidance	1	3	4	1
Practice guidance	1	2	2	4
Maturity model	1	1	3	2
Business focus	1	2	1	4
Governance guidance	1	2	3	3
Partitioning guidance	1	2	4	3
Prescriptive catalog	1	2	4	2
Vendor neutrality	2	4	3	1
Information availability	2	4	2	1
Time to value	1	3	1	4

2.10 LITERATURE SUMMARY

This chapter reviewed the literature on management theory, the history of management theories, and the application of management theory within the context of Africa, the Oil and Gas industry and the IT department. The impact of culture on the selection of a management style was looked at. EI was reviewed and alignment models were discussed with the aim to establish how human behaviour impacts on the alignment between business and IT. The literature reviewed people and its characteristics to understand how to develop skills and competencies to transform corporate cultures and values. EA was explored to understand its impact on management, people and business-IT alignment.

The review of literature highlighted the following principles in support of the problem statement and research questions discussed in section 2.1:

- i) Organisations that understand modern-day leadership are differentiating themselves from those who still practice the old-fashioned 'command and control' tactics.
- ii) Western world management styles ignore the African cultures and values, leading to mistrust and creating a feeling of inferiority among the African people.
- iii) Managers in Africa need to develop the ability to integrate traditional and conventional management styles to resolve the unique challenges they are facing.
- iv) Success is not determined by a single management best practice; each situation should be assessed severalty with due recognition to the dominant cultures and values of the region and community when choosing the preferred cause of action.
- v) Macro socioeconomic pressures require the continuous adaption of the organisational strategy to survive.
- vi) Business expects IT to innovate and build new IT competencies to respond rapidly to the changing macro socioeconomic environment.
- vii) Legislation is increasingly being passed to address the governance and management of IT assets to meet corporate goals and objectives.
- viii) EA methodologies and frameworks provide a systematic and structured approach towards system design and development.
- ix) Organisations need to build systems that are capable to grow, learn and evolve.
- x) Misalignment leads to loss of profit and failure to harness the strategic power of IT.
- xi) EI improves workforce efficiency; teams with a high EI operate at higher levels of performance.
- xii) High levels of EI contribute to personal commitment and corporate citizenship.
- xiii) Teamwork improves personal effectiveness with higher levels of commitment, accountability, morale, energy, focus, productivity, willingness to take responsibility and innovativeness, which benefit the whole company.
- xiv) Self-leadership is a systematic set of actions for leading oneself to higher performance and efficiency levels.
- xv) Learning organisations get the right people onboard with the right mix of emotional intelligence, intellectual qualities, experimental learning and business acumen.
- xvi) Strategic buyer-seller relationships create value.
- xvii) Improving organisational performance requires continuous change.
- xviii) Humans fear that technology might make them redundant.

These 18 highlights can be reduced to:

- i) Management of the business including business strategies, human resources, products customers, and many more. The management is under continuous stress resulting from the fast changing environmental forces. Management needs to adopt and adapt more efficiently and effectively than ever before. In order to have the adoptability and adaptability to the changing environment, good decision making is important. This can only be done with quality information and technology. The importance of IT as an enabler and transformer for management has extensively reported on and also discussed in this chapter. However, it is important to once again state that the alignment between business and IT strategies is critical for the survival of the business in the long run.
- ii) Management of the IT department: Just as business is exposed to a changing environment, IT at large is exposed to the same changing environment, adding a complex mesh of innovative developments in hardware and software as well as the generation of data at petabytes per second per day. These developments create the need for a new way of not only managing the human resources but also the technology. This needs to happen quickly, cost effectively, and at the required quality standards.

From the literature review it is evident that traditional management is not suited for the new dynamic environment. As stated earlier, no one management approach seems to be applicable for this new environment in which business needs to operate in. Therefore a question to be asked is what are the complexities of IT implementations within organisations? Depending on these complexities, a specific management style could be applicable. Furthermore, it needs to be understood why IT professionals find it difficult to respond to the demands of the organisation in a traditionally managed environment. In order to answer these questions, a conceptual framework is proposed.

2.11 CONCEPTUAL FRAMEWORK

With the pace of change combined with the macro socioeconomic and environmental pressures on business and business strategies, management needs to enforce governance in the workplace through the deployment of right-sized and right-fit management practices. Developed during the 19th century, traditional management functions such as planning, organising, directing and controlling were set to provide management with a continuum for success, more specifically during the implementation of IT, as illustrated by the 360° circular arrow in the proposed theoretical conceptual framework (Figure 2.20).

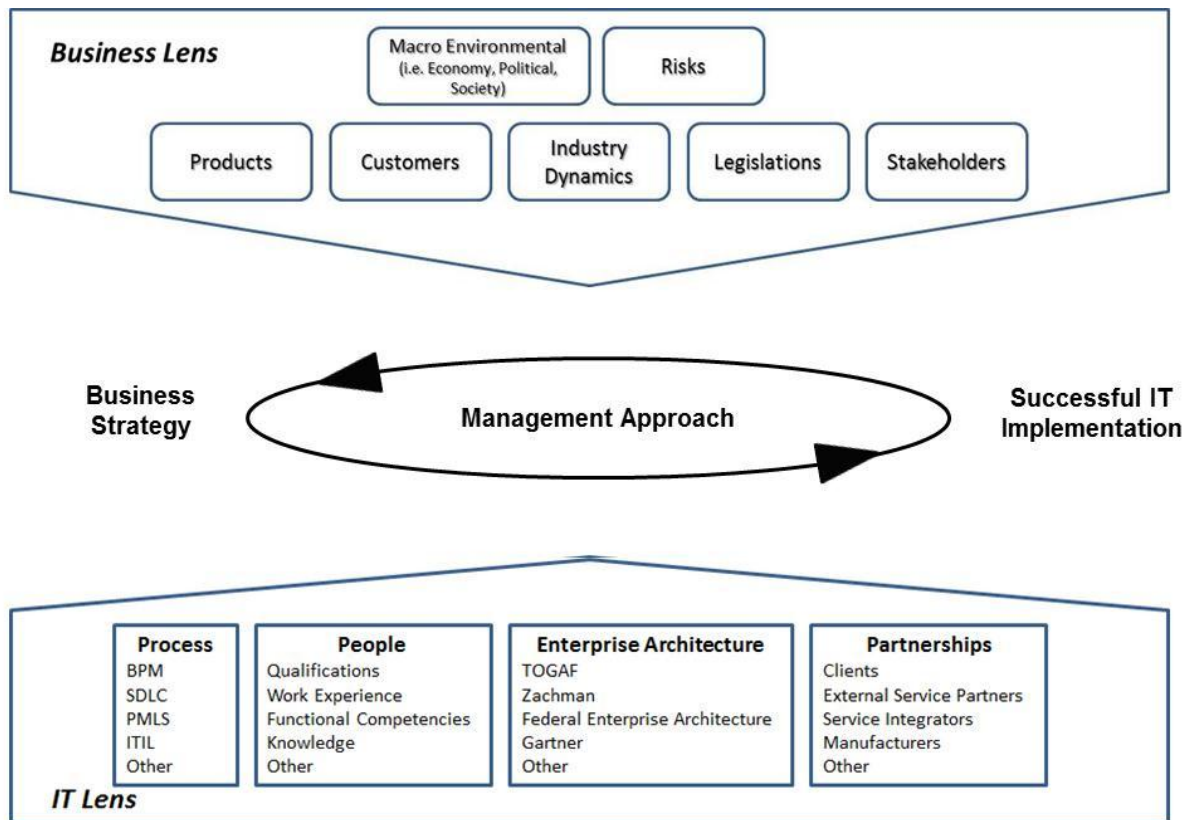


Figure 2.20: The proposed theoretical conceptual framework

The framework consists of a business and IT lens. The different lenses are used to look at IT implementation from the perspective of business and IT strategies. The business lens contains elements such as the macro-environment that influences the business strategy, products, customers, industry specific dynamics, legislation, risks and shareholder expectations. The IT lens looks at the IT processes, systems and tools, people competencies, and EA and partnerships, inside and outside of the IT department. According to literature, these elements create an environment where IT can be implemented successfully while fulfilling its role as an enabler of the business strategy.

Business expects IT to assist them in their race against time, neutralising the crippling effect of an unstable economy and political environment whilst growing market share and revenue. As an enabler of business, IT strives to service the business objectives by leveraging proven methodologies such as the Information Technology Infrastructure Library (ITIL), Systems Development Life Cycle (SDLC), Project Management Life Cycle (PMLC), EA, and strategic partnerships, to name but a few, to deploy secure and sustainable business solutions faster and more cost-effectively. The conceptual framework presents some conventional variables that were intended to contribute to the successful implementation of IT within organisations in the African Oil and Gas industry (Figure 2.20). The key variables in no specific order include: alignment between business and IT, management practices and governance, people, culture, competencies, and partnerships adaptability.

Despite these efforts, poor alignment between business and IT strategies, long lead-times for service delivery, and IT services complexity and rigidity are only some of the challenges faced by business and IT leadership in the African Oil and Gas industry that prohibit IT from delivering sustainable business value.

Underpinning the conceptual framework is systems theory. Systems theory is chosen as the theory of choice because of the systems, sub-systems and feedback loops for self-regulation to maintain a state of dynamic balance. Lucouw (2004) argues that the right form of existence in the present will increase the systems chances of survival and growth in the future. The ability to adapt to environmental pressures will secure a systems existence. To be able to change rapidly in a continuously changing environment, systems should be designed to operate in the present with the future in mind. Short-term sacrifices need to be made to provide for future benefits.

Accurate predictions of natural resources, weather, economics and fashion trends are difficult under the best of circumstances. These are also referred to as complex or chaotic systems as a slight change in the input could result in a significant change in the output. IT systems should therefore be engineered for self-renewal where predicting the future is uncertain. Business and IT, with their partners, will benefit from synergy during the formulation and engineering phases of new systems to present a stronger force against environmental risks.

Richardson (1992) states the importance of feedback loops or mechanisms for self-regulation to allow organisations to maintain themselves in a state of dynamic balance. It further enhances the systems' internal order when changes are unavoidable. As an element of business planning, scenario modelling should assist the business with the development of self-renewing business activities in the business process that will realign and self-correct the business system when subjected to a risky and volatile business environment.

This research is directed towards exploring the disconnect between traditional management theory and IT implementation. The research seeks to understand how and why people react in a specific way and how they manage the complex environment they function in by exploring the roles that the aforementioned variables play in IT implementation.

2.12 CONCLUSION

Chapter Two started off with the context of the research study by positioning the IT department in organisations within the African Oil and Gas industry. The challenges, opportunities and complexities faced by the IT department were discussed against a traditional management background. Following this, management theory was presented,

focusing on the history of management theory and some definitions of management. Management in the African context was then briefly discussed. As the research is about business and IT management, the complexities of the relationship were discussed with the IT department as the background to the discussion.

Looking at the IT department, aspects such as culture, people, talent, team work, EI and PI were reviewed. This was followed by reviewing the strategic position of IT within the organisation. As businesses operate in an open system, the relationship and contribution of strategic partnerships were mentioned.

The alignment of business and IT strategies is important for success of an organisation. To achieve this is a difficult task. As stated in the problem statement, traditional management is failing organisations in achieving and retaining the alignment between the two entities. The complexities as well as several models that are proposed in literature were discussed.

Systems theory is often proposed as a theory to manage complexity. As such, systems theory is used as the basis of EA. EA is widely seen as a strategy or even methodology to narrow the gap between business and IT strategies. EA has been discussed showing the contribution that this architecture can make.

Following the literature discussion is the conceptual framework. The framework is grounded in systems theory and includes two lenses: the business lens and the IT lens. These views take into consideration the changing environments and how IT and business strategies, through management, adopt and adapt using feedback loops. The chapter concludes with a summary.

In order to find answers for the research questions as posed in Chapters One and Two, a mixed-model research design was followed including interviews, surveys and a participant group. Multinational companies with representation in many African countries participating in the African Oil and Gas industry were used as units of analysis. The IT population in the African Oil and Gas industry was divided into three clusters namely CIOs, C-level and ESPs.

Chapter Three is an in depth discussion of the research methodology and includes the research philosophy, research approach and strategy, data collection, data analysis and ethical considerations.

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

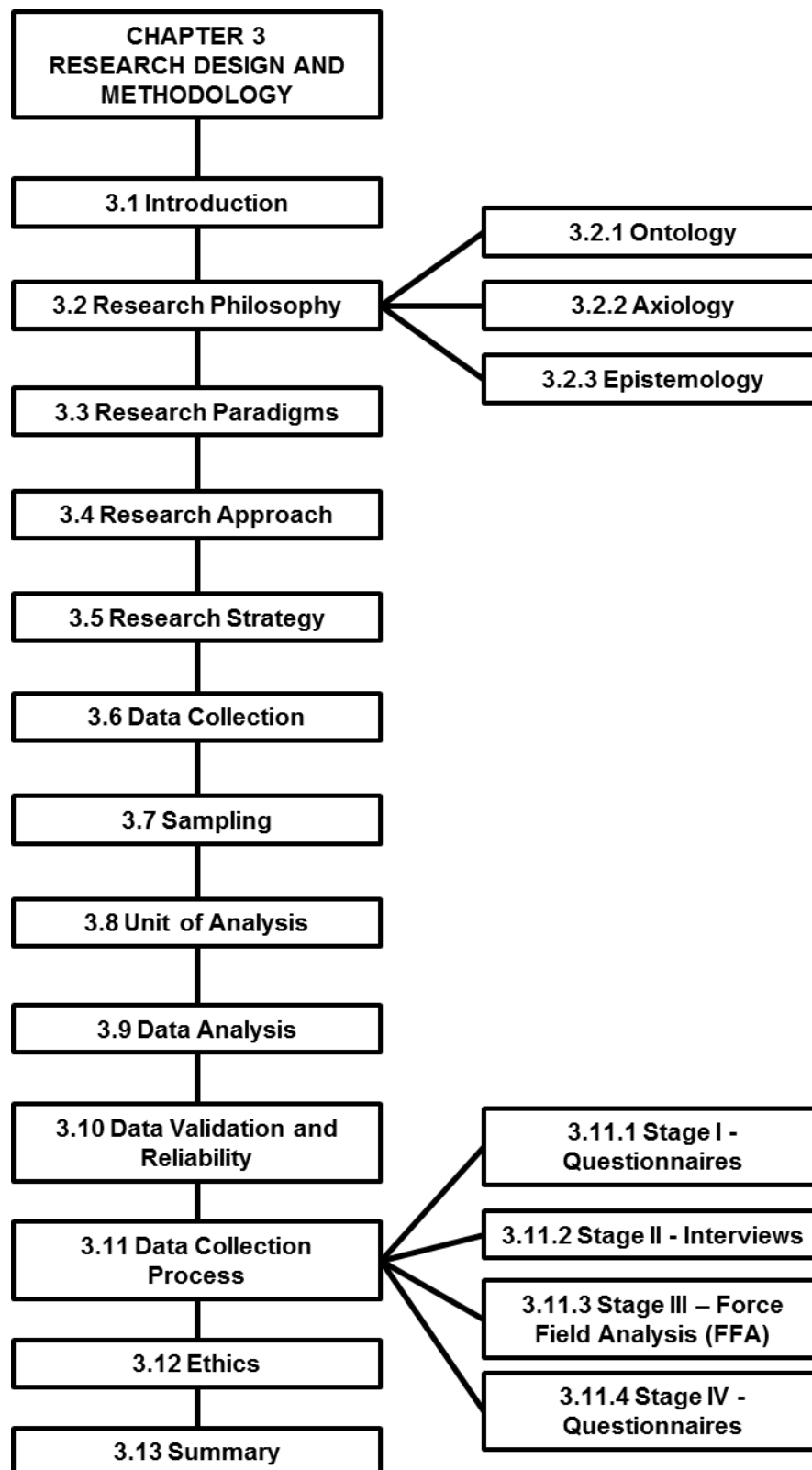


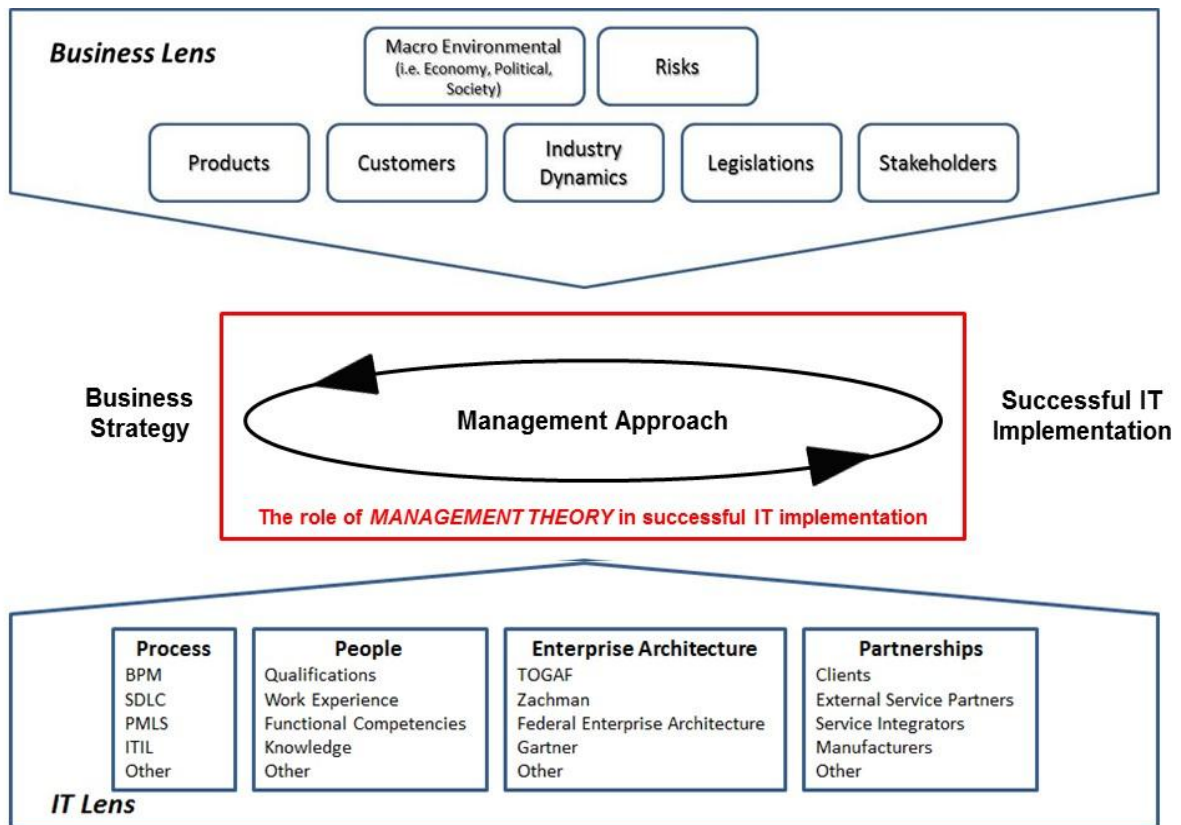
Figure 3.1: Chapter Orientation

3.1 INTRODUCTION

This chapter provides an overview of the research methodology and the choices made in an endeavour to address the research problem and questions. It elaborates on the research philosophy, approach, paradigm, design, and data collection. An overview is provided of mixed-model research, followed by a discussion of the data analysis processes. The chapter concludes with a discussion on the ethical procedures followed in this research.

As business complexity and competition for resources increase, businesses are pressured to make their processes more effective to respond to the changing macro socioeconomic and environmental pressures (Fisk, 2010). At the same time shareholders expect sustainable growth in revenue and market share. Managing and sustaining the adaptability of such a complex system is challenging.

As an enabler of business, IT has become a source of legacy rigidity, long lead-times and complexity rather than a platform for adaptability (Morton, 1991; Ward & Peppard, 1995; Weil & Broadbent, 1998; Luftman, 2003; Chan & Reich, 2007; Gartner, 2010). According to Scholtes and Tessone (2011), an IT service or department needs to provide for heterogeneous and dynamic processes that provide for scalability, complexity, efficiency, manageability and robustness. For this to happen, the IT department needs people skills to fulfil its mandate to manage the complexities (Joseph *et al.*, 2010). The current people skills that IT professionals have are not sufficient to do their job. Theory informs organisations of what technical skills the IT department requires; it does not tell us what people skills are required. IT professionals' inability to build relationships results in them failing to fulfil their role as an enabler of business to meet shareholder expectation of sustainable growth (Figure 3.2) (Rockart & Scott Morton, 1984; Cash & Konsynski, 1985; Porter & Millar, 1985; Earl, 1987). Beatty, Arnett and Liu (2005) argue that business management fails to leverage IT as an enabler of business due to the complexity, unrealistic expectations and dependency business places on the role of the CIO in a changing world. The function of the CIO is further complicated by the rate of change in technology. According to Manfreda and Štemberger (2014), inappropriate alignment between business management and IT further prevents the organisation to create a competitive advantage through technology.



MANAGEMENT THEORY Concerns

- 1) Poor **alignment** between business and IT.
- 2) Long **lead-times** for service delivery.
- 3) IT services are **complex** and **rigid**.
- 4) IT fails to deliver **sustainable business value**.

Figure 3.2: Theoretical conceptual framework to the research problem

This inability to build and manage relationships, as done by traditional management, resulted in the deterioration of business value and possible competitive advantage, while the GAP grows even wider. Traditional management seems inadequate to meet the expectations that business and shareholders have of IT implementations. The problem statement of this thesis, namely *the implementation of an effective and efficient IT department within a complex environment remains problematic for business and IT management as traditional management does not necessarily support the implementation of IT within organisations in the African Oil and Gas industry*, gave rise to the theoretical conceptual framework (Figure 3.2).

In response to the research problem three research questions were defined. The questions are: ⁽¹⁾What are the complexities of IT implementations within organisations? ⁽²⁾Why do IT professionals find it difficult to respond to the demands of business in a traditionally managed environment? ⁽³⁾How do organisations deal with the complexities of IT implementation?

The African Oil and Gas industry presents the case study. The sample used was purposively done. Seventeen companies of non-overlapping groups called clusters were chosen for this

research. The sample was drawn from Chief Information Officers (CIOs), IT Directors, C-level executives, general managers, and external service providers (ESPs) from the African Oil and Gas industry. This approach was followed for both surveys and interviews. A multistage mixed-model research design (a subset of mixed method research) was followed, combining quantitative data with qualitative data in order to add depth to the findings (Swanson & Holton, 1997). Using multistage mixed-model research, the quantitative data were converted into qualitative narratives to be analysed qualitatively. Data analysis was done sequentially. A coding schema was developed prior to the collection of data (Saunders, Lewis & Thornhill, 2009). These focus areas were grouped into themes. Each theme was given a clear description (McMillan & Schumacher, 2010). Coding of the statements presented in the survey questionnaires was done prior to the collection of the data, while coding of the qualitative data was done by the researcher when reading through the transcriptions of the interviews and segmenting the data into the corresponding themes (McMillan & Schumacher, 2010). The research validity was ensured using the 'content validity' criteria to secure adequate coverage of the investigation questions while the research reliability was ensured using the internal consistency method and triangulation.

The research aimed to explore and understand the disconnect between traditional management and the way that IT implementation works. The *ontological* position is *subjectivism* while the research paradigm includes *exploratory* and *interpretive* paradigms. The research approach is *inductive* as the theory developed is based on the analysis of the data collected through case studies, questionnaires and focus group interviews. The research was conducted in the social world as the research has to do with 'what' and 'why', and not what should be (Figure 3.3).

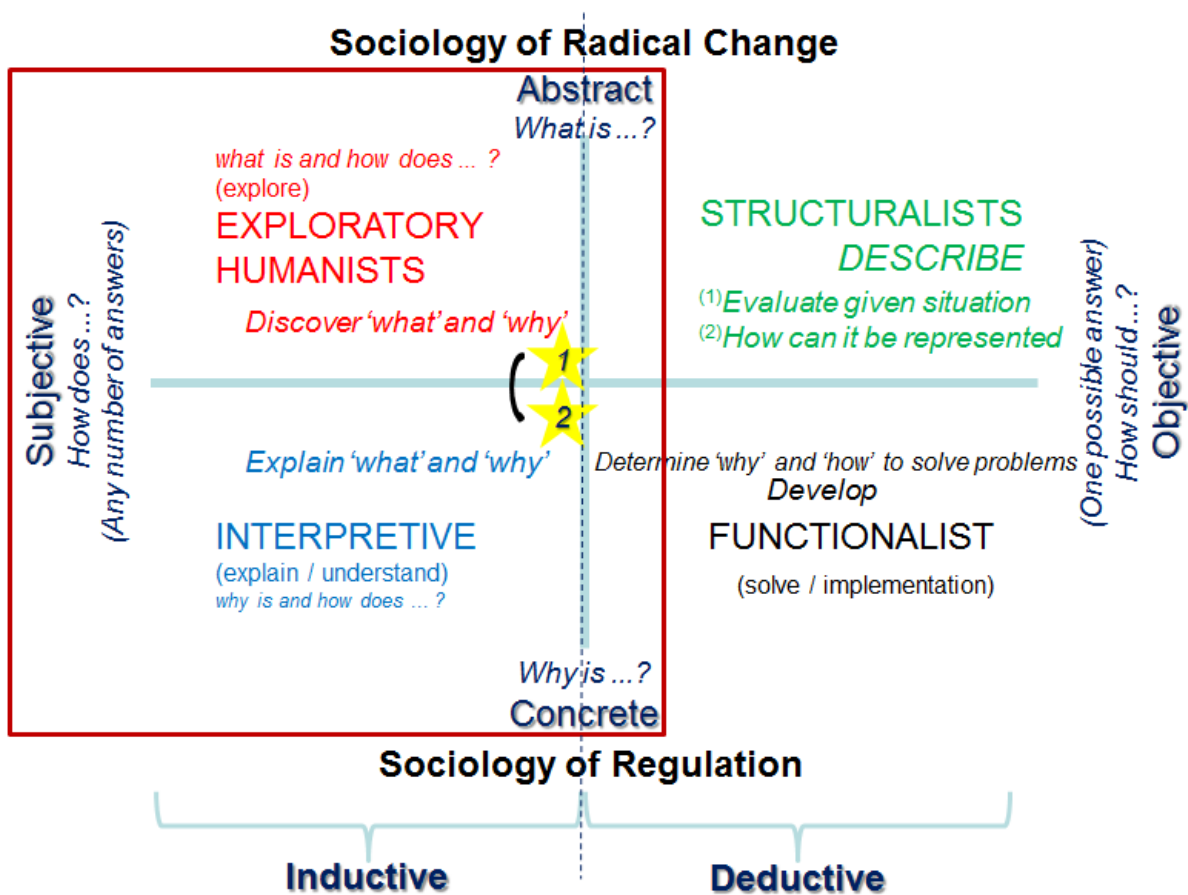


Figure 3.3: Burrell and Morgan’s two dimensions and four paradigms of social science research

(Developed from Burrell & Morgan, 1979:22)

3.2 RESEARCH PHILOSOPHY

The research philosophy relates to the process of developing new knowledge in a particular field. The philosophy chosen contains assumptions of the researcher’s view of the world and has an impact on his understanding of the field of research (Johnson & Clark, 2006). The assumptions made influence the research process and inform the reasoning for selecting one philosophy above another.

Bligh (1982), Elton (1992), Buckler (1996), Biggs and Tang (2007) and Kolb (2014) argue that research is a form of learning through independent reflection and structured analysis. Buckler (1996) and Bahari (2010) argue that reflective learning recognises the constructive character of the conceptual framework within the world it exists in and gives meaning to the information. Saunders, Lewis and Thornhill (2009) state that there are three primary research philosophies: *ontology*, *axiology* and *epistemology*. The three research philosophies assist researchers to appraise, differentiate and structure the enquiry process, enabling the researcher to interrogate and challenge the differences between the assumptions made and

the knowledge produced. The latter is cultivated by invoking ontological questions concerning the nature of social reality and epistemological questions relating to knowledge and its justification. In the next section the three philosophies are discussed.

3.2.1 Ontology

Ontology concerns the researcher's views of the nature of social reality (Walsham, 1995; Nieuwenhuis, 2010). Kanellis and Papadopoulos (2009:3) state that "two ontological schools of thought, namely idealism and realism, are found in literature". Idealism supports the view that no objective reality exists and that reality is determined by the researcher's subjective perception, while the realist believes the world exists independently of the human mind. Kohl (1992:3) argues that "the physical world also exist[s] independently of the human senses". Saunders, Lewis and Thornhill (2009) state that the "ontological stance is influenced by the concepts of objectivism and subjectivism".

3.2.1.1 Objectivism

Objectivism is an ontological position that emphasises the existence of social entities in a reality external to, and independent of, social actors concerned with their existence (Saunders, Lewis & Thornhill, 2009). The research of this study is based on the believe that the world consists of many objects that operate and relate to each other (Staiton-Rogers, 2006) and that in management, reality cannot exist independent from social actors, causing reality to constantly change.

3.2.1.2 Subjectivism

Subjectivism is an ontological position representing the view that social phenomena are created from the perceptions and consequent actions of social actors, and as a result there could be multiple realities (Creswell, 2007). To understand human behaviour, it must be observed and investigated (Saunders, Lewis & Thornhill, 2009).

To determine the nature of reality the researcher's *ontological* position is *subjectivism*. The researcher believes that an objective reality does not exist, and that there are many realities (Creswell, 2007). The interpretivist paradigm assists in identifying many realities in their natural context (Maree, 2010). Social phenomena originate from the perceptions and actions of social actors and can be understood from an internal perspective through words and names by the human mind (Morgan & Smircich, 1980; Saunders, Lewis & Thornhill, 2009; Bahari, 2010).

3.2.2 Axiology

Heron (1996), Bell (2011), Ardila, Gouveia and de Medeiros (2012), Chan (2013), Sheppard (2014) and Teulon (2014) argue that human actions are guided by human values. Heron (1996) states that researchers demonstrate axiology skills through their ability to apply their values as a basis for making judgments about the research they are conducting and how they go about doing it. In other words, axiology concerns the role values play in research choices. The credibility of the researcher's study is determined by the role his own values play in the different stages of the research process (Saunders, Lewis & Thornhill, 2009; Wahyuni, 2012; Walsh & Evans, 2014).

Although the researcher is an active actor in IT within the African Oil and Gas industry, the researcher upheld his independence throughout the study.

3.2.3 Epistemology

Epistemology concerns the nature and construction of valid knowledge as seen from the position of positivism and realism. Hirschheim (1992) and Myers (2008) state that epistemology refers to the researcher's theory of knowledge, specifically how knowledge is acquired and what 'valid' knowledge is. Walsham (1995), Goldman (2000) and Kvanvig (2003) support this view and contend that epistemology is concerned with the nature of knowledge claims and what constitutes acceptable knowledge in a field of study. Becker and Niehaves (2007) argue that epistemology can be viewed as a science, the discipline of analysing how humans understand the knowledge objects they perceive to exist. According to Nieuwenhuis (2010), epistemology describes how one comes to know reality.

In this study, it is accepted that knowledge of the world is composed of the experiences and meanings that social actors add to the phenomena. Furthermore, it is accepted that knowledge and meaning are the result of interpretation, and that reality is subjective.

Chua (1986), Orlikowski and Baroudi (1991) and Myers (2008) suggest three research epistemologies used to conduct social research, each discussed below.

3.2.3.1 Positivism

According to Burrell and Morgan (1979:5),

“...positivism seeks to explain and predict what happens in the social world by searching for regularities and causal relationships between its constituent elements”.

Burrell and Morgan are of the opinion that a positivist view is based on the ontological assumption that the social world is external to individual cognition. A positivist approach explains science in terms of scientific laws (Maree, 2012). The real world therefore consists of hard, tangible and relatively fixed phenomena, external to the researcher's mind and existing independently from an individual's appreciation.

The positivist approach relates to the traditional world-view using quantitative research. In contrast, qualitative research relates to the emergent world-view. Providing multidimensional insight into the research problem, triangulation uses both quantitative and qualitative methodologies (Mangan, Lalwani & Gardner, 2004). In addition, mixed method research provides researchers with an alternative to bridge the paradigm wars between qualitative and quantitative methodologies (Johnson & Onwuegbuzie, 2004). Positivism adopts the stance of the neutral scientist who works with an observable social reality. Remenyi, Williams, Money and Swartz (1998) argue that the end product can be law-like generalisations. Nieuwenhuis (2010) found that positivism enables us to explain causes of things that happened in the world and which are independent of the intention of a social object or person. Nieuwenhuis concludes that positivism emphasises the need for experimentation, observation, control, measurement, reliability and validity during each of the research processes.

3.2.3.2 Interpretivism

Interpretivism assumes that reality is accessed through social construction (such as language, text and role-play) and that knowledge is an act of interpretation. An interpretivist interprets every day social roles in accordance with the meaning social actors (people) give to these roles (Maree, 2012). Because of this high dependency on the human elements, knowledge is not objective. Nieuwenhuis (2010) argues that personal experiences, beliefs and values are biased and subjective. Knowing reality is by exploring the experiences of others regarding a specific phenomenon. The interpretive researcher creates a subjective meaning during interaction with the social world through sharing. Interpretivism is the belief that knowledge and meaning are the result of interpretation (Orlikowski & Baroudi, 1991). This study falls within the realm of interpretivism.

3.2.3.3 Critical research

Chua (1986) argues that a phenomenon can only be understood through a review of history. Orlikowski and Baroudi (1991) conclude that the critical researcher is not only concerned with providing an interpretation of how research participants view reality, but argues that researchers actively critique the social world with the aim to change the social phenomenon under investigation. McGrath (2005) states a need for change due to a belief of unjust social

realities, while Niehaves and Stahl (2006) conclude that critical research aims to change reality and release alienated individuals.

The researcher concludes that critical and non-critical research each represents a distinct set of paradigms and that either could serve as a worthy replacement given the nature of the research.

3.2.3.4 Summary

From an epistemological perspective the researcher formulated and subscribed to the following assumptions and beliefs:

- i) That the researcher created his own subjective meaning of the social world following engagement with the participants, the collection of data, and his understanding of the field of investigation.
- ii) That reality is dependent on the frame of reference of the researcher and participants.
- iii) That reality is subjective.
- iv) That knowledge and meaning are the results of interpretation.

As the reality got uncovered from the perspectives of the participants, patterns, trends and themes emerged which affected the way the researcher conducted the research. The research was done in a value-free way, and independence was upheld at all times. The research was conducted in accordance with the aforementioned epistemology.

3.3 RESEARCH PARADIGMS

Paradigms represent a set of assumptions concerning reality and present a view of the world at a point in time (Lincoln & Guba, 1985; Maree, 2012). Saunders, Lewis and Thornhill (2009:597) refer to paradigm as:

“...a way of examining social phenomena from which particular understandings of these phenomena can be gained and explanations attempted”.

The Burrell and Morgan (1992) framework of social science paradigms is a useful instrument for use in management and business research to generate new insights into real-life issues and problems. Burrell and Morgan (1979) suggest that the term paradigm be used at the philosophical, social and technical levels, where the philosophical level reflects the researcher's paradigm of the social world, the social level dictates the method within which

the research is conducted, and the technical level proposes the techniques available to conduct the research.

The Burrell and Morgan framework presents a matrix that views the nature of the social world in two dimensions, namely subjective versus objective on the one axis, and regulation versus radical change on the other axis (Figure 3.4). Radical change is a judgment of the organisational affairs and suggests ways to make fundamental changes to resolve the identified problems. Regulation explains how organisational affairs are regulated. It offers suggestions on improvements while operating within the existing state of affairs. In the subjective dimension the experience, beliefs and assumptions of the researcher guide his or her interpretation of the social world. In the objective dimension the researcher is guided by his or her observations of the social world.

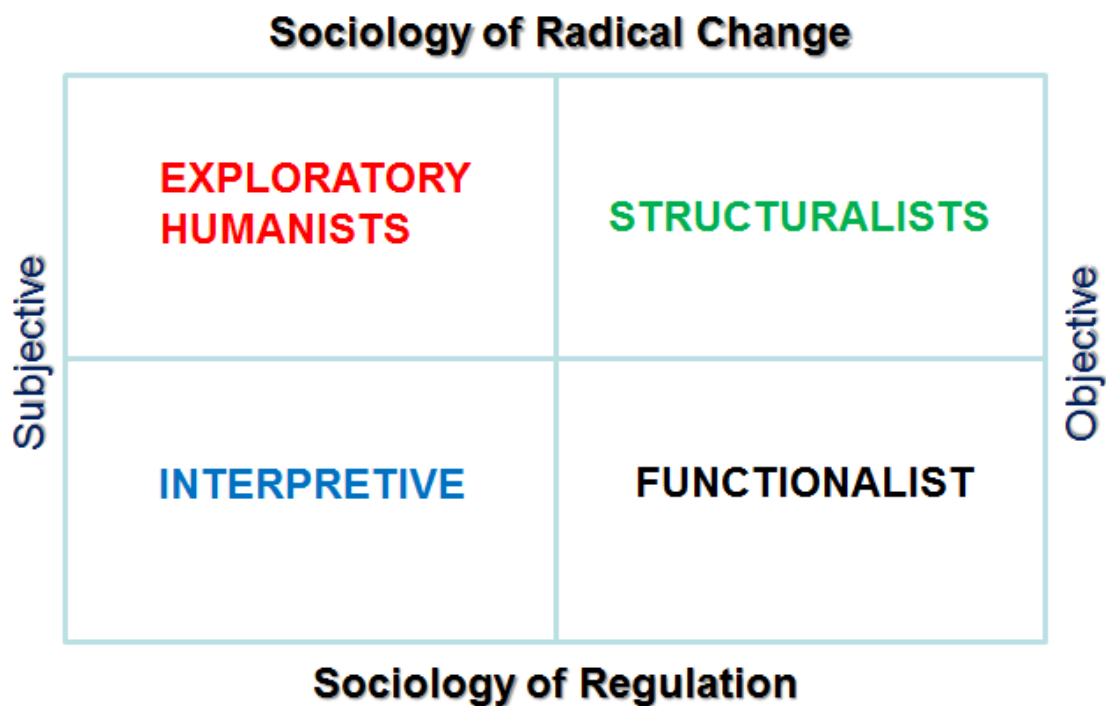


Figure 3.4: Four paradigms of the analysis of social theory
(Burrell & Morgan, 1979:22)

The four quadrants, as seen in Figure 3.4, each represents a different paradigm, namely: *radical humanist*, *interpretive*, *functionalist* and *radical structuralist*. The **radical humanist** paradigm is located within the subjective and radical change dimensions. It adopts a critical perspective on organisational life which focuses on changing the status quo. Burrell and Morgan (1979) argue that it articulates the ways humans transcend and is tied into existing social patterns.

The **radical structuralist** paradigm is located within the objectivist and radical change dimensions. In this paradigm the research aims to achieve change based upon an analysis of the inherent structural conflicts within society which produce disfunctionalities. It adopts an objective ontological perspective as it is concerned with objective entities.

The **functionalist** paradigm is located in the objectivist and regulatory dimensions. In this paradigm the research aims to provide a rational explanation for organisational problems and develop recommendations within the management and organisational structures. The ontological position is objectivism.

The **interpretive** paradigm is located within the subjectivist and regulation dimensions. This paradigm aims to understand the fundamental meanings attached to organisational life by discovering irrationalities. In this paradigm the researcher is not concerned with achieving change but rather to understand and explain what is going on.

This research was approached from a **subjective** ontological stance and is focused within the **exploratory humanists** and **interpretive** paradigms. The organisational life of the IT population, represented by Chief Information Officers (CIOs) or IT Directors, C-level executives and senior account managers from external IT service providers delivering services and products through an internal customer IT department within the African Oil and Gas industry, was explored to understand the disconnect between traditional management and the way that IT implementation works.

3.4 RESEARCH APPROACH

Literature promotes two research approaches: the deductive approach which draws towards the positivism paradigm and the inductive approach which draws towards the interpretivism paradigm (Bahari, 2010; Bhattacharjee, 2012; Spector, Rogelberg, Ryan, Schmitt & Zedeck, 2014). Cause and effect relationships are examined and generalisations lead to predictions, explanation and understanding. Mouton (2011) argues that the most common forms of deductive reasoning are deriving hypotheses from theories and models as well as conceptual explication. Deductive research, according to Robson (2002) and Saunders, Lewis and Thornhill (2009:124), involves five sequential steps, namely:

“...presenting a hypothesis, indicating how the variables will be measured, testing the hypothesis, examining the outcomes, and modifying the theory if needed subsequent to research findings”.

The deductive approach thus develops a hypothesis and designs a strategy to test this hypothesis, whereas the inductive approach develops a theory based on the analysis of data collected (Saunders, Lewis & Thornhill, 2009).

In contrast to the deductive research approach, inductive is defined as applying inferences from specific observations to a theoretical population (Mouton, 2011; Spector *et al.*, 2014). The inductive research approach is concerned with understanding the context in which phenomena are taking place and developing an understanding of the phenomena. Therefore the researcher needs to spend time in the research setting to understand how IT implementation works in the Oil and Gas industry.

Bhattacharjee (2012:4) argues that:

“...a researcher cannot conduct an inductive or deductive research if the researcher is not familiar with both the theory and data components of research”.

The choice of a research approach is useful to the researcher for various reasons. Easterby-Smith, Thorpe, Jackson and Lowe (2008) explain that the choice of a research approach provides the researcher with information to decide on the most appropriate research design while assisting the researcher with the evaluation of alternative research strategies.

The research approach followed in this study was **inductive** (Figure 3.3). The research is not constrained by hypotheses, tests and confirmations (deductive approach). The insights developed from the inductive research could provide material for future research and theories.

3.5 RESEARCH STRATEGY

Yin (2009:18) defines case study research as:

“...an empirical inquiry that investigates a contemporary phenomenon within its real-life context when boundaries between phenomenon and context are not clearly evident”.

It enables the interpretivist to acquire a holistic understanding of the nature and meaning of the relationships that exist between the contributors of the situation under study. Maree (2010) argues that case study research offers a multi-perspective view where the researcher considers the views of other relevant actors and not just the perspectives of one actor. According to Nieuwenhuis (2010), case study research presents the researcher with greater insight and understanding of the dynamics of a specific situation.

McMillan and Schumacher (2010:20) list four research designs categories commonly found in the literature, namely: “quantitative, qualitative, analytic and mixed methods”. In natural sciences, experiments, laboratory work and field work surveys are used to study natural phenomena. Social sciences research mostly uses case studies, interviews, ethnography, grounded theory and design sciences. Qualitative research assists researchers in

understanding the social and cultural context people live in. In qualitative research data are collected through interviews. Saunders, Lewis and Thornhill (2009) and Creswell (2014) list two primary research approaches, namely: mono methods and multiple methods (Fig. 3.5).

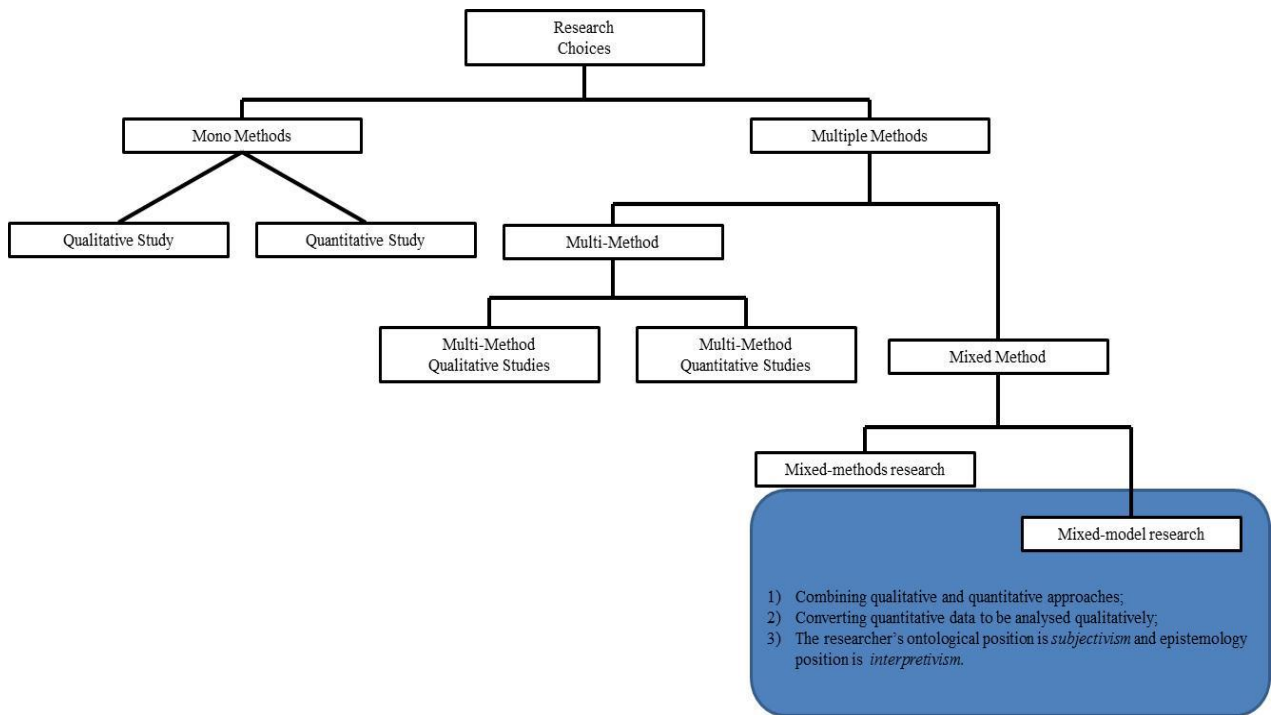


Figure 3.5: Research choices
 (Saunders, Lewis & Thornhill, 2009:152)

Mono methods focus on a single data collection technique and corresponding analysis procedure such as quantitative (numbers and statistics) or qualitative (interviews) methods. Multiple methods focus on multi-method and mixed method research. Multi-method research combines more than one data collection technique, restricted within a qualitative and quantitative world-view using the corresponding analysis procedure only. Mixed method research uses quantitative and qualitative data collection techniques and analysis procedures at the same time.

Mixed-model research is a subset of the mixed method research design which combines quantitative and qualitative data collection techniques and analysis procedures, converting either technique to be analysed using the dominant procedure. Mixed-methods research, also a subset of the mixed method research design, uses quantitative and qualitative data collection techniques and analysis procedures at the same time or sequential—but does not combine them, while mixed-model research combines the data collection and analysis techniques and procedures. Quantitative data are converted to be analysed qualitatively or qualitative data are converted to be analysed statistically. The advantages of mixed-model

research is that it provides for emergent and exploratory research approaches, while it allows for the blending of mixed methods of data collection across qualitative and quantitative data collection points. Mixed-model research further allows for triangulation to improve the quality of the data.

In this study, a **mixed-model** research design was followed, combining quantitative data with qualitative data in order to add depth and detail to the findings (Swanson & Holton, 1997; Tashakkori & Teddlie, 2003; Mertens, 2005; Cameron, 2009). The mixed-model research design enabled the researcher to “combine quantitative and qualitative data collection techniques, and to convert quantitative data into qualitative narrative that can be interpreted and analysed by the researcher qualitatively” (Saunders, Lewis & Thornhill, 2009:153). The researcher used three quantitative surveys (of which one was conducted in the form of a workshop) and one qualitative survey (interviews) as data collection techniques respectively to collect the research data. During the analysis process, as discussed in section 3.9, the data were summarised into manageable themes, patterns, trends and relationships to identify patterns and trends in the data to support the interpretation (Mouton, 2011). The mixed-model research approach allowed for the collection and corroboration of data collected to enhance the credibility of the study (Creswell, 2009; Saunders, Lewis & Thornhill, 2009; McMillan & Schumacher, 2010).

Using two data sources, quantitative and qualitative, as well as two data collection methods (questionnaires and interviews) assisted in the validation of the findings of this study. Data from the qualitative collection was complemented by data from the quantitative collection to provide a more comprehensive interpretation. The mixed-model research design was used to expand the quality of the research by using the data collected through the qualitative and quantitative studies to challenge the results from both methods (McMillan & Schumacher, 2010; Perry, 2012).

3.6 DATA COLLECTION

Documentation review, surveys and interviews are tools for data collection in research projects (Yin, 2009). Three data collection techniques were used to collect data. Qualitative data were collected through interviews using an interview guide with semi-structure questions (stage II). To support the interviews, observations were made to enrich the data collected by allowing the researcher to see things that participants were possibly not aware of or possibly not willing to discuss. Surveys using questionnaires (stages I & IV) and a workshop using Lewin's (1951) Force Field Analysis theory (stage III) were used to collect quantitative data. The participants in each of the data collection phases changed with some overlap, with some participants taking part in both survey and interviews.

Research interview topologies regularly overlap to present a more holistic understanding of the topic under research. Healey (1991) and Healey and Rawlinson (1993, 1994) differentiate between standardised and non-standardised interview topologies, while Saunders, Lewis and Thornhill (2009) categorise interviews as structured, semi-structured or unstructured.

Structured interviews use predefined questionnaires whilst semi-structured interviews are driven by a list of themes and questions but may vary from interview to interview based on the experience of the interviewee. Unstructured interviews are informal with no predetermined list of questions. It aims to explore in depth an area of interest where the interviewee talks freely in relation to the research topic, while the interviewer directs the interviewees to respond to the research questions (Robson, 2002; Ghauri & Gronhaug, 2005; Easterby-Smith, Thorpe & Jackson, 2008). Qualitative research is a naturalistic approach where the researcher collects unobstructive data through techniques such as interviews, semi-structured questionnaires and observations of behaviour in a real-life situation (Maree, 2010).

Data collection in this study was done **sequentially**. At first, quantitative data were collected through a survey by means of a structured questionnaire, followed by qualitative data collected through semi-structured interviews. The data collection process was concluded with a second round of quantitative data collected through structured questionnaires (surveys).

3.7 SAMPLING

The sampling method used in this research was influenced by the research aims, namely to *explore* and *understand* the disconnect between traditional management theory, the way that IT implementation works within the African Oil and Gas industry and the driving forces behind the successful implementation of IT in a complex environment. Sampling is categorised as either probability or non-probability. MacNealy (1999) argues that the selection of the sampling method is informed by the required level of confidence presented in the data collected. Frey, Botan and Kreps (2000:126) conclude that sampling methods “differ in terms of how confident we are about the ability of selected sample to represent to population from which it is drawn”.

Within business research it is not always possible to choose a statistical sample frame to answer the research questions. Non-probability sampling provides an alternative technique to select a sample based on the researcher’s subjective judgment (Saunders, Lewis & Thornhill, 2009; Bless, Higson-Smith & Sithole, 2013). Purposive sampling enables the researcher to select the population of observation that best meets the research aims (Spradley, 1979, Bernard, 2002; Patton, 2002; Morse & Niehaus, 2009; Creswell & Plano

Clark, 2011, Palinkas, Horwitz, Green, Widom, Duan & Hoagwood, 2013; Bless, Higson-Smith & Sithole, 2013). Purposive sampling techniques work well with case study research where the researcher chooses a population for observation (Neuman, 2005) which holds extensive knowledge around the topic of research (Palinkas *et al.*, 2013). The aim of sampling is to select a sample that could possibly reflect the IT population in the African Oil and Gas industry. Purposive sampling was used to select clusters representing the senior level IT population in the African Oil and Gas industry, i.e. Chief Information Officers (CIOs), IT Directors, C-level executives, and external service providers (ESPs).

Multistage or **cluster** sampling is a convenient way of selecting randomly, through multiple interventions or stages, various samples from the available social actors until a representative sample of the population under investigation is collected without having to deal with the logistics and cost associated with probability sampling (Babbie, 1990; Frey, Botan & Kreps, 2000; Latham, 2007; Cameron & Price, 2009; Bless, Higson-Smith & Sithole, 2013). The number of stages is determined by the nature of the research. The researcher selects random samples that are likely to produce a representative sample of the population under observation (Cameron & Price, 2009).

In social research, snowball sampling provides the researcher a medium to access networks of which the researcher is not part of, where trust is an important factor (Cameron & Price, 2009). The researcher chooses a population consisting of a group of interconnected people using the **snowball** sampling method (Maree, 2012; Cameron & Price, 2009). Snowball sampling is based on the selection of a random number of representatives from each cluster, through referencing, to participate in the research. The sample was drawn from CIOs, IT Directors, C-level executives, and ESPs delivering IT services and products through an internal customer IT department within the African Oil and Gas industry. This approach was followed for both surveys and interviews during Stages I and II. Although snowball sampling is not representative of the wider population, in this study it is complimented by the purposive sampling technique which has narrowed down the sample of observation.

Convenience sampling was used in Stages III and IV of the research study to test the finding drawn from the African Oil and Gas population with a group of CIOs and IT executives at the CIO Africa Summit, held at the Arabella Western Cape Hotel & Spa from 10 to 12 June 2014. Stages III and IV of the study are considered exploratory as the sample is not representative of the IT population in the African Oil and Gas industry.

3.8 UNIT OF ANALYSIS

The qualitative variable in this research is *management theory*. Chief Information Officers (CIOs) or IT Directors, C-level executives, and senior account managers from external IT

service providers delivering services and products through an internal customer IT department within the African Oil and Gas industry, present the *unit of analysis* for this research.

The target population for this research were individuals knowledgeable of the issues discussed and selected using the purposive sampling methods (Latham, 2007). The data collection methodologies used to gather research data for this research were case study, interviews and surveys.

3.9 DATA ANALYSIS

In an explanatory sequential design, data are first collected and analysed quantitatively, which the researcher then uses to inform the qualitative data collection and analysis process (Ivankova, Creswell & Stick, 2006).

In a concurrent design the researcher collects and analyses the quantitative and qualitative data at the same time (Fetters, Curry & Creswell, 2013). In practice the quantitative and qualitative data are collected in parallel and analysed after the data has been collected. The two forms of data are separately analysed and then merged.

In a multistage mixed method design, the researcher uses multiple stages to collect data (Nastasi, Hitchcock, Sarkar, Burkholder, Varjas & Jayasena, 2007). A multistage mixed method has three or more stages where data are collected sequentially (Krumholz, Curry & Bradley, 2011).

Data analysis in this study was done sequentially, using a multistage mixed-model (a subset of mixed method) research approach. Both quantitative and qualitative data collected were converted into qualitative narratives to be analysed qualitatively. The data analysis was done manually without making use of any computerised data analysis software. A coding schema was developed by the researcher prior to the collection of data (Saunders, Lewis & Thornhill, 2009). From the research problem, research questions and the literature review in Chapter Two, the following key focus areas emerged: Planning, Organising, Directing, Controlling, Intellectual Qualities (IQ), Emotional Intelligence (EI), Practical Intelligence (PI), Partnering, EA, Business and IT Alignment, and Innovation. These focus areas were grouped into themes. Each theme was given a clear description (McMillan & Schumacher, 2010). Three themes emerged, namely Management Theory, People and Agility (Table 3.1).

Table 3.1: Grouping of the key focus areas

THEME	Management Theory	People	Agility
KEY FOCUS AREAS	Planning Organising Directing Controlling	Intellectual Qualities (IQ) Emotional Intelligence (EI) Practical Intelligence (PI) Partnering	Enterprise Architecture Business and IT Alignment Innovation

These groupings (themes) formed the basis of the data analysis process to test whether the problem statement (*i.e. does traditional management theory predict successful IT implementation?*) holds any ground. From Table 3.4, the researcher developed and applied the following four (4) digit codification system throughout the research project (Table 3.2).

Table 3.2: Data codification system

THEME	Management Theory	Code	People	Code	Agility	Code
KEY FOCUS AREAS	Planning	M-PI	Intellectual Qualities (IQ)	P-IQ	Enterprise Architecture	A-EA
	Organising	M-Or	Emotional Intelligence (EI)	P-EI	Business and IT Alignment	A-AI
	Directing	M-Di	Practical Intelligence (PI)	P-PI	Innovation	A-In
	Controlling	M-Co	Partnering	P-Pa		

Coding of the statements presented in the survey questionnaires was done prior to the collection of the data, while coding of the qualitative data was done by the researcher when reading through the transcriptions of the interviews and segmenting the data into the corresponding themes (McMillan & Schumacher, 2010). On completion, the categories were revisited to determine the relationships between them.

3.10 DATA VALIDATION AND RELIABILITY

Replicating qualitative research is impossible due to human nature and the constant change in the social world (Riege, 2003; Saunders, Lewis & Thornhill, 2009; Mouton, 2011; Maree, 2012). It is therefore important that the researcher's explanation of the phenomena matches reality. The research validity was ensured using the 'content validity' criteria to secure adequate coverage of the investigation questions and sub-questions guiding the questionnaires and interviews. In addition, the researcher gave the questions to experienced researchers and industry specialists to review. The research reliability was ensured using the internal consistency method and triangulation (Mangan, Lalwani, Gardner, 2004; Cameron, 2009; Maree, 2012). The internal consistency method correlates every item with every other item across the entire sample and the average inter-item correlation is taken as the index of reliability.

3.11 DATA COLLECTION PROCESS

The following subsections discuss the four data collection techniques used to collect the data for this study. The data collection was divided into four stages: ^(I)questionnaires (surveys); ^(II)interviews (semi-structured questionnaire); ^(III)Force Field Analysis; and ^(IV)second round questionnaires.

3.11.1 Stage I – Questionnaires

Surveys were conducted through structured questionnaires to collect quantitative data that have been informed by the research problem and research questions (refer to **Appendices E to G**). **Appendix O** shows the relationships between the Stage I survey statements and the research questions. The questionnaire contained a short introduction of the study to the participant and explained the instructions to be followed in completing the survey (Figure 3.6). The questions were informed by the literature review, research problem and research questions. The questions were worded as positive statements and not as questions. The questions were linked to the *unit of analysis* (refer to section 3.8), *themes* (refer to section 3.9), and the research questions (refer to section 1.5). The questionnaire was given to expert researchers and industry specialists to determine the validity and clarity of the questions (**Appendices E to G**).



Centre for CIO Research in Africa

CIO / ISM Questionnaire



NO OBLIGATION: *Participation in this study is none-compulsory and out of free will. All participants will receive a synopsis of the research findings once approved by the Academic Council.*

Name:	
Designation:	
Company:	
Contact Information:	
<i>Office Number</i>	
<i>Mobile</i>	
<i>Email</i>	

Topic: Information Technology in a Complex Economy:
The African Oil and Gas Industry

Aim: To determine the role of MANAGEMENT THEORY in the successful implementation of IT in the Oil and Gas industry in Africa.

Research Problem: The implementation of an effective and efficient IT department remains problematic for business and IT management as traditional management theory does not necessarily support the implementation of IT within organisations.

Instruction: Read each statement and choose the option that best describes your opinion of IT within your organisation.

Figure 3.6: Questionnaire – introducing the study to the participants

3.11.1.1 Scales

The questions were worded as closed statements and participants were asked to choose a response from the Likert Scale provided (Table 3.3) that best described the participants' attitude towards the statement (Maree, 2012). The researcher used a two scales approach, assigning a value to each category to calculate the weight of each statement across all columns. The following five categories were used and associated values assigned to each category (Table 3.3).

Table 3.3: Likert Scale

Category:	<i>Strongly Agree</i>	<i>Agree</i>	<i>Neutral</i>	<i>Disagree</i>	<i>Strongly Disagree</i>
Value:	100%	60%	40%	-60%	-100%

Although the distance between the points is not the same (distance between values), it allowed the researcher to meaningfully differentiate between the statements. It further allowed the researcher to determine the effect each of the statements has on the research problem. Although some academics are of the view that the intervals between the categories of the Likert Scale need to be the same, it is disputed. Wilson and MacLean (2011:262) states that there is “no justification in assuming that the distance between the points on the scale represent discrete measurable distances” and should rather be considered as ordinal data. Allen and Seaman (2007) define ordinal data as:

“...data in which an ordering or ranking of responses is possible but no measure of distance is possible”.

The Likert Scale (Table 3.3) used during Stage I enabled the researcher to measure each individual question. The two scale measurement was designed not to discriminate between row and column and was applied consistently to all statements throughout the Stage I survey (Cheung & Mooi, 1994). The values were not disclosed to the participants so as to not influence or manipulate their responses. The scores of all participants per category were then added up to determine the combined attitude per statement (Table 3.4).

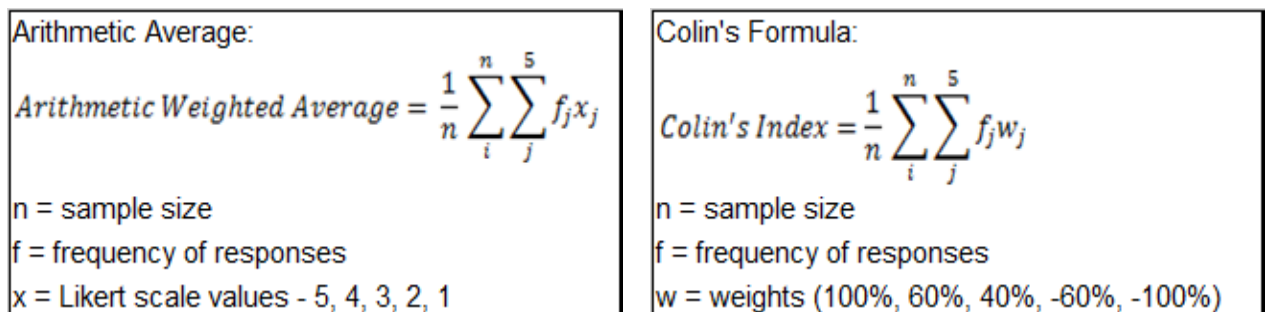


Figure 3.7: Formula used to calculate Stage I Likert Scale averages

Table 3.4: Score Calculator

Statement:		IT delivers a secure and reliable service						
No.	Name:	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree		
1	Participant #1			1				
2	Participant #2		1					
3	Participant #3	1						
4	Participant #4		1					
5	Participant #5		1					
6	Participant #6							
7	Participant #7		1					
8	Participant #8		1					
9	Participant #9			1				
10	Participant #10		1					
11	Participant #11		1					
12	etc.							
...								
20								
Total:		1	7	2	0	0	#	Score
Value:		100%	60%	40%	-60%	-100%	10	
Score:		0.10	0.42	0.08	0.00	0.00		0.60

Each response, per statement, received from each participant, was assigned a weight of 1 while each of the categories contained in the Likert Scale was assigned a value not to exceed a positive (+) or negative (-) 100%. The values per category were as follows: Strongly Agree = 100%; Agree = 60%; Neutral = 40%; Disagree = -60%; and Strongly Disagree = -100%. Each of the statement scores was calculated individually. The scores were calculated by adding up the responses per category, divided by the total number of responses per statement, multiplied by the category value. All five category values were then added up, ranging from +1 to -1, to determine the participants' combined attitude per statement. Where a question was asked to more than one cluster, the scores per statement per cluster were calculated; the cluster scores were then added up and divided by the number of participating clusters to calculate the weighted average score, ranging from +1 to -1 for that particular statement. A score of 0.50 basis points or higher was interpreted as *adequate and effective*; a score ranging between 0.49 and 0.01 basis points was interpreted to have *material opportunities for improvements*, whereas a score of 0 to -1 was interpreted to have *pervasive material weaknesses*.

Clason and Dormody (1994:34) state that there is no “right and wrong ways to analyse data from Likert-type items”. Clason and Dormody (1994) argue that it is of more importance that the questions or statement are meaningful to the research and addressing the research question(s).

3.11.1.2 Email survey

The questionnaires were emailed to participants who had to print, complete, sign, scan and return the completed questionnaires in PDF format to the researcher via email. Completing the questionnaire took approximately ten (10) minutes.

Using the cluster sampling method (refer to section 3.7), ten (10) CIOs/IT Directors out of a cluster size of twenty three (23), eleven (11) C-level executives/general managers out of a cluster size of twenty three (23), and ten (10) ESPs out of a cluster size of twenty three (23) submitted completed questionnaires. All respondents in each of the respective clusters have been selected for their status as active participants in the provisioning of IT services in the African Oil and Gas industry.

3.11.2 Stage II – Interviews

According to Nieuwenhuis (as cited in Maree, 2012:87):

“...an interview is a two-way conversation in which the interviewer asks the participant questions to collect data and to learn about the ideas, beliefs, views, opinions and behaviours of the participants”.

The aim of an interview is therefore to understand the participant’s construction of knowledge and social reality.

3.11.2.1 Interview type

Semi-structured interviews were used to collect qualitative data. The questions were closely linked to the research problem, research questions and sub research questions (refer to section 1.5). Because of the withdrawal of a number of participants from the research for reasons as discussed in section 4.3, the sampling method changed from cluster sampling to the non-probability snowball sampling method. The sample presented a group of interconnected people involved in the provisioning of IT services within the African Oil and Gas industry. Five (5) CIOs/IT Directors, four (4) C-level executives/general managers, and six (6) ESPs were interviewed.

3.11.2.2 Key success factors for interviewing

As per the *unit of analysis* defined in section 3.8, the persons best qualified to answer the questions in terms of the research questions were identified using the snowball sampling technique (refer to section 3.7), in order to elicit the required information. The purpose and aims of the research were explained to all participants in an attempt to collect rich and descriptive data on the phenomenon being studied and to saturate the data. The researcher made every attempt to listen and understand what the participant was communicating verbally and non-verbally.

All interviews were recorded digitally, for which permission was sourced in writing. Notes were taken during the interviews to review the answers for further clarification. All interviews were transcribed within seven (7) days from the date of each interview conducted. Both recordings and transcripts were listened to and reviewed by an independent 3rd party to assure the correctness thereof. Both the recordings and the transcripts of the recordings were given to the interviewees for confirmation.

3.11.3 Stage III – Force Field Analysis (FFA)

The FFA theory was used to confirm the validity of the driving and restraining forces identified during Stages I and II and prioritising these forces based on importance. As a stimulus, the FFA provided clarity on which of the forces to establish, develop further or eliminate as a driver of successful IT implementation in the Oil and Gas industry. The FFA theory was used to collect quantitative data, using the convenient sampling method, from CIOs and IT Directors representing all industries across the African continent who attended the CIO Africa Summit from 10 to 12 June 2014, held at the Arabella Western Cape Hotel & Spa.

Lewin's (1951) FFA theory is a valuable change management tool to transform individual, group and organisational behaviour (Hughes, 2010). The theory is propelled by driving and restraining forces that influence the transformation of behaviour through establishing a balance between these forces. Driving forces initiate the change, push for achievement, and keep the momentum (Bozak, 2003). Understanding the driving forces and their potential influence on the change programme helps to align the driving forces to the overall objectives of the change, while restraining forces impede the ability to achieve the change objectives (Fullan, 1993).

Lewin (1951) argues that change occurs in three stages: the first stage of change is *unfreezing*, the second stage is *moving*, and the third stage is *refreezing* (Table 3.5). *Unfreezing* is the process of opening up, motivating and preparing for new ideas

(philosophies), concepts and perspectives. Moving is the process of building confidence and supporting people affected by change—accepting and buying-in to new perspectives. Refreezing ensures that the new behaviours are reinforced. Lewin (1951) warns that moving stages requires clear and open communication with all stakeholders affected by the change. It is observed that stakeholders actively involved in the planning and implementation of organisational change are more committed to the successful implementation of the change programme (Burke, 2008). To maintain the change, there should be continuous support and assistance to those affected by change in the refreezing stage (Leach, 1994). The success of the theory is to instil strong driving forces to control and suppress the restraining forces (Garvin, 1993).

FFA has been used as a planning mechanism for many years and has proved to be a viable method for dealing with a wide range of organisational needs and problems (Bamford & Forrester, 2003). The visual nature and simplicity of FFA make it a useful tool for group discussions (Kumar, 1999). Hughes (2010) notes Lewin’s systematic method of driving organisational change. O’Farrel (n.d.) comments that:

“...by looking at anticipated factors in such an open, brainstorming-type fashion and critically weighing the impact such forces may have, FFA has the benefit of systematically anticipating resistance in a way that is grounded in reality, thus preventing groups proposing overly ambitious goals”.

Applied within the right audience, the FFA theory can surface valuable insights in the disconnect between traditional management theory and the way that IT implementation works by identifying (through confirmation) and prioritising the driving and restraining forces.

Table 3.5: Lewin's Three-stage Model
(Lewin, 1951)

Phase	Action
Unfreeze	Create an initial motivation to change by convincing people that the current state is undesirable.
Change	<ul style="list-style-type: none"> i) Identify new behaviours and norms. ii) Communicate. iii) Adopt new attitudes and culture.
Refreeze	Reinforce new behaviours through reward systems, communications, structures, etc.

3.11.4 Stage IV – Questionnaires

Quantitative data were collected through structured questionnaires as informed by the FFA workshop. The questionnaire survey served to determine the accuracy of the data collected

during Stage III. The questionnaire contained a short introduction of the study to the participant and explained the instructions to be followed in completing the survey.

3.12 ETHICS

This section compliments the statements made in section 1.8 of the thesis.

Mouton (2011) argues that the ultimate goal of science is to search for the truth. Mouton explains that although scientists have the right to search for truth, it may not be at the expense of the rights of individuals in society. Participants were told in advance about the nature of the study and were given the choice to participate. The identity of the research participants will be protected when publishing the results of the study.

Mouton (2011) further refers to a moral commitment that scientists have to make when searching for truth and knowledge, and argues that this epistemic imperative guides the conduct of scientists. In support of this scientific imperative, the researcher adhered to the following conventions as presented by Mouton (2011:239-245):

- i) The researcher strived to maintain objectivity and integrity during his search for the truth and knowledge.
- ii) The researcher did not under any circumstances change the data collected or amend his observations.
- iii) The researcher recorded all research data in a durable and appropriately referenced form.
- iv) The researcher appropriately referenced all the contributions made by participants in the research.
- v) The researcher rejected any form of plagiarism.
- vi) The researcher did not simultaneously submit an identical manuscript to more than one publisher, journal or any academic institution.
- vii) The researcher did not conduct secret or clandestine research.
- viii) The researcher reported any research findings resulting from public funding in a full, open and timely fashion to the scientific community.
- ix) The researcher did not accept any conditions prescribed by funders and sponsors of the research.
- x) The researcher believes in, and subscribes to the right of privacy of research participants.

- xi) The researcher believes in, and subscribes to the right to anonymity of research participants and to treat any confidential information provided as such.

3.12.1 Ethical considerations

Saunders, Lewis and Thornhill (2009:117) define ethics as “beliefs about what is right or wrong from a moral perspective”. Ethical considerations are of primary importance during research (Maree, 2012). The ethical standards ensued in this study are described in the following section.

3.12.1.1 Research authority approval

Permission to conduct the research was formally obtained from the Faculty of Informatics and Design Research Committee at the Cape Peninsula University of Technology as well as from the Faculty Ethics Committee before the start of the data collection.

3.12.1.2 Full disclosure

The researcher was open and honest with research participants concerning all aspects of the study. The rationale for the study and the research design were explained to the participants and no information was withheld in order to deceive the participants (**Appendices A and B**). The participants were also invited to raise any questions regarding the research with the researcher, the research supervisor, or the Ethics Committee at the Cape Peninsula University of Technology.

3.12.1.3 Voluntary participation

Assurance was given to each participant that participation was voluntary. No one was at any stage of the project coerced into taking part. Participants were informed that they could refuse to sign the consent form and thereby not participate in this study. They were also informed that they could withdraw from the research at any time without any penalty (**Appendices C and D**).

3.12.1.4 Privacy

During the briefing sessions as well as on the consent form participants were informed that participation would be treated as confidential and that information provided will be used for the purpose of the research only.

3.12.1.5 Informed consent

Formal written consent (**Appendices C and D**) was obtained from each of the research participants and their employers where required.

The following informational aspects as recommended by Elias and Theron (2012) were included in the consent form: purpose of the study; statement on voluntary participation; refusal to sign and cancelling of the consent; procedure to complete the questionnaire or to conduct the interview and duration; participant confidentiality; risks and benefits to participants; and contact details of researcher and supervisor for more information about the study.

3.13 SUMMARY

The aim of this research is to explore and understand the disconnect between traditional management and the way that IT implementation works. The *ontological* position is *subjectivism* while the research paradigm includes *exploratory* and *interpretive* paradigms. The research approach is *inductive* as the researcher based his theory on the analysis of the data collected through case studies, questionnaires and focus group interviews. The research was conducted in the social world as the research is concerned with 'what' and 'why', and not what should be.

The African Oil and Gas industry presents the case study. The case study focuses on a system of actions rather than an individual. The research used various sources in the data gathering processes to search for factors that lead to the successful implementation of IT to answer the research question. A multistage mixed-model research design was followed, combining quantitative data with qualitative data to add depth to the findings (Swanson & Holton, 1997). Using multistage mixed-model research, the quantitative data were converted into qualitative narratives to be analysed qualitatively. Purposive sampling was used to select clusters representing the senior level IT population in the African Oil and Gas industry, i.e. Chief Information Officers (CIOs), IT Directors, C-level executives, and external service providers (ESPs). Snowball sampling was used in Stages I and II, while convenient sampling was used in Stages III and IV. The data analysis was done manually. A coding schema was developed prior to the collection of data. These focus areas were grouped into themes. Each theme was given a clear description. Coding of the statements presented in the survey questionnaires was done prior to the collection of the data, while coding of the qualitative data was done by the researcher when reading through the transcriptions of the interviews and segmenting the data into the corresponding themes.

The research validity was ensured using the 'content validity' criteria to secure adequate coverage of the investigation questions while the research reliability was ensured using the internal consistency method and triangulation.

In Chapter Four the researcher presents and discusses the research findings.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSION

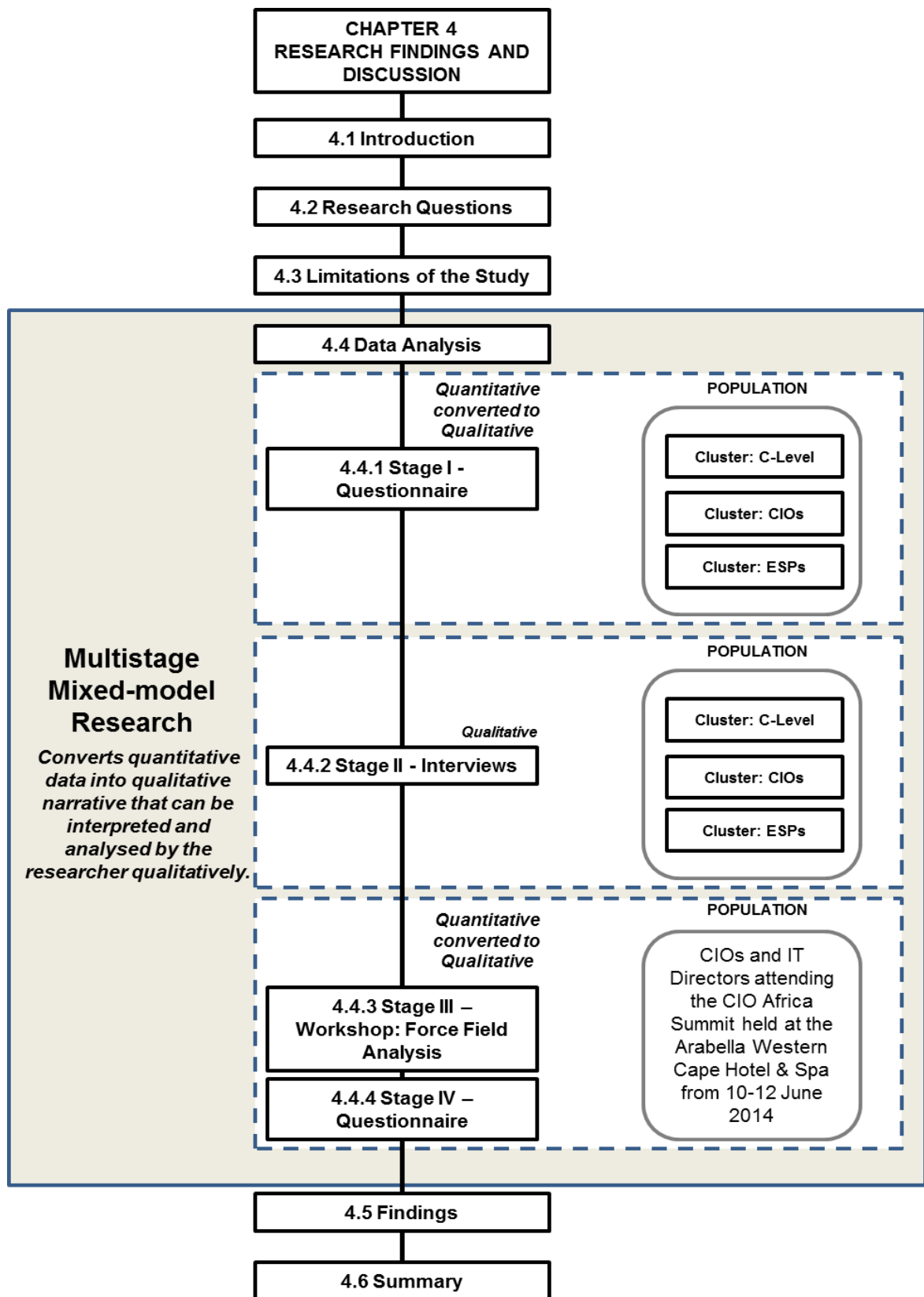


Figure 4.1: Chapter Orientation

4.1 INTRODUCTION

Chapter Three presented the research methodology, design, data collection and analytical approaches followed in this research study. In Chapter Four, the findings of the study are reported.

The research project is directed to explore and understand *the disconnect between traditional management and the way that IT implementation works*. It aims to better understand how management approaches can be applied to implement IT in the organisation and to plan the future with confidence for predictable success in the African Oil and Gas industry. The analysis shows that traditional management in isolation is not sufficient to ensure successful IT implementation in an organisation and raises the importance of people competencies, agility and the need for innovation.

Surviving in an increasingly complex business environment, participants to the research study agreed that African companies need to develop the ability to innovate and reinvent themselves as an essential business competency. Other participants noted that business acumen, innovation, business and IT alignment, and organisational change management remain problematic in the successful implementation of IT. To overcome these obstacles, business needs to complement its current theories and practices with a workforce that is knowledgeable and emotionally well-developed in order to remain competitive, relevant and flexible in a changing business world. This supports van Blerk's (2013) view who argues that IT professionals need emotional competencies to compliment their technical abilities.

4.2 RESEARCH QUESTION

The research problem within the ambit of this thesis reads as follows:

The implementation of an effective and efficient IT department within a complex environment remains problematic for business and IT management as traditional management does not necessarily support the implementation of IT within organisations in the African Oil and Gas industry.

For the comfort of the reader, the research questions relating to the research problem is repeated in Table 4.1.

Table 4.1: Research questions and sub-questions

Research Question 1	What are the complexities of IT implementations within organisations?
Sub-Question(s)	Objective
1.1 What role does traditional management play in IT implementations?	To determine the variables between traditional management theories and those management theories required for successful IT implementation.
1.2 How do relationships within IT and IT teams influence IT implementations?	To determine the effect relationships have on the agility of the internal IT department.
1.3 How does the IT department contribute towards sustainable stakeholder value in a changing environment within the context of traditional management approaches?	To identify the driving forces behind successful IT implementation.
1.4 Why does the application of traditional management not deliver successful IT implementations?	To determine the effect traditional management theories have on the agility of the internal IT department.
Research Question 2	Why do IT professionals find it difficult to respond to the demands of business in a traditionally managed environment?
Sub-Question(s)	Objective
2.1 How do management competencies affect the IT department's ability to deliver successful IT implementations?	To establish the management profile and attitudes for successful IT implementation.
2.2 Why are technical skills not sufficient for successful IT implementations?	To determine what patterns emerge in terms of the Practical Intelligence of selected IT professionals.
2.3 How do organisations recognise the value of, and give due recognition to IT resources?	To determine what patterns emerge in terms of the Emotional Intelligence (EI) of selected IT professionals, in order to identify which main clusters of EI competencies are needed for improved functioning in these roles.
2.4 What are the most important IT management skills for non-IT executives / ESPs?	To establish the management profile and attitudes for successful IT implementation.

Research Question 3	How do organisations deal with the complexities of IT implementation?
Sub-Question(s)	Objective
3.1 Why do organisations struggle to deal with the complexities of IT implementations?	To determine what patterns emerge in terms of organisational change in IT implementation and the role of IT.
3.2 How do organisations implement complex IT strategies?	To determine the relationship between IT and business.
3.3 What is the value of IT understanding the business drivers and speaking the language of business?	To determine the patterns emerging in terms of business and IT alignment during successful IT implementations.

4.3 LIMITATIONS OF THE STUDY

As a practicing CIO in the African Oil and Gas industry the experience of the researcher is that the seen cannot be separated from the unseen. In the ‘seen’, the researcher is associated with his employer and the employer’s business activities (refer to Chapter Three, section 3.2.1.2), whereas in the ‘unseen’, the researcher is perceived as independent from his employer, making a theoretical and practical contribution to the African Oil and Gas industry. The researcher aimed at contributing towards the body of knowledge (management theory), with special reference to IT management.

The researcher experienced that, as an employee of the National Oil Company (NOC) of South Africa which is developing a project to build a ‘300 000 barrels per day’ crude refinery in South Africa (to grow and leverage the benefits of regional cooperation and trade) while pursuing options to enter the African downstream market, he has been viewed as intimidating by peers from International Oil Companies (IOC). These IOCs viewed the actions of the NOC as a threat to their existence. As a result, some role players in the targeted population decided not to participate in the research study.

This resulted in a change in the researcher’s primary sampling technique for the collection of qualitative data. The sampling technique was changed from the cluster sampling method to the non-probability snowball sampling method. In the next section (section 4.4) the data analysis is presented. This is done by presenting the four identified stages (Chapter Three, section 3.7), namely: ⁱ⁾ questionnaires (survey); ⁱⁱ⁾ interviews; ⁱⁱⁱ⁾ workshop with FFA; and ^{iv)} questionnaires. Stages III and IV were used to test the finding drawn from the African Oil and Gas population with a group of CIOs and IT executives at the CIO Africa Summit held at the Arabella Western Cape Hotel & Spa from 10 to 12 June 2014.

4.4 DATA ANALYSIS

4.4.1 Stage I – Questionnaires (survey)

The survey revealed that traditional management (with emphasis on the classical and contemporary styles) is no longer sufficient to deal with the challenges faced by the IT industry in a fast changing world. Business acumen, innovation, business and IT alignment, and organisational change management are some of the contributing forces that prohibit the in-house IT department to service the emerging needs of business in the African Oil and Gas industry.

4.4.1.1 Stage I: Description of sample

Seventy-five (75) invitations were sent to forty-eight (48) companies to participate in Stage I of the research project: *C-level*: twenty-five (25) individual invitations to eight (8) companies; *CIOs*: twenty-five (25) individual invitations to twenty-five (25) companies; *ESPs*: twenty-five (25) individual invitations to fifteen (15) companies.

Thirty one (31) responses were received from the email survey. The thirty one (31) responses were validated and included in the sample for the collection of quantitative data. Twelve (12) companies participated.

Three (3) companies participated in completing and submitting the **C-level questionnaire**—eleven (11) in total, with PetroSA submitting six (6) responses, Engen Petroleum submitting four (4) responses, and TOTAL SA submitting one (1) response.

Seven (7) companies participated in completing and submitting the **CIO questionnaire**—ten (10) in total, with PetroSA submitting three (3) responses, Engen Petroleum submitting two (2) responses, and Nigeria LNG, Tullow, Petroleum Agency SA, Nigeria National Petroleum Corporation, and SASOL each submitting one (1) response.

Four (4) companies participated in completing and submitting the **External Service Provider (ESP) questionnaire**—ten (10) in total, with Hewlett Packard submitting two (2) responses, MES Africa submitting two (2) responses, Business Connexion submitting three (3) responses, and EOH, Gijima, and Baton Electrical each submitting one (1) response. Table 4.2 provides a detail summary of the selected cases for this stage of the study.

Table 4.2: Details summary of the selected cases – Stage I Questionnaires

No	Company	Name	Title	Target Population			Consent
				C-level	CIO/ISM	ESP	
1	PetroSA	Dave Gibson	Business Development Manager	X			Yes
2	PetroSA	Niel Robertson	Subservice and Integration Manager	X			Yes
3	PetroSA	Andrew Dippenaar	VP: New Ventures Upstream	X			Yes
4	PetroSA	Joseph Rhode	Group Financial Manager	X			Yes
5	PetroSA	Faizel Mulla	Strategy Manager	X			Yes
6	PetroSA	Henry de Wet	Technology Development Manager	X			Yes
7	Engen Petroleum	Pranesha Sewpershad	National Manager Retail	X			Yes
8	Engen Petroleum	Ann Benneths	Customer Experience Manager	X			Yes
9	Engen Petroleum	Garnief Adams	Payments Solutions Reporting Analyst	X			Yes
10	Engen Petroleum	Mohamed Hassanally	Retail Automation Manager	X			Yes
11	Total Coal SA	Peter Sutcliffe	CIO	X			Yes
12	PetroSA	Elbe Luus	IS Compliance Manager		X		Yes
13	PetroSA	Palesa Sepanya	IS Operations Manager		X		Yes
14	PetroSA	Sello Lehong	Technology and Architecture Manager		X		Yes
15	Engen Petroleum	Japie Muller	IT Manager: Automation		X		Yes
16	Engen Petroleum	Zonke Mbindela	IT Manager: Finance		X		Yes
17	Nigeria LNG Limited	Emoruwa Adeleke	Head: IT Strategy, Planning and Architecture		X		Yes
18	Tullow Oil PLC	Andrew Marks	CIO		X		Yes
19	Petroleum Agency SA	Viljoen Storm	Information Services Manager		X		Yes
20	Nigeria National Petroleum Corporation	Anthony Okuyelu	Manager IT Strategy and Planning		X		Yes
21	SASOL	Alec Joannou	CIO		X		Yes

No	Company	Name	Title	Target Population			Consent
				C-level	CIO/ISM	ESP	
22	Hewlett Packard	Ashton Steyn	Enterprise Services CTO			X	Yes
23	Hewlett Packard	Sandra Solomon	Strategic Business Executive			X	Yes
24	EOH SAP & EIM Services	Paul Spagnoletti	Coastal Sales Director			X	Yes
25	MES Africa	Corne Marais	Director			X	Yes
26	MES Africa	Dirk Black	Director			X	Yes
27	Business Connexion	Manie Boshoff	Advisory Consultant (MES)			X	Yes
28	Business Connexion	Barry Bester	Manager I/S			X	Yes
29	Business Connexion	EW Henderson	GM Petroleum Oil & Gas			X	Yes
30	Baton Electrical	Athol Hankey	Manager Product Line MCCB			X	Yes
31	Gijima	Theo Hattingh	Chief Client Officer: Industrial			X	Yes

4.4.1.2 Stage I: Description and composition of questionnaires

Sixty one (61) questions were compiled, formulated as closed (positive) statements and submitted to the target population to be answered using a Likert Scale (Chapter Three, section 3.11.1.1, Table 3.3). The target population consisted of three (3) clusters, i.e. C-level executives (CxOs) and general managers (GMs) representing the business, CIOs and IT Directors representing internal IT, and ESP representing the ICT industry (refer to Table 4.3).

Thirty-nine (39) different questions were asked across three clusters, one cluster at a time: C-level thirteen (13); CIO thirteen (13); and ESP thirteen (13).

The same eleven (11) questions were asked to two (2) clusters: C-level/CIO four (4) and CIO/ESP seven (7).

Eleven (11) questions were asked to all three (3) clusters simultaneously.

Thus, in total, 61 different questions were asked.

C-level participants responded to twenty eight (28) questions (refer to **Appendix E**), CIO participants responded to thirty five (35) questions (refer to **Appendix F**), and ESP participants responded to thirty one (31) questions (refer to **Appendix G**).

Table 4.3: Responses to questions per cluster
(Table available as a spreadsheet file on the accompanying CD)

No.	Statement	UNIT OF ANALYSIS		
		C-level	CIO	ESP
1	IT delivers a secure and reliable service	Yes		
2	IT engages with business leaders proactively on new ideas and system enhancements	Yes	Yes	Yes
3	As an enabler of business, IT participates in business strategy formulation	Yes	Yes	
4	IT delivers solutions that enable organisational growth and transformation	Yes		
5	The use of IT (such as mobility, big data management, business intelligence, etc.) accelerates organisational performance	Yes		
6	IT participates in the engineering and continuous improvement of business processes	Yes		
7	IT is an enabler of the organisational vision	Yes		
8	IT personnel have the business acumen to serve our organisation	Yes		
9	IT plays a facilitators role in organisational change	Yes		
10	IT provides timely, relevant and the right data to decision makers	Yes		
11	Knowledge Management assists with the development of new products and services	Yes		
12	IT contributes to the bottom line of our organisation	Yes		
13	The IT structure services the needs of our organisation	Yes		
14	IT provides the platform to reach our customers and service partners	Yes		
15	IT is turning business problems into opportunities	Yes	Yes	Yes
16	IT is an integral part of our business	Yes	Yes	
17	Strategic partnerships is a key growth area for business over the next 5 years	Yes	Yes	
18	Our organisation has a dashboard that shows employees how they perform and contribute to the achievement of the organisational goals and objectives	Yes		
19	CIOs and IT Management need to have domain knowledge of their company	Yes	Yes	
20	When recruiting, we are looking for technical resources with a sound knowledge (acumen) of the operations of our organisation		Yes	
21	Emotional Intelligence is an important element of our recruitment and selection process		Yes	
22	We deliver products, services and processes that create value for our organisation		Yes	
23	Our staff contribute more to the organisation's objectives if they are treated as responsible and valuable employees		Yes	
24	We communicate authentically with the business on all projects, incidents, problems and changes		Yes	
25	Our solutions are simple to use and draw on the same data sources across the enterprise		Yes	
26	IT has a clearly articulated partnership strategy		Yes	
27	Coaches are assigned to employees at all levels in the organisation to drive transformation of people, processes and technology		Yes	
28	Innovation is the deployment of industry practices as a new process to our organisation		Yes	
29	Transforming business strategy into business architecture is a value proposition of IT		Yes	
30	IT (we) optimises, reuses, rationalises, consolidates, sustains and standardises technology and processes to timely meet business requirements in a changing environment, driving business efficiency and profitability		Yes	Yes
31	IT innovation enables our organisation to stay ahead of our competitors		Yes	
32	The role of IT is changing and is even more critical than before	Yes	Yes	Yes
33	IT needs to be agile, innovative and forward looking while learning from previous mistakes—doing it faster, better, smarter and cheaper	Yes	Yes	Yes

No.	Statement	UNIT OF ANALYSIS		
		C-level	CIO	ESP
34	In Africa, 80% of all Business IT projects are delivered within the triple constraints of time, cost and quality	Yes	Yes	Yes
35	All IT services generate shareholder commitment while enabling benefit realisation and growth for business		Yes	
36	When referring to business, we refer to them as partners and not as clients or users		Yes	
37	Enterprise Architecture provides the flexibility to support current and future operations while competing in a competitive world	Yes	Yes	Yes
38	Strategic partnerships allow the (internal) IT department to drive competitive differentiation faster		Yes	Yes
39	Strategic Partnership Management skills are different from Vendor Management		Yes	Yes
40	Communication is key to sustainable alignment	Yes	Yes	Yes
41	Positive behaviour builds constructive relationships	Yes	Yes	Yes
42	A committed workforce leads to increased efficiency	Yes	Yes	Yes
43	High emotional intelligence leads to better conflict resolution in the workplace	Yes	Yes	Yes
44	Practical intelligence is useful in resolving IT-related work problems		Yes	Yes
45	Partnering and collaborative relationships should benefit both parties		Yes	Yes
46	Strategic partnerships provide access to scares and complementary skills		Yes	Yes
47	Our client's internal IT department knows their business strategy			Yes
48	We deliver products, services, solutions and processes that create value for our customers			Yes
49	Solution merits are defined by profitable deployment			Yes
50	Strategic partnerships is a key enabler of growth for both IT and Business			Yes
51	Our solutions in Africa are sold and supported based on a broad set of strategic, marketing, operational and technical skills			Yes
52	We provide repeatable, standardised methodologies and procedures in delivering services			Yes
53	We ensure that our customer maximises the use of our products			Yes
54	We bring quality innovation to the table			Yes
55	Our solutions road maps are aligned with our client's growth requirements			Yes
56	Our customer provides us with opportunities to participate in new initiatives			Yes
57	Our customer's technical staff are of high quality with adequate skills (including business acumen and IQ) and staffing levels			Yes
58	Our customer has clearly defined business objectives and solution requirements, and knows what success looks like		Yes	Yes
59	Our customers have clearly articulated strategic partnership strategies			Yes
60	Our customer behaves in a collaborative manner			Yes
61	Cultural diversity has a positive impact on organisational behaviour, which increases performance and productivity	Yes	Yes	Yes
Total Number of Questions:		28	35	31
Number of questions asked to one cluster:		39		
Number of questions asked to two clusters:		11		
Number of questions asked to all three clusters:		11		
TOTAL:		61		

4.4.1.3 Stage I: Analysis

The responses per cluster are published in the appendix section of this thesis: *C-level* refers to **Appendix H**; *C/O* refers to **Appendix I**; and *ESP* refers to **Appendix J**. The analysis discussed here is based on the combined results of all three clusters. The combined industry responses per question are grouped as: *i) adequate and effective*; *ii) material opportunities for improvements*; and *iii) pervasive material weaknesses*. Each question that obtained a score between 1 and 0.50 basis points is regarded as **adequate and effective**, while a score of 0.49 to 0.01 basis points is regarded to present a **material opportunity for improvement**, and a score of 0 to -1 to present a **pervasive material weakness** (as discussed in Chapter Three, section 3.11.1.1). Each group is reported on per theme, namely: ^(a)**Management Theory**; ^(b)**People**; and ^(c)**Agility**.

i) Adequate and effective

Participant responses deem their organisations **adequate and effective** aligned to 31 (50.82%) of the questions (**Appendix K**). The responses are grouped (Table 4.4) and reported on per theme, namely: ^(a)Management Theory; ^(b)People; and ^(c)Agility, as discussed in section 3.9.

Table 4.4: Questions deemed 'adequate' and 'effective' by participants

No.	Statement	UNIT OF ANALYSIS				THEMES											
						TRADITIONAL MANAGEMENT THEORY				PEOPLE				Agile			
		C-Level	CIO/ISM	ESP	Avg.	Planning	Organising	Directing	Controlling	IQ	B	Practical Intelligence	Partnering	EA	BT Alignment	Innovation	
1	IT delivers a secure and reliable service	0.60			0.60	X	X	X	X								
5	The use of IT (such as mobility; big data management; business intelligence; etc.) accelerates organisational performance	0.58			0.58									X			
7	IT is an enabler of the organisational vision	0.55			0.55										X		
14	IT provides the platform to reach our customers and service partners	0.53			0.53									X			
17	Strategic partnerships is a key growth area for business over the next 5 years	0.69	0.86		0.78								X				
19	CIOs and IT Management need to have domain knowledge of their company	0.69	0.92		0.81					X		X					
21	Emotional intelligence is an important element of our recruitment and selection process		0.54		0.54						X						
22	We deliver products, services and processes that create value for our organisation		0.60		0.60									X			
23	Our staff contribute more to the organisation's objectives if they are treated as responsible and valuable employees		0.64		0.64						X						
26	IT has a clearly articulated partnership strategy		0.50		0.50								X				
32	The role of IT is changing and is even more critical than before.	0.87	0.88	0.92	0.89	X	X	X	X						X		
33	IT needs to be agile, innovative and forward looking while learning from previous mistakes - doing it faster, better, smarter and cheaper	0.91	0.96	0.88	0.92									X	X	X	
38	Strategic partnerships allow the (internal) IT department to drive competitive differentiation faster		0.64	0.72	0.68									X			
39	Strategic Partnership Management skills are different from Vendor Management		0.68	0.92	0.80									X			
40	Communication is key to sustainable alignment	0.78	0.96	0.88	0.87								X				
41	Positive behaviour builds constructive relationships	0.84	0.88	0.92	0.88								X				
42	A committed workforce leads to increased efficiency	0.73	0.96	0.86	0.85								X				
43	High emotional intelligence leads to better conflict resolution in the workplace	0.70	0.92	0.72	0.78								X				
44	Practical intelligence is useful in resolving IT-related work problems		0.80	0.70	0.75							X					
45	Partnering and collaborative relationships should benefit both parties		0.88	0.88	0.88									X			
46	Strategic partnerships provide access to scarce and complementary skills		0.80	0.80	0.80									X			
48	We deliver products, services, solutions and processes that creates value for our customers			0.66	0.66										X		
50	Strategic partnerships is a key enabler of growth for both IT and Business			0.84	0.84									X			
51	Our solutions in Africa are sold and supported based on a broad set of strategic, marketing, operational and technical skills			0.70	0.70										X		
52	We provide repeatable, standardised methodologies and procedures in delivering services			0.76	0.76									X			
53	We ensures that our customer maximises the use of our products			0.52	0.52										X		
54	We bring quality innovation to the table			0.76	0.76											X	
55	Our solutions road maps are aligned with our client's growth requirements			0.78	0.78									X			
56	Our customer provides us with opportunities to participate in new initiatives			0.66	0.66									X			
57	Our customer's technical staff are of high quality with adequate skills (including business acumen and IQ) and staffing levels			0.50	0.50							X					
61	Cultural diversity has a positive impact on organisational behaviour, which increases performance and productivity	0.62	0.54	0.50	0.55						X						

(a) Management Theory

C-level executives stated that IT delivers a secure and reliable service, while all three clusters are in agreement that the role of IT is changing, and is even more critical than before.

(b) People

The participants indicated that strategic partnerships are seen as a key growth area for business over the next five years. The strategic partnerships allow the (internal) IT department to drive competitive differentiation faster. Strategic partnerships provide access to scares and complementary skills—skills that are needed by the industry. The strategic partnerships are seen as a key enabler of growth for both IT and business. The skills required for managing strategic partnerships are different from those required for vendor management. In support of the above, participants agree that IT does have a clearly articulated partnership strategy.

As the participants are from Africa, they are in agreement that cultural diversity has a positive impact on organisational behaviour increasing performance and productivity. The need for positive behaviour is important as the participants are of the opinion that positive behaviour builds constructive relationships. The participants also believe that a committed workforce leads to increased efficiency. Employees contribute more to the organisation's objectives if they are treated as responsible and valuable employees. Participants recognise the role EI plays in organisations and see the importance of EI when recruiting new employees. For example, high EI leads to better conflict resolution in the workplace and as a result, improves relationships between role players. Communication is one of the attributes of EI and is recognised by the participants as key to good relationships and sustainable alignment. The participants also acknowledge that practical intelligence is useful in resolving IT-related work problems.

Participants from the ESP cluster are of the view that the IT departments within the Oil and Gas industry are appropriately staffed with appropriate levels of technical competencies, business acumen and IQ. Participants from the ESP cluster agree that the Oil and Gas industry provides them with opportunities to participate in new initiatives, accessing scares and critical skills through strategic partnering and collaborative relationships to benefit both parties.

The participants are of the opinion that CIOs and IT Management need to have domain knowledge of their company.

(c) Agility

The C-level cluster agrees that IT is an enabler of the organisational vision. As such, the use of IT (such as mobility, big data management, business intelligence, etc.) accelerates organisational performance. It is IT's responsibility to provide the platform to reach customers and service partners. IT needs to deliver products, services and processes that create value for their organisation, while leveraging ESP products, services, solutions and processes to create sustainable value for the Oil and Gas industry and their customers. For IT to create value for their organisation, IT needs to be agile, innovative and forward looking while learning from previous mistakes—doing it faster, better, smarter and cheaper.

The participants indicated that IT provides repeatable, standardised methodologies and procedures in delivering services to ensure that customers maximise the use of the products available to them. They further indicated that solutions road maps are aligned with the organisational growth requirements. In addition, IT solutions in Africa are sold and supported based on a broad set of strategic, marketing, operational and technical skills. The support is made possible by providing repeatable, standardised methodologies and procedures in the delivering of IT services. The ESP cluster also indicated that they support the Oil and Gas industry by bringing quality innovation to the table.

ii) Material opportunities for improvements

Twenty-four (39.34%) questions are deemed by the participants to have **material opportunities for improvements (Appendix K)**. The responses are grouped (Table 4.5) and reported on per theme, namely: ^(a)Management Theory; ^(b)People; and ^(c)Agility, as discussed in section 3.9.

Table 4.5: Questions deemed to have ‘material opportunities for improvements’

No.	Statement	UNIT OF ANALYSIS				THEMES										
		C-Level	CIO/ISM	ESP	Avg.	TRADITIONAL MANAGEMENT THEORY				PEOPLE				Agile		
						Planning	Organising	Directing	Controlling	IQ	E	Practical Intelligence	Partnering	EA	BIT Alignment	Innovation
2	IT engages with business leaders proactively on new ideas and system enhancements	0.31	0.34	0.26	0.30						x	X				
4	IT delivers solutions that enable organisational growth and transformation	0.49			0.49											X
6	IT participates in the engineering and continuous improvement of business processes	0.44			0.44									X		
10	IT provides timely, relevant and the right data to decision makers	0.35			0.35									X		
11	Knowledge Management assists with the development of new products and services	0.42			0.42									X	X	
12	IT contributes to the bottom line of our organisation	0.36			0.36	X	X	X	X							
13	The IT structure services the needs of our organisation	0.16			0.16										X	X
15	IT is turning business problems into opportunities	0.22	0.26	0.04	0.17									X		
16	IT is an integral part of our business	0.44	0.38		0.41										X	
18	Our organisation has a dashboard that shows employees how they perform and contribute to the achievement of the organisational goals and objectives	0.07			0.07										X	
20	When recruiting, we are looking for technical resources with a sound knowledge (acumen) of the operations of our organisation		0.34		0.34							X				
24	We communicate authentically with the business on all projects, incidents, problems and changes		0.40		0.40						X					
25	Our solutions are simple to use and draw on the same data sources across the enterprise		0.10		0.10									X		
29	Transforming business strategy into business architecture is a value proposition of IT		0.44		0.44									X		
30	IT (we) optimises, reuses, rationalises, consolidates, sustains and standardises technology and processes to timely meet business requirements in a changing environment, driving business efficiency and profitability		0.44	0.44	0.44									X		
31	IT innovation enables our organisation to stay ahead of our competitors		0.20		0.20											X
34	In Africa, 80% of all Business IT projects are delivered within the triple constraints of time, cost and quality	0.15	0.08	-0.08	0.05	x	x	x	x							
35	All IT services generate shareholder commitment while enabling benefit realisation and growth for business		0.40		0.40										X	
37	Enterprise Architecture provides the flexibility to support current and future operations while competing in a competitive world	0.47	0.40	0.38	0.42									X		
47	Our client's internal IT department knows their business strategy			0.44	0.44										X	
49	Solution merits are defined by profitable deployment			0.46	0.46	X	X	X	X							
58	Our customer has clearly defined business objectives and solution requirements, and knows what success looks like		0.34	0.30	0.32									X		
59	Our customers have clearly articulated strategic partnership strategies			0.20	0.20								X			
60	Our customer behaves in a collaborative manner			0.38	0.38						X					

(a) Management Theory

The participants are of the opinion that there are material opportunities to improve the contribution IT makes to the bottom line of the organisation. The participants also stated that IT needs to be more integrated into the business. As far as IT project delivery in Africa goes in terms of time, cost and quality, there is a need to improve the ability of the IT department to implement and deliver on business objectives. The IT department also needs to focus on aligning the IT portfolio of projects with the organisational goals to ensure the deployment of profitable IT solutions.

(b) People

According to the participants, there is room for improvement concerning the proactive engagement of IT and business leaders when new ideas and system enhancements are considered. The communication between IT and business on projects, incidents, problems and changes must also improve. There is a growing need for technical resources with a sound knowledge (acumen) of the operations of the organisation IT professionals are serving. The participants articulated that strategic partnerships need to improve and that attention must be given to the creation of a collaborative environment across all clusters.

(c) Agility

The participants are of the opinion that there is room for improvement when IT delivers solutions that enable organisational growth and transformation. IT is not participating on the required level of engineering and continuous improvement of business processes. IT needs to optimise, reuse, rationalise, consolidate, sustain and standardise technology and processes to timely meet business requirements in a changing environment, driving business efficiency and profitability. This will result in IT's ability to better service the needs of the organisation. The participants also stated that organisations need to improve their ability to monitor how well their employees perform and contribute to the achievement of the organisational goals and objectives.

According to the participants, there are many material opportunities for IT to innovate to keep their organisation ahead of their competitors. This can be achieved by creating easy to use products and drawing on the same data sources across the enterprise. The data need to be timely, relevant and accurate for decision makers. Improvements need to be made regarding the delivery of quality data.

The transfer of tacit to explicit knowledge needs to improve. Participants stated that the timely transfer of the knowledge between the clusters will assist in the development of new products.

The implementation of EA needs to improve for the IT department to be more flexible to support current and future business operations while setting a platform for business to compete in a competitive world. At the same time business strategies can be better transformed into business architecture to create improved value propositions.

The participants are of the opinion that their customers need to clearly define their business objectives and solution requirements. It is also important that the internal IT departments are better informed of their own organisation's business strategies.

iii) Pervasive material weaknesses

Six (9.84%) questions are deemed by the participants to have ***pervasive material weaknesses*** (Appendix K). The responses are grouped (Table 4.6) and reported on per theme, namely: ^(a)Management Theory; ^(b)People; and ^(c)Agility, as discussed in section 3.9.

Table 4.6: Questions deemed to have 'pervasive material weaknesses'

No.	Statement	UNIT OF ANALYSIS				THEMES											
		C-Level	CIO/ISM	ESP	Avg.	TRADITIONAL MANAGEMENT THEORY				PEOPLE				Agile			
						Planning	Organising	Directing	Controlling	IQ	B	Practical Intelligence	Partnering	EA	BIT Alignment	Innovation	
3	As an enabler of business, IT participates in business strategy formulation	0.02	-0.02		0.00							x					
8	IT personnel have the business acumen to serve our organisation	0.00			0.00					X		x					
9	IT plays a facilitators role in organisational change	0.00			0.00						X	X					
27	Coaches are assigned to employees at all levels in the organisation to drive transformation of people, processes and technology		-0.26		-0.26							X					
28	Innovation is the deployment of industry practices as a new process to our organisation		-0.12		-0.12												X
36	When referring to business, we refer to them as partners and not as clients or users		-0.02		-0.02							X					

(a) *Management Theory*

No pervasive material weakness was reported under the theme management theory.

(b) *People*

Participants indicated that IT personnel do not have the business acumen to serve the organisation. There are no coaches assigned to employees at all levels in the organisation to drive the transformation of people, processes and technology. The participants also claimed that IT does not play a facilitators role in organisational change. IT refers to business as clients or users, not as partners.

(c) *Agile*

IT does not act as an enabler of business. IT does not participate in business strategy formulation. A further weakness identified is that innovation is not deployed as a process in the organisations.

4.4.1.4 *Stage I: Findings*

The questions were all formulated as positive statements. The questions that obtained a score of less than 0.50 basis points—30 out of the 61 questions presented to the participants—were further analysed to explore and understand the factors contributing to the success of IT implementation in the African Oil and Gas industry. A summary of these questions, their scores per cluster (C-level, CIO and ESP) as well as the weighted average score per question is presented in Table 4.7.

This section groups related questions per theme (refer to section 3.9) followed by a discussion of the findings and observations. The numbers in brackets ^(**) indicate the specific statement in Table 4.3 and Table 4.7.

Table 4.7: Questions with a score of less than 50% of its weight

No.	Statement	UNIT OF ANALYSIS			
		C-level	CIO	ESP	Avg.
2	IT engages with business leaders proactively on new ideas and system enhancements	0.31	0.34	0.26	0.30
3	As an enabler of business, IT participates in business strategy formulation	0.02	-0.02		0.00
4	IT delivers solutions that enable organisational growth and transformation	0.49			0.49
6	IT participates in the engineering and continuous improvement of business processes	0.44			0.44

No.	Statement	UNIT OF ANALYSIS			
		C-level	CIO	ESP	Avg.
8	IT personnel have the business acumen to serve our organisation	0.00			0.00
9	IT plays a facilitators role in organisational change	0.00			0.00
10	IT provides timely, relevant and the right data to decision makers	0.35			0.35
11	Knowledge Management assists with the development of new products and services	0.42			0.42
12	IT contributes to the bottom line of our organisation	0.36			0.36
13	The IT structure services the needs of our organisation	0.16			0.16
15	IT is turning business problems into opportunities	0.22	0.26	0.04	0.17
16	IT is an integral part of our business	0.44	0.38		0.41
18	Our organisation has a dashboard that shows employees how they perform and contribute to the achievement of the organisational goals and objectives	0.07			0.07
20	When recruiting, we are looking for technical resources with a sound knowledge (acumen) of the operations of our organisation		0.34		0.34
24	We communicate authentically with the business on all projects, incidents, problems and changes		0.40		0.40
25	Our solutions are simple to use and draw on the same data sources across the enterprise		0.10		0.10
27	Coaches are assigned to employees at all levels in the organisation to drive transformation of people, processes and technology		-0.26		-0.26
28	Innovation is the deployment of industry practices as a new process to our organisation		-0.12		-0.12
29	Transforming business strategy into business architecture is a value proposition of IT		0.44		0.44
30	IT (we) optimises, reuses, rationalises, consolidates, sustains and standardises technology and processes to timely meet business requirements in a changing environment, driving business efficiency and profitability		0.44	0.44	0.44
31	IT innovation enables our organisation to stay ahead of our competitors		0.20		0.20
34	In Africa, 80% of all Business IT projects are delivered within the triple constraints of time, cost and quality	0.15	0.08	-0.08	0.05
35	All IT services generate shareholder commitment while enabling benefit realisation and growth for business		0.40		0.40
36	When referring to business, we refer to them as partners and not as clients or users		-0.02		-0.02
37	Enterprise Architecture provides the flexibility to support current and future operations while competing in a competitive world	0.47	0.40	0.38	0.42
47	Our client's internal IT department knows their business strategy			0.44	0.44
49	Solution merits are defined by profitable deployment			0.46	0.46
58	Our customer has clearly defined business objectives and solution requirements, and knows what success looks like		0.34	0.30	0.32
59	Our customers have clearly articulated strategic partnership strategies			0.20	0.20
60	Our customer behaves in a collaborative manner			0.38	0.38

(a) Management Theory

Statements: ⁽¹²⁾*IT contributes to the bottom line of our organisation*, and ⁽¹⁶⁾*IT is an integral part of our business*: Business and IT agree that IT is not yet fully integrated into the business model. AS a result, IT is viewed as a support function—a business view that strips them from leveraging IT as an enabler of business and a creator of competitive advantage. Mitra (2005) notes the underutilisation of IT, but argues that the role and importance of IT grow as the organisation matures.

Statement: ⁽³⁴⁾*In Africa, 80% of all Business IT projects are delivered within the triple constraints of time, cost and quality*: Participants from all three clusters agree that IT fails to deliver projects within the triple constraints of time, cost and quality. A major cause of project failure is bad planning or the lack thereof; more planning is thus required prior to project execution. An agile project management approach provides some aid to 'right planning'; however, successful projects are enabled by individuals and their interactions during the planning and execution processes. Koskela and Howell (2002) are of the view that there are fundamental failures in the existing project management theory and that the current theory fails to keep track with global change. They further argue that a successful project requires theory, practical skills and experience of the field within which the project is executed. The results of this study support Koskela and Howell (2002) in that planning, execution and management are indicated as short falls in the project management life cycle. Koskela and Howell (2002) argue that project management theory needs to be further developed, expanded on and enriched to meet future business demands. The argument and suggestions have indeed materialised and more than a decade later still remains a problem as illustrated by the results of this study.

Statement: ⁽⁴⁹⁾*Solution merits are defined by profitable deployment*: ESPs acknowledge that IT solution merits are no longer determined by price only. The creation and deployment of sustainable value and growth for business through an in-house IT department requires personnel with the right mix of practical and emotional intelligence, business experience and access to scares and critical skills through strategic partnerships. This is confirmed through statements ⁽⁴⁶⁾*Strategic partners provide access to scares and complementary skills*, ⁽⁴⁸⁾*We deliver products, services, solutions and processes that create value for our customers*, ⁽⁵⁰⁾*Strategic partnerships is a key enabler of growth for both IT and business*, and ⁽⁵⁷⁾*Our customers' technical staff are of high quality with adequate skills (including business acumen and IQ) and staffing levels*, which the participants deem as **adequate and effective** (Table 4.4). The lack of business knowledge and governance is responsible for up to 80% of project failures in organisations (Kovach & Mariani, 2012). Strategy formulation, execution oversight, governance, and control are elements of business acumen focusing on the provisioning of

direction to the organisation on the fulfilment of its mandate (Jiang & Carpenter, 2013; Bulley, Baku & Allan, 2014). Creating competitive business advantage through the enhancement of business practices is dependent on the accumulated business acumen of the organisational resources through a process of idea conceptualisation (Chan, Fung & Chien, 2013; Bulley, Baku & Allan, 2014).

(b) People

Statements: ⁽²⁾*IT engages with business leaders proactively on new ideas and system enhancements,* ⁽²⁴⁾*We communicate authentically with the business on all projects, incidents, problems and changes,* and ⁽³⁶⁾*When referring to business, we refer to them as partners and not as clients or users:* The CIO cluster agrees that IT can do more to align with business in an attempt to promote IT as an enabler of business. The ability to communicate lays the foundation for the development of trust between two or more parties. Trust leads to the formation of strategic partnerships between business and IT, which over time leads to better alignment between business and IT. Business and IT alignment is a prerequisite for organisations that aim to leverage technology to gain a competitive advantage over their rivals. Literature divides skills into technical or function specific skills, and generic or non-technical skills (Lowden, Hall, Elliot & Lewin, 2011). Although important, technical skills alone are not sufficient in a fast changing world. Employees need the ability to link technology to business problems. As a result, the demand for generic skills rises in importance. Generic skills include competencies such as cognitive abilities and interpersonal skills, including the ability to communicate (Finch, Hamilton, Baldwin & Zehner, 2013). Riebe and Jackson (2013) argue that IT professionals do not possess the generic skills to serve the needs of their employers.

Statement: ⁽⁸⁾*IT personnel have the business acumen to serve our organisation:* C-level executives are of the view that a key contributor to IT's exclusion from the business strategy formulation process appears to be IT's lack of business acumen. Considering the statements made by Dickson, Noveski and Hamidi (2011) as well as Kenyon and Sen (2012) that the necessary business acumen combined with relevant practical industry experience are needed by IT in order to service their organisations, the responses of the C-level executives are alarming. The lack of business acumen may be one of the main factors preventing IT to enable and transform the organisation. Organisations will have to educate, train and transfer business acumen to the IT human resources in order for the IT department to enable and transform the business.

Statement: ⁽⁹⁾*IT plays a facilitators role in organisational change:* C-level executives are of the view that the lack of business acumen and domain knowledge are the key reasons why

IT fails in its role as facilitator of organisational change management. As an effective change agent of organisational change in the business, IT needs to develop the ability to initiate and manage change (Wolff, 2005). For IT to develop the ability to initiate and manage change, IT human resources will have to gain business acumen and knowledge. They need the business acumen and knowledge to translate IT concepts in business terms, and *vice versa*.

Statements: ⁽²⁰⁾*When recruiting, we are looking for technical resources with a sound knowledge (acumen) of the operations of our organisation, and* ⁽²⁷⁾*Coaches are assigned to employees at all levels in the organisation to drive transformation of people, processes and technology.* Although business and IT agree that domain knowledge and EI are important competencies, IT fails to attract and appoint technical resources with a sound knowledge of the operations of their organisations or the emotional maturity to influence or change the behaviour of others. IT further fails to assign coaches and mentors to new recruits to drive transformation. To drive the required transformation, IT human resources need social competencies (Goleman, 1998) to skilfully influence the behaviours of others.

Statements: ⁽⁵⁹⁾*Our customers have clearly articulated strategic partnership strategies, and* ⁽⁶⁰⁾*Our customer behaves in a collaborative manner.* The ESP cluster is of the view that some of their customers do have a strategic partnership strategy in place, but indicates that these strategies need further development and broader adoption to give the IT department access to scarce and critical skills timely to meet the demands from business. Sourcing turned into strategic vendor management or partnering could deliver higher levels of services that support the needs of the business while reducing operational cost and time to market, enhancing innovation, and improving quality, service levels and reliability (Gartner, 2011). A true partnership requires all parties to behave in a collaborative manner. Relationship management involves teamwork and collaboration—being able to work with others towards achieving shared goals (Goleman, 1998; Goleman, Boyatzis & McKee, 2002; Wolff, 2005).

(c) Agile

Statements: ⁽³⁾*As an enabler of business, IT participates in business strategy formulation,* ⁽⁴⁾*IT delivers solutions that enable organisational growth and transformation, and* ⁽⁶⁾*IT participates in the engineering and continuous improvement of business processes:* As an enabler of business growth and transformation, the internal IT department fails to engage with business leaders proactively on new ideas and system enhancements. IT lacks the social skills to build bonds and nurture instrumental relationships (Goleman, 1998); as a result they are not invited to the boardroom to participate in business strategy formulation nor do they participate in the continuous (re)engineering of the organisation's business

processes and architecture. For IT to succeed, it needs the ability to influence, communicate, collaborate and cooperate with others in achieving shared goals (Goleman, 1998).

Statements: ⁽⁴⁾*IT delivers solutions that enable organisational growth and transformation,* ⁽¹⁵⁾*IT is turning business problems into opportunities,* ⁽²⁵⁾*Our solutions are simple to use and draw on the same data sources across the enterprise,* and ⁽²⁸⁾*Innovation is the deployment of industry practices as a new process to our organisation:* In addition, to be able to communicate clearly what success looks like and how it is measured, IT and its partners need to turn business problems into opportunities to deliver IT solutions that enable organisational growth and transformation. Poor relationships and the lack of alignment and trust will restrict IT to be agile in responding timely to the changing demands of business. This is confirmed by research done on the influence of emotions on group dynamics, occupational performance, and group effectiveness over the past three decades (Salovey & Mayer, 1990; Spencer & Spencer, 1993; Goleman, 1995; Mayer & Salovey, 1997; Goleman, 1998; McClelland, 1998; Janovics & Christiansen, 2001; Bharwaney-Orme & Bar-On, 2002; Higgs, 2004; Sala, 2006; Dries & Pepermans, 2007; Maree, Elias & Bar-On, 2008; Bar-On & Maree, 2009; Cherniss, Grimm & Liautaud, 2010).

The lack of relationships, trust and clearly defined business objectives are the root causes of complex and poorly engineered solutions, which are complex to use. EA enables the creation of tailored user experiences that enable decision makers and stakeholders across the enterprise to find more complete information faster and easier for better business outcomes. When the needs of business are known, IT can integrate solutions that support the complete business value chain without exposing business to a rigid IT structure. Business driven IT innovation is a vehicle for business to meet new realities. Creating a cooperative sharing environment in which the diverse cultures can interact and learn from each other leads to greater productivity and innovation (Finestone & Snyman, 2006).

Statements: ⁽¹⁰⁾*IT provides timely, relevant and the right data to decision makers,* ⁽¹¹⁾*Knowledge Management assists with the development of new products and services,* ⁽¹³⁾*The IT structure services the needs of our organisation,* and ⁽¹⁸⁾*Our organisation has a dashboard that shows employees how they perform and contribute to the achievement of the organisational goals and objectives:* Businesses bemoan the lack of co-operation between their different business units and the IT department, resulting in money wasted in terms of time and effort without delivering quality services or operational efficiency. Effective and efficient IT systems support business strategies and processes (Silvius, 2007). IT's none involvement in the business strategy formulation process withholds from them the opportunity to accumulate the necessary business knowledge and exposure to innovate and timely develop products and services that enable business decision makers to respond to the

macro socioeconomic demands. Alignment between business and IT strategy has a positive impact on organisational performance and has been defined as the degree to which the IT strategy, including the IT departments structure, supports or enables the achievement of the business mission, objectives and plans as documented in the business strategy (Reich & Benbasat, 2000; Hirschheim & Sabherwal, 2001; Kearns & Lederer, 2004; Chan, Sabherwal & Thatcher, 2006; Kearns & Sabherwal, 2007). Due to a lack of alignment between IT and business, IT fails to contribute positively to the corporate bottom-line.

Statements: ⁽²⁹⁾*Transforming business strategy into business architecture is a value proposition of IT,* ⁽³⁷⁾*Enterprise Architecture provides the flexibility to support current and future operations while competing in a competitive world,* and ⁽⁵⁸⁾*Our customer has clearly defined business objectives and solution requirements, and knows what success looks like:* Contributing to the prevailing disconnect between IT and business, the collected data shows that the business still believes IT is not responsible for business process (re)engineering and supporting business architecture. This is in contrast with the belief that quality design starts with building the design into the business processes. When business processes are integrated and viewed holistically they provide quality business products and services which provide greater and sustainable customer value. There is thus a direct correlation with the statement, ⁽⁶⁾*IT participates in the engineering and continuous improvement of business processes,* which explains why business reports that IT is not involved in the engineering and continuous improvement of their end-to-end business processes. When leadership combines the corporate control systems with values and cultures, they not only promote self-leadership to drive organisational and individual performance, but maximise organisational efficiency and effectiveness (Carver & Scheier, 1981; Mahoney & Thoreson, 1998; Efrat, 2014; Turro, Urbano & Peris-Ortiz, 2014). As acknowledge by all three (3) clusters, the lack of business processes and business architecture ownership contributes to inflexible and poor support structures in sustaining current and future operations. An organisation's ability to clearly articulate its business objectives and requirements while knowing what success looks like and how it is measured, provides sustainability in a competitive and changing environment.

Statements: ⁽³⁰⁾*IT (we) optimises, reuses, rationalises, consolidates, sustains and standardises technology and processes to timely meet business requirements in a changing environment, driving business efficiency and profitability.* IT is concerned about its inability to optimise, reuse, rationalise, consolidate, sustain and standardise technology and processes to timely meet business requirements in a changing environment while driving business efficiency and profitability, due to the lack of trust between the internal IT department and business. The latter is evident throughout the questionnaire, as seen from participants in the C-level cluster responses to questions that ⁽¹²⁾*IT does not contribute to the bottom line of the organisation,* and that ⁽¹³⁾*the IT structure does not service the needs of our organisation.* The

CIO cluster stated that ⁽²⁴⁾*we do not communicate authentically with the business on all projects, incidents, problems and changes*, and that ⁽³⁵⁾ *not all IT services generate shareholder commitment while enabling benefit realisation and growth for business*, while the C-level and CIO clusters agree that ⁽¹⁵⁾*IT is not turning business problems into opportunities*, and that ⁽³⁴⁾*in Africa, less than 80% of all Business IT projects are delivered within the triple constraints of time, cost and quality*. All three clusters agree that ⁽¹⁶⁾*IT is not an integral part of our business*.

The lack of trust between the IT department and business is a challenging problem and IT needs to acquire the social competencies to regain business trust in the IT department's ability to service the business objectives. As in many of the previous findings and discussions, EI plays an important role in establishing trust.

Statements: ⁽³¹⁾*IT innovation enables our organisation to stay ahead of our competitors*, and ⁽³⁵⁾*All IT services generate shareholder commitment while enabling benefit realisation and growth for business*: A lack of social competence leads to underdeveloped social skills, and this makes it impossible to build and nurture instrumental relationships (Goleman, 1998; Joseph *et al.*, 2010; Van Blerk, 2013). Without relationships, business and IT alignment is not possible. As a result, IT fails to acquire the business knowledge, insight and acumen to service, stimulate and enable their organisations to stay ahead of their competitors through innovation. In contradiction, ESPs ⁽⁵⁴⁾do believe that they *bring innovation* to their customers. It thus seems that the internal IT department fails to leverage its strategic partnership network as a business enabler for wealth creation. The lack of and need for EI is further evidential through the inability of IT to secure shareholder commitment for IT services and products directed towards benefit realisation and business growth. IT's referencing to business as clients and users is further confirmation that their relationship has not yet developed to a strategic partnership where business risks are shared and IT is seen as an integral part of the organisation and its operational models (King III, 2009; Van Grembergen & De Haes, 2010; Brooks, 2011). This is confirmed by both the C-level and CIO clusters (refer to **Appendix K**, question 16).

Statements: ⁽³⁷⁾*Enterprise Architecture provides the flexibility to support current and future operations while competing in a competitive world*: The lack of business and IT alignment (refer to **Appendix K**, question 2), IT's exclusion from participating in the strategy formulation and organisational change management processes (refer to **Appendix K**, questions 3, 6 and 9), and the fact that IT is not seen as an integral part of business, contribute towards an EA that does not provide the flexibility to support current and future operations which enable business to compete in a competitive world. Competing in a competitive world requires regular change towards operational excellence (Dreiling & Recker, 2014) as well as the

development of new capabilities (Schilke, 2014), world class operational processes (Mell, Van Knippenberg & Van Ginkel, 2014), teamwork, and the application of business acumen through a process of idea conceptualisation (Chan, Fung & Chien, 2013; Bulley, Baku & Allan, 2014).

In summary, business lacks KPIs to drive performance that contributes to the achievement of the organisational goals and objectives, while CIOs lack business acumen and domain knowledge of their organisations. The IT department is not integrated into the business, is not involved in strategy formulation, and does not deliver products and services that create value for their organisations. There is a lack of trust between the IT department and business. IT fails as an enabler and transformational agent of business. African Oil and Gas organisations do not treat IT human resources as responsible and valuable employees, and ignores the importance of EI, business acumen and practical intelligence when appointing IT personnel. Low levels of EI among staff leads to conflict and poor communication among business and IT. Poor communication leads to bad business and IT relationships. The African Oil and Gas industry fails to leverage cultural diversity for enhanced productivity and innovation.

4.4.1.5 Stage I: Conclusion

The survey revealed that traditional management (with emphasis on the classical and contemporary styles developed during the 1900's) is no longer sufficient to deal with the challenges faced by the IT industry in a fast changing world.

Participants are in agreement that business acumen, innovation, business and IT alignment, and organisational change management are some of the contributing forces that prohibit the in-house IT department to service the emerging needs of businesses in the African Oil and Gas industry. To deliver on these key focus areas (Chapter Three, Table 3.1), business requires IT employees who are emotionally well developed and qualified in their trade with sound business acumen.

Rau and Bye (2003:16-20) define the value of IT in four dimensions: expense containment, process improvement, customer advantage and talent leverage. Rau and Bye (2003) divide each dimension into three subcomponents: capital and operating expense, people, and innovation. It is the latter two subcomponents of Rau and Bye's definition that draw interest. Measuring the capital and annual operating expenses is driven by accounting rules and has its origin in traditional management. Measuring people and innovation moves the discussion beyond the well-worn path of valuing tangible assets into the area of valuing intangibles, thus challenging traditional management, which is the crux of this study.

4.4.1.6 Stage I: Headline findings

In addition to the key focus areas (Table 3.1), namely *Planning, Organising, Directing, Controlling, Intellectual Qualities (IQ), Emotional Intelligence (EI), Practical Intelligence (PI), Partnering, Enterprise Architecture (EA), Business and IT Alignment, and Innovation*, as highlighted by literature, the questionnaire responses highlighted a number of additional performance areas that influence the successful implementation of IT within the African Oil and Gas industry. These performance areas, as in the case of the key performance areas, were grouped under the common themes, ^(a)Management Theory, ^(b)People, and ^(c)Agile, to add to the richness of the data collected (Braun & Clarke, 2006). The additional performance areas identified are: *Organisational Change Management, Business Acumen, and IT as an Enabler and Transformation Agent of Business*. To deliver on these key focus areas business requires employees with the right mix of intelligence and experience who are emotionally well developed and qualified in their trade (Figure 4.2).

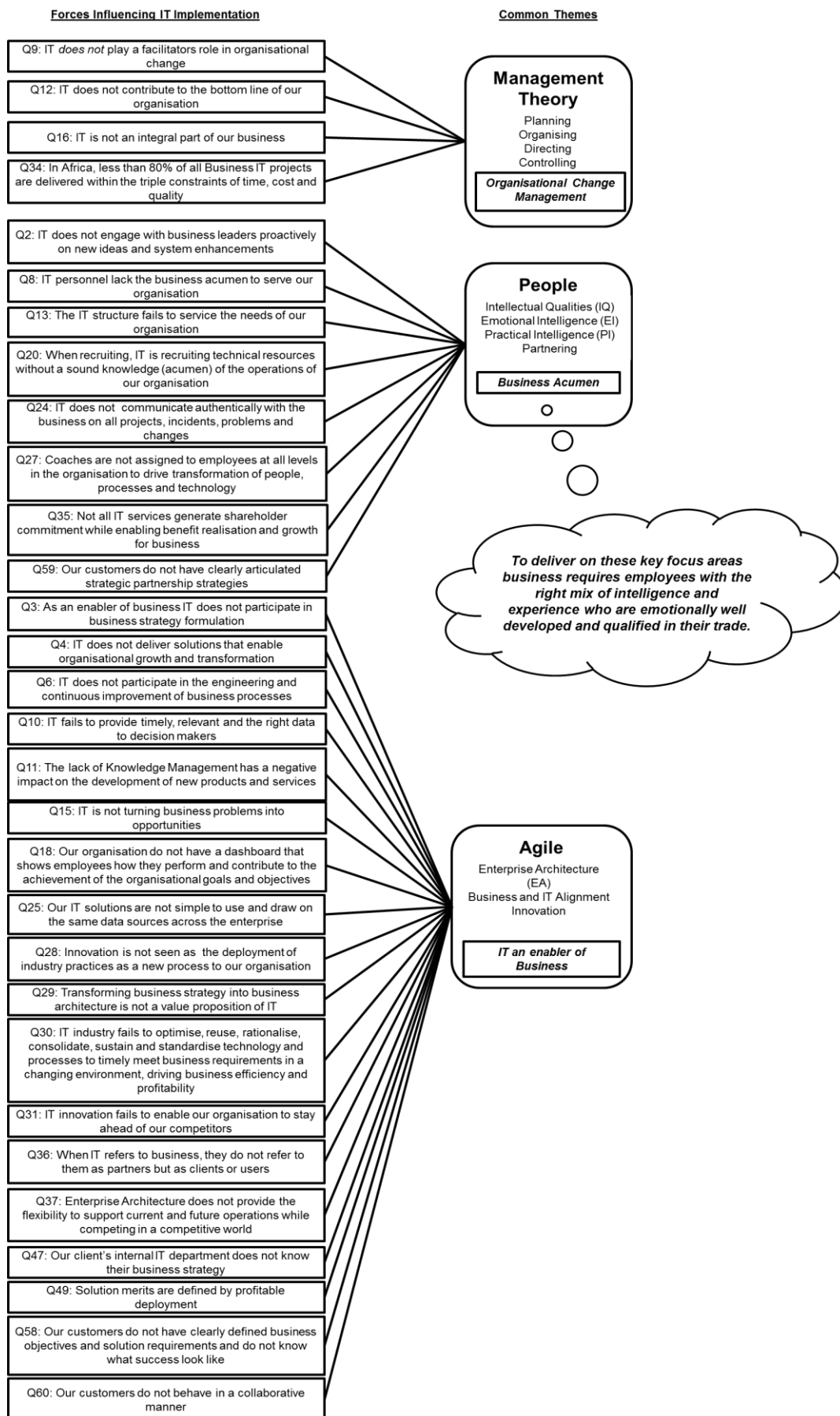


Figure 4.2: Grouping of common themes

4.4.2 Stage II – Interviews

Interviewees are of the opinion that traditional management in the African context needs to be complimented with related management competencies such as risk management to mitigate cultural dynamics, language barriers and the lack of infrastructure. Technology is changing fast and organisations are struggling to move away from the traditional KPI measurement that does not induce the right behaviour where innovation and change are needed.

4.4.2.1 Stage II: Description of sample

Sixteen (16) cases were selected for collecting qualitative data through semi-structured interviews (Figure 4.3). Nine (9) organisations participated.

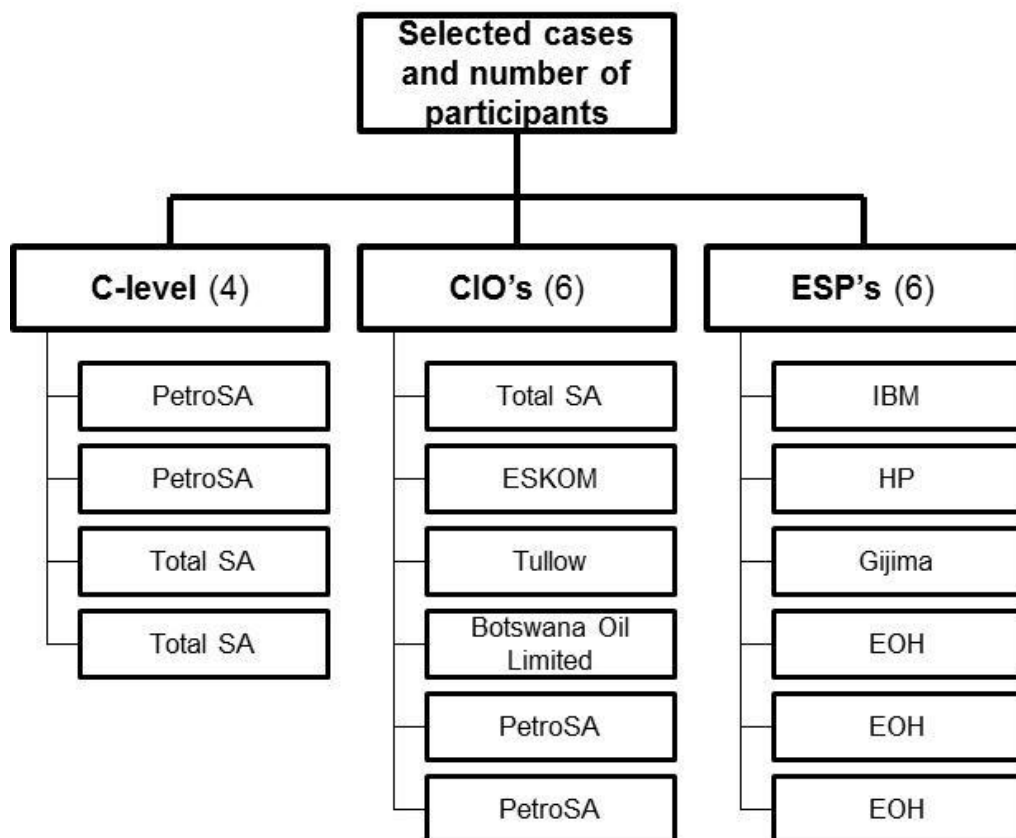


Figure 4.3: A presentation of the 16 selected cases for the interviews

Two (2) companies participated in the interviews at C-level with four (4) participants in total. Three (3) interviews were conducted: two (2) with PetroSA and one (1) combined interview with Total SA.

Five (5) companies participated in the interviews at the CIO level, with six (6) participants in total—six (6) interviews were conducted: one (1) with Total SA which was a combined interview with C-level representatives, one (1) with ESKOM, Tullow and Botswana Oil Limited each and two (2) with PetroSA.

Four (4) External Service Provider (ESP) companies participated in the interviews with six (6) participants in total: one (1) from IBM, HP and Gijima each, and three (3) from various business units in EOH. Table 4.8 provides a detailed summary of the selected cases for this stage of the study.

Table 4.8: Details summary of the selected cases – Stage II Interviews

No	Company	Name	Title	Target Population			Consent	
				C-level	CIO/ ISM	ESP	Ind.	Comp.
1	PetroSA	Andrew Dippenaar	Vice President: New Ventures Upstream	X			Yes	Yes
2	PetroSA	Faizel Mulla	Strategy Manager	X			Yes	Yes
3	Total SA	Nazlee Rajmohamed	Chief Financial Officer	X			Yes	Yes
4	Total SA	Wayne Kaak	Finance and IS Business Support	X			Yes	Yes
5	Total SA	Frederique Simonnet	IS Manager		X		Yes	Yes
6	ESKOM	Sal Laher	Chief Information Officer		X		Yes	Yes
7	Tullow	Andrew Marks	Chief Information Officer		X		Yes	Yes
8	Botswana Oil Limited	Galeboe Mmelesi	ICT Manager		X		Yes	Yes
9	PetroSA	Bheki Malinga	IS Business Relationship Manager		X		Yes	Yes
10	PetroSA	Sello Lehong	IS Technology and Architecture Manager		X		Yes	Yes
11	IBM	Richard Downing	Business Development Manager			X	Yes	Yes
12	HP	Sandra Solomon	Strategic Business Executive Enterprise Services – South Africa			X	Yes	Yes
13	Gijima	Theo Hattingh	Chief Client Officer: Industrial			X	Yes	Yes
14	EOH	Dexter Roniger	Account and Business Development Manager: Oracle Services			X	Yes	Yes
15	EOH	Johannes Petrus (Clydie) Cronje	Operations Director: Microsoft Coastal			X	Yes	Yes
16	EOH	Brian Desmond Harding	Managing Director: Microsoft Coastal			X	Yes	Yes

4.4.2.2 Stage II: Analysis

Three research questions, each consisting of a number of sub-questions (Research Questions 1 and 2 have four sub-questions each and Research Question 3 has three sub-questions), thus eleven questions in total, were asked to participants. The following section discusses the responses of each cluster (C-level, CIO and ESP) per sub-question with corresponding findings. This is followed by the stage conclusion and headline findings.

- i) **Stage II: Research Question 1:** *What are the complexities of IT implementations within organisations?* The **objective** of the question is to determine and understand the driving forces and the variables between traditional management and other theories required for successful IT implementation.

The following sub-questions were formulated and are directed towards answering Research Question 1.

Sub-Question 1.1: What role does traditional management theories play in IT implementations? The *objective* of the sub-question is to determine the variables between traditional management theories and those required for successful IT implementation.

➤ **Analysis: C-level Cluster**

Traditional management is necessary but not sufficient in its current form. Nazlee Rajmohamed indicted that “traditional management theories need to be more robust” (**Appendix N-3:2**). This is supported by Faizel Mulla who stated that “traditional management theories are old, they need to be debugged” (**Appendix N-2:2**). In addition, traditional management fails to provide for the rapid change in technology and business requirements to keep organisations agile and relevant to compete and survive in a competitive economy. Andrew Dippenaar stated that he does not think “that the traditional role of planning and organising really caters for the pace at which these changes happens” (**Appendix N-1:3**).

Organisations are run following inundated and old business rules which lack systems thinking, to bring together the different parts of the business to operate in an integrated manner. Management theory should serve as the building blocks to enable leaders to build bridges between individuals from different backgrounds, cultures, values, believes and trades. Faizel Mulla said that “companies are run ... very linear, they aren’t thinking and follow very old rules”. Faizel Mulla concludes by saying that companies do not apply “systems thinking” (**Appendix N-2:2**).

Transforming the business from its present state to its future state requires that the organisation instils a common business language to drive sustainable value through the complete organisational value chain. Nazlee Rajmohamed said that business and IT are talking “two different languages” (**Appendix N-3:3**).

➤ **Analysis: CIO Cluster**

Traditional management still plays an important role in IT implementation, but on its own it is not sufficient. Traditional management needs to be complimented by other competencies that provide the required structure to create value for the organisation, innovate in an agile fashion to ensuring alignment of the business needs with new socioeconomic demands, empower IT to lead business from the front through innovative and enabling business solutions as opposed to responding to request, while leading and developing people to maximise their contribution to the bottom line. Sal Laher said that “we are seeing them evolve to using more agile and more dynamic type[s] of planning, organising and directing, based on where the world is going” (**Appendix N-4:3**). This is supported by Bheki Malinga who said that IT needs to develop the ability to “innovate to ensure that there is alignment with the demands of the current business needs or the new economy needs” (**Appendix N-7:3**). Sello Lehong stated that management theory should “structure an organisation in such a manner that you provide value in line with the expectations of the organisation”, something that traditional management theory fails to do (**Appendix N-8:2**).

➤ **Analysis: ESP Cluster**

Traditional management informs the IT management philosophy with an overlay of individual experiences on top of it to make it relevant to the specific situation. Traditional management within IT history did not provided for IT and focused on business management only. Going forward, management should adapt to support a business environment where IT operates as an enabler of business by optimising business processes, while improving the time-to-market, agility, scalability, and reduce complexity of enabling IT products and services. Dexter Roniger stated that management should be “combining both parties into one holistic project team” (**Appendix N-12:2**). IT products and services should be built in support of the organisational strategy. Management for IT further needs to be amended to provide for the rapid change in business priorities. Theo Hatting stated that traditional management is “not flexible enough to deal with changing business priorities” (**Appendix N-11:2**).

➤ **Sub-Question 1.1: Findings**

Traditional management lacks systems thinking and fails to integrate the organisation. Business and IT are not aligned and talk different business languages. IT products and

services do not provide for rapid changes in business priorities. IT lacks innovation to lead the business through change.

Traditional management in IT is necessary but not sufficient in its current form. It fails to provide for the rapid change in technology and business requirements to keep organisations agile and relevant to compete and survive in a competitive economy.

As an enabler of business, complimenting IT management with the required management competencies provides the structure to create value for the organisation. Innovating in an agile manner ensures alignment of the business needs with new socioeconomic and environmental demands, allowing IT to lead business from the front through innovative and enabling business solutions as opposed to responding to request, thereby maximising IT's contribution to the bottom line (Dreiling & Recker, 2014; Schilke, 2014).

Sub-Question 1.2: How do relationships within IT and IT teams influence IT implementations? The *objective* of the sub-question is to determine the effect relationships have on the agility of the internal IT department.

➤ **Analysis: C-level Cluster**

Business needs to own and drive their IT requirements for increased stakeholder value, while IT serves as the enabler of business. Faizel Mulla states that “business needs to drive the requirements of what IT should be doing for them” and continues by saying that “IT should be an enabler” of the business (**Appendix N-2:3**). Nazlee Rajmohamed adds that “the face of the project is business” although the project is implemented by IT (**Appendix N-3**). IT architectures should be flexible to deliver on the changing and evolving requirements of the business. Faizel Mulla said that IT “know[s] what business is all about” (**Appendix N-2:3**).

The maturity of the IT and business relationship needs to be determine by the ability of IT and the business to talk and listen to each other. In addition, the relationship between IT and the business needs to be bi-directional and be built on trust. Andrew Dippenaar stated that relationships “are very influential” and that “it is that mutual understanding of what is happening on both sides of the fence that is crucial and that you can only do with good relationships” (**Appendix N-1:3-4**). Business and IT need to understand each other's strengths and weaknesses, working together (with clearly defined roles and responsibilities) in addressing the present and the future business requirements. Wayne Kaak stated the importance of understanding the roles of stakeholders during IT implementation “and to allow that person to function within that role” (**Appendix N-3:4**). A successful relationship requires high levels of EI, intellectual qualities and work-life experience from both IT and business.

➤ **Analysis: CIO Cluster**

Key to highly effective teams is good communication, collaboration and mutual trust. Sello Lehong stated that “communication is central in making sure that all stakeholders are given a full appreciation of the complexities, the benefits and the value of IT implementations” (**Appendix N-8:3**). Clear communication aligns business and IT stakeholders and keeps them connected during the implementation process. Bheki Malinga stated that alignment between business and IT “results in a better implementation of IT solutions” (**Appendix N-7:3**). This should be supported by clear objectives, clearly defined user requirement specifications, and clearly defined and well understood stakeholder roles and responsibilities. Engaging IT early helps IT to understand the changing business environment faster, and its impact on business and its resources (including people). Bheki Malinga said that involving IT early in the business change process “makes projects easier to implement” (**Appendix N-7:3**). Sal Laher mentioned that IT “projects fail because of relationship and because of the change management was absolutely none existent or poor” (**Appendix N-4:3-4**).

The right business acumen helps IT to align with the business needs and processes. Frederique Simonnet said that due to the lack of business acumen on the part of IT, “it is key to have some people from the business in some topic like change management and training and ownership, because IT experts really see it from IT’s side, but the business see[s] it in total” (**Appendix N-3:4**).

➤ **Analysis: ESP Cluster**

Teaming provides team members with security and purpose. Purpose provides for individual ownership that allows for the early identification and mitigation of problems and risks before it has a destructive impact on the organisation. Richard Downing said that “professionalism calls it early. The earlier you call it, the earlier you can fix it, resolve it without impacting the overall project” (**Appendix N-9:2**). Effective teaming is built on open and transparent communication. Brian Desmond Harding stated that “if you look at where a project goes wrong, it is seldom about the technology; it is more about the communication around that and you know one could then say the relationships” (**Appendix N-14:3**). Projects often fail because of poor communication that frequently leads to a deterioration of the relationship between business and IT.

Effective teams understand that all people are not the same. A team finds its strength in the diversity that the individual team members bring to the team and their ability to address conflict upfront. Dexter Roniger said that as a leader, “you do have to work with people and you have to understand that people were not all the same” (**Appendix N-12:3**).

Collaboration is synonymous with teamwork. Teamwork allows for organisational wide integration and is a platform for innovation for organisational competitive advantage.

Strong partnerships, as an element of teamwork, provide access to scarce and critical skills and competencies in a changing environment.

Strong leadership ensures that teams are aligned with the organisational strategy, goals and objectives. Theo Hatting stated that “systems and architectures of enterprises today are highly integrated environments and it is essential that teams work well together in a team dynamic where [the] best of the team dynamic in its variations are leveraged and taken advantage of” (**Appendix N-11:3**). Leadership needs to be firm and avoid taking up the role of the nurturing parent. They need to deal with difficult employees timely and apply corrective action when needed to ensure the team remains aligned with the organisational objectives.

➤ **Sub-Question 1.2: Findings**

There is a lack of trust between business and IT. Business fails to own and drive the automation of their business processes. Business and IT do not collaborate towards a common goal, while IT lacks business acumen. Organisations fail to leverage cultural diversity to create a competitive advantage.

Effective teaming is built on open and transparent communication. Projects often fail due to poor communication which leads to a deterioration of the relationship between business and IT.

Strong leadership ensures that teams are aligned with the organisational strategy, goals and objectives. There is a lack of strong leadership and business and IT teams are not aligned to collaborate towards a shared vision and common goals to improve organisational performance (Chan, Sabherwal & Thatcher, 2006; Kearns & Sabherwal, 2007; King III, 2009; Brooks, 2011; De Haes & Van Grembergen, 2015).

Teamwork allows for organisational wide integration and is a platform for innovation for organisational competitive advantage. The lack of teamwork leads to business and IT driving different objectives, dividing the organisation, slowing progression and neutralising competitiveness (Bergman *et al.*, 2012; Murphy & McMillan, 2013; Wang, Waldman & Zhang, 2014).

Strong partnerships, as an element of teamwork, provide access to scarce and critical skills and competencies in a changing environment. Partnerships are not strong, resulting that the IT department falters the organisation in driving competitive differentiation while limiting the

IT department's access to scarce and complementary skills, slowing down innovation (Corsaro *et al.*, 2013; Chan, Fung & Chien, 2013; Bulley, Baku & Allan, 2014).

Effective teams understand that people are not all the same. Management ignores the power of cultural diversity, weakening their teams by not leveraging the strengths that the individual team members with diverse backgrounds bring to the team (Kotter & Heskett, 1992; Peterson, 2003; Finestone & Snyman, 2006; Sun & Chen, 2006; Smit *et al.*, 2011).

Leadership needs to be firm and avoid taking up the role of the nurturing parent. They need to deal with difficult employees timely and apply corrective action when needed to ensure the team remains aligned with the organisational objectives.

A successful relationship requires high levels of *EI*, *intellectual qualities* and *work-life experience* from both IT and business. The EI levels seem to be low with limited work-life experience in IT and business.

Sub-Question 1.3: How does the IT department contribute towards sustainable stakeholder value in a changing environment within the context of traditional management approaches? The *objective* of the sub-question is to identify the driving forces behind successful IT implementation.

➤ **Analysis: C-level Cluster**

IT delivers sustainable value by being flexible (innovative and creative) and adaptive to change, with strategies broken-up into manageable components that deliver incremental and sustainable value to the business which can be changed when a change occurs in business demand or technology requirements. Faizel Mulla mentioned that business management should “ensure that their people, processes and technologies are designed in such a way that it is of a sustainable nature and there is not an act against the value that nature calls” (**Appendix N-2:4**), while Nazlee Rajmohamed stated that “we have to bring innovation and creativity into our management philosophies” if we want to deliver sustainable value (**Appendix N-3:4**) In addition, IT needs to be aligned and familiar with the environment that they are servicing, with the right mix of business acumen and experience of the core business operations. Andrew Dippenaar said that the IT department needs to be “fully familiar and being up to date with what is happening in its specific user community” to deliver sustainable stakeholder value (**Appendix N-1:5**).

The success rate of IT implementations increases when business reaches out and engages with IT to participate in the requirements formulation and solution selection phases of the implementation project. Andrew Dippenaar mentioned that “the user community itself must

also be able to engage constructively with the IS department” (**Appendix N-1:5**). This ensures the sustainability of the IT products and services post implementation. Wayne Kaak said that sustainability “resolve[s] around supporting the needs of the organisation” (**Appendix N-3:5**).

➤ **Analysis: CIO Cluster**

Sustainable value is delivered through the continuous integration and alignment of the IT strategy with the business strategy. Bheki Malinga mentioned that to “deliver stakeholder value on an on-going basis is to continuously align your strategy as IT with the changing strategy of business” (**Appendix N-7:4**). An understanding of the business requirements leads to continuous engagement between business and IT. Galeboe Mmelesi said that “constant and effective communication and collaboration between what the IT department has been targeted to do and the business organisation” contributes to the delivery of sustainable value in a changing environment (**Appendix N-6:3**). Teamwork and an adaptive execution methodology that supports the rate of change is core in meeting the enterprise requirements. Frederique Simonnet stated that “demands are changing so fast, we need to be able to manage the traditional way together with agility” (**Appendix N-3:5**). Teams, representing skills and competencies from different complimenting disciplines—from both IT and the business—are necessary to deliver on the fast changing business objectives.

Communication and collaboration align organisations and improve performance. Sello Lehong mentioned that by doing “a small part of planning... you move on to the next part of execution and implementation. You create small successes but regular[ly] repeated and you build on those success[es]”. Business and IT align through the creation of sustainable value creation (**Appendix N-8:4**).

Through innovation, IT improves business efficiency and stimulates growth. Andrew Marks said that innovation “drives and triggers change”, which requires holistic thinking by business and IT to link “people, process and technology” (**Appendix N-5:3**).

➤ **Analysis: ESP Cluster**

Sustainable stakeholder value is ensured when IT is strategically positioned in the organisational structure to detect new business thinking early, allowing them to analyse the new business thinking, determine the impact on the business model, and propose innovative and alternatives solutions upfront. Brian Desmond Harding stated that for IT to deliver on the demands of business, “they have to be a part of the business” (**Appendix N-14:3**). By listening to the stakeholders and understanding their business requirements, IT is enabled to deliver consistent incremental value which is relevant and non-disruptive to the business.

Sandra Solomon said that IT needs to remain “abreast with ^(a)the business requirements, and ^(b)the industry trends” (**Appendix N-10:3**). It allows IT to remain up-to-date with the organisational requirements and industry trends, evolve with the changing dynamics within the business and industry, explore different options, and deliver innovative solutions to business that attract investors and allow for growth. Brian Desmond Harding said that “IT needs to be involved in those upfront discussions and very often the involvement in those upfront discussions can save the business a lot of money” (**Appendix N-14:3**).

Communication allows for the flow of information through the different levels of the organisation. Collaboration informed by the flow of information leads to efficient and improved business processes. Dexter Roniger said that “business and IT have to become more of a team than an opposing force” (**Appendix N-12:3**).

Involving business during the requirement formulation, solution selection, development and implementation leads to the continuous improvement of related business processes, while delivering manageable change in bite-sized chunks more frequently to avoid business disruption. Dexter Roniger stated that business should have “far more influence in things like the definition of your requirements, selection processes and in fact the implementation of the solution” (**Appendix N-12:3**).

Theo Hattingh said that “unfortunately, business still sees IT as a cost centre and not as a business enabler. To leverage IT as an competitive advantage IT need[s] to be part of the development, implementation and ongoing adjustment of the organisational strategy and the alignment of the IT strategy accordingly” (**Appendix N-11:3**).

➤ **Sub-Question 1.3: Findings**

There is poor collaboration between business and the IT department. The IT department lacks innovation and creativity. The IT department lacks business acumen and business domain knowledge. The IT strategy is not aligned with the business strategy.

The IT department delivers sustainable stakeholder value in a changing environment through the continuous integration and alignment of the IT strategy with the business strategy. The inability of the IT department to align their strategy with the business goals and objective destroys stakeholder value as the business is unable to use technology to predict the future in a changing environment (King III, 2009; Van Grembergen & De Haes, 2010; Brooks, 2011; Stehlik, 2014).

Not listening to the stakeholders to understand their business requirements upfront results in the over-engineering and misalignment of IT products and services, has a disruptive impact

on business, and destroys value (Brynjolfsson, 2011; Corsaro *et al.*, 2013; Kwok, 2014; Trienekens, Kusters & Cuenca, 2014; De Haes & Van Grembergen, 2015). An understanding of the business requirements leads to continuous engagement between business and IT. It further allows IT to remain up-to-date with the organisational requirements and industry trends, to evolve with the changing dynamics within the business and industry, to explore different options, and to deliver innovative solutions to business that attract investors and allow for growth.

Business sees and treats IT as a cost centre and not as an enabler and transformational agent of business (Luftman & Kempaiah, 2007; King III, 2009; Manfreda & Štemberger, 2014). “To leverage IT as an [sic] competitive advantage, IT need[s] to be part of the development, implementation and ongoing adjustment of the organisational strategy and the alignment of the IT strategy accordingly” (Hattingh, 2014). With the right mix of technical and business competencies (Luftman & Kempaiah, 2007) as well as practical experience and EI, the IT department can transform from an enabler of business to a transformer of business.

Sub-Question 1.4: Why does the application of traditional management not deliver successful IT implementations? The *objective* of the sub-question is to determine the effect traditional management theories have on the agility of the internal IT department.

➤ **Analysis: C-level Cluster**

Traditional management does not allow for innovation, systems thinking or change management. Nazlee Rajmohamed said that business management only recently acknowledged “that there is a concept of change management” which did not exist in traditional management (**Appendix N-3:5**). This is supported by Andrew Dippenaar who said that management are challenged with new “complexities and that is the rapid rate of change” which hinders “progressive elaboration” (**Appendix N-1:5**). It supports rigidity and does not allow for agility. Traditional management ignores factors that could result in changes to the original strategy; as a result, IT is not allowed to make changes to the original plan without the approval of business, or the business fails to inform IT of such changes. Nazlee Rajmohamed mentioned that a “human being’s first response to change is to resist” change and the impact thereof on value creation (**Appendix N-3:5**).

Poor relationships between IT and business lead to mistrust, to the extent where IT becomes an order taker where they are told what to do, and is not treated as an enabler of business.

➤ **Analysis: CIO Cluster**

Business requirements are not clearly defined; as a result, not enough time is spent to ensure all possible business scenarios are explored before rushing into an automation initiative that is misaligned with the business requirements, resulting in the implementation of multiple interruptive changes. Bheki Malinga stated that in his experience, “the lack of delivery of successful IT implementations stems mostly from ill-defined requirements” (**Appendix N-7:4**). Andrew Marks mentioned that “traditional management theory very often underestimate[s] significantly the business change component” and completely ignores the human factor (**Appendix N-5:3-4**). The interruptive changes build resistance as employees become insecure, while the relationship between IT and business deteriorates.

Doing things right the first time requires employees to possess high levels of intellect, experience and emotional intelligence to guide the business through transition. Andrew Marks said that EI is a competency that business and IT management “need to demonstrate” to deliver successful IT implementations (**Appendix N-5:4**). Technical competencies alone do not secure successful IT implementation because of the human element involved. Bheki Malinga emphasised the importance of “business acumen” when servicing the requirements of business (**Appendix N-7:5**). EI is therefore a critical competency to drive and facilitate business change.

IT needs to lead the organisation and its employees to realise the value of transformation in the digital era, making them feel secure and save. Sal Laher stated that “in the 21st entering the 22nd century, the technology is so pervasive of the businesses that technology is so important to deliver, and that is what those traditional management theories do not apply in the 21st century” (**Appendix N-4:5**). Successful change requires time, trust, communication and collaboration at all levels in the organisation. Mitigating the fear manifested through behaviour, management needs to sell the value of change to employees early to secure their buy in and ownership.

The rate of implementing new products and services has a direct impact on organisational competitiveness. Sello Lehong states that the go-to-market rate of IT products and services has a “direct impact on the organisational competitiveness” (**Appendix N-8:6**).

➤ **Analysis: ESP Cluster**

Richard Downing said that “traditional management theory tends to drive and focus on KPIs that does [sic] not induce the right behaviour” (**Appendix N-9:4**). IT implementations fail because IT lacks agility and flexibility to evolve with the changing business requirements. As an enabler of business, IT does not connect with business at the right organisational level,

while IT continues to operate in isolation when choosing and developing new business solutions. IT and business need to develop a culture of collaborative partnering. Dexter Roniger stated that “if IT is an island on its own providing a service to business, and business is not involved, I don’t think you are going to have a successful project. At the end of the day ultimately IT is an enabler” (**Appendix N-12:4**). This is supported by Brian Desmond Harding who said that “the common thread is how closely the business and IT are aligned, so if business and IT are operating according to traditional management methods but in isolation you will not get the kind of delivery that you are looking for” (**Appendix N14-4**).

EA maximises the organisational return on investment by directing the development of solutions that maximise and utilise all IT assets, minimising the complexities of interfaces while mitigating the business risks. EA provides the organisation with agility, flexibility and scalability for growth.

The lack of agility in traditional management theory is limiting an organisation’s ability to progress, be forward thinking, and to innovate. Theo Hattingh said that “traditional management theory is not flexible enough to deal with fast changing business requirements” (**Appendix N-11:4**). Organisations need to move from traditional into a new style of thinking (culture) to find new ways of doing things. Dexter Roniger said that “it’s got to be an attitude change on both sides; it’s got to be more of a partnership” (**Appendix N-12:4**).

Often leadership in power lacks the vision, appetite and hunger to do things differently and as a result fails to act as a change agent to transform the organisation to keep it current, relevant and profitable.

Business does not understand the complexity of IT and the application thereof as an enabler of business.

➤ **Sub-Question 1.4: Findings**

Traditional management does not allow for innovation, systems thinking or change management; it supports rigidity that does not allow for agility (Finestone & Snyman, 2006; Grobler *et al.*, 2006; Nayar, 2010; García-Muñiz & Vicente, 2014). Organisations fear change caused by technological innovations and inventions. The fear for change causes a breakdown in the IT and business relationship, leading to mistrust. Poorly defined requirements have a disruptive impact on business. Not enough time is spent on defining and understanding the business requirements. Business and IT lack EI to drive business change. Organisational KPIs do not induce the right organisational behaviour in a changing business environment. Organisations do not leverage EA to facilitate business change.

Business requirements are not clearly defined; as a result, not enough time is spent to ensure that all possible business scenarios are explored before rushing into an automation initiative that is misaligned with the business requirements, resulting in the implementation of multiple disruptive changes, which build resistance as employees become insecure (Maurer & Lechner, 2014).

IT is failing to respond to the rapid rate of change to create a competitive advantage for business (Van Grembergen & De Haes, 2010; Brooks, 2011; Stehlik, 2014). Cummings and Vorley (2013) state that all organisations are open systems and not just a series of unconnected parts. Change therefore requires time and can only be done through trust, transparency, communication and collaboration at all levels in the organisation.

IT does not connect with business at the right organisational level and continues to operate in isolation when choosing and developing new business solutions (Ehlers & Lazenby, 2007; Agha, Alrubaiee & Jamhour, 2012; Chouhan & Srivastava, 2014). IT and business need to develop a culture of collaborative partnering.

Business progression and the ability to compete globally are hindered by rigid business and IT processes (Tallon & Pinsonneault, 2011). The lack of agility in traditional management theory is limiting the organisation's ability to progress, be forward thinking, and to innovate. Organisations need to move from traditional into a new style of thinking (*culture*) to find new ways of doing things more efficiently and effectively.

Business does not understand the complexity of IT and fails to leverage technology as a business enabler (King III, 2009; Brooks, 2011; Valtakoski, 2015).

ii) Stage II: Research Question 2: *Why do IT professionals find it difficult to respond to the demands of business in a traditionally managed environment?* The **objective** of the question is to determine and understand what competencies are needed by IT professionals to satisfy the organisational IT service delivery demands in a changing environment.

The following sub-questions were formulated and are directed towards answering Research Question 2.

Sub-Question 2.1: How do management competencies affect the IT department's ability to deliver successful IT implementations? The *objective* of the sub-question is to establish the management profile and attitudes for successful IT implementation.

➤ **Analysis: C-level Cluster**

Management competencies assure that the organisation delivers value in accordance with its strategy. Andrew Dippenaar stated that every decision management makes “need[s] to be thought through in a structured manner” to ensure all IT implementation options are considered (**Appendix N-1:7**). This is supported by Faizel Mulla who added that management needs “understanding of the entire business process” (**Appendix N-2:5**), and Wayne Kaak who stated that “the strategy of the global organisation has an effect on the information that they give to IT” (**Appendix N-3:7**). It sets a common business language and values. Management competencies create capacity, alignment and enable collaboration across the organisation to work towards a common goal. Nazlee Rajmohamed stated that management competencies should ensure that IT “deliver[s] something” of “value to the business” (**Appendix N-3:6**). It facilitates the organisational change management process and controls the impact of change on people, processes and technology.

➤ **Analysis: CIO Cluster**

Management competencies promote levels of accountability, and develop and improve the individual maturity levels of the team members. A mature workforce delegates responsibilities; this builds trust, provides for regular feedback, and promotes collaboration across all levels in the organisation. Galeboe Mmelesi stated that “the more willing the leadership is, the more they are willing to enable IT to communicate with them to share with them experiences and advise on what is possible” (**Appendix N-6:4**).

Management competencies deal with complex relationships, multiple cultures and organisational diversities. Sello Lehong stated that the complexity “of relationships that the IT management has to deal with creates a huge competency gap” (**Appendix N-8:6**). It works with different management styles, behaviours, cultures and emotional demands. It develops and stimulates the organisation’s emotional intelligence levels.

Management competencies set the scene for openness, transparency and trust—it creates organisational culture. Andrew Marks stated that “it is the relationship between IT leadership and business leadership which will ultimately lead you towards the business benefits” (**Appendix N-5:4**).

➤ **Analysis: ESP Cluster**

Management competencies provide the governance framework for decision making and set the rules for execution. Brian Desmond Harding said that “traditionally in IT you do not have strong management characteristics” (**Appendix N-14:5**). It sets vision, and vision directs

execution. The execution strategy informs the people strategy, which identifies the skills and competencies required by the organisation. It sets the right key performance indicators to drive efficiency and effectiveness which leads to sustainable alignment, customer satisfaction and higher profits. Dexter Roniger said that “you’re not going to have a good relationship if IT, who are the architecture enablers, are providing poor performance” (**Appendix N-12:5**).

Management competencies assist IT in understanding the business needs and how best to support the business process and objectives. Theo Hattingh said that “the understanding of business and how IT would support business process and the business objectives is absolutely key” (**Appendix N-11:4**). It assists building relationships and cross functional execution teams. Reliability, trustworthiness and performance are key elements for sustainable relationships. Management competencies prove useful with the assignment of responsibilities. It sets the platform for business to take ownership of related deliverables while IT shares ownership with and working side-by-side with business in resolving related business problems.

Having a CIO sitting on the Board and EXCO allows the organisation to leverage IT as an enabler and as a competitive advantage.

➤ **Sub-Question 2.1: Findings**

Management does not understand the end-to-end business processes. Management fails to create a common business language. Management fails to create a cohesive and collaborative culture working towards a common goal. Management fails to delegate and build trust. Management fails to leverage organisational diversity to enhance performance. Management fails to implement KPIs that drive business efficiency and effectiveness across the organisation. Management does not clearly communicate its business requirements to the IT department.

Lack of trust between business and IT has a negative effect on the IT department’s ability to deliver successful IT implementations. Management competencies promote levels of trust and accountability, while it develops and improves the individual maturity levels of the team members (Baiden & Price, 2011; Nelsey & Brownie, 2012). A mature workforce delegates responsibilities which build trust, provide regular feedback, and promote collaboration across all levels in the organisation. It allows for dealing with complex relationships, multiple cultures and organisational diversities. Management competencies work with different management styles, behaviours, cultures and emotional demands (Van Rensburg, 2014). It develops and stimulates the organisation’s emotional intelligence levels.

Management competencies set the scene for openness, transparency and trust (Schroeder, Bahn-Henkelman and Henkelman-Bahn, 2012). It creates an organisational *culture* which provides the governance framework for decision making and set the rules for execution and performance standards.

Management competencies set the right key performance indicators to drive efficiency and effectiveness, which leads to sustainable alignment, customer satisfaction and higher profits.

Sub-Question 2.2: Why are technical skills not sufficient for successful IT implementations?

The *objective* of the sub-question is to determine what patterns emerge in terms of the Practical Intelligence of selected IT professionals.

➤ **Analysis: C-level Cluster**

Technical skills are insufficient for successful IT implementations because without business acumen, IT is not able to deliver fit-for-purpose solutions that can scale to accommodate future business requirements. Andrew Dippenaar stated that without business acumen, IT might deliver “a wonderful technical solution” that is “not accepted by your user community” because it is not user friendly “from the user perspective” (**Appendix N-1:8**). In addition, IT needs people skills to negotiate, sell technical solutions to the business, get user buy-in, innovate, plan and manage change.

➤ **Analysis: CIO Cluster**

Technical skills alone will not ensure successful IT implementation because the values of IT are imbedded into the business processes. Bheki Malinga said that for successful IT implementation, “you actually need an engagement” which relates to the ability to connect emotionally with the business. Bheki Malinga continued to say that “the value of IT now is in the understanding of the business processes and how technology is used to enable business” (**Appendix N-7:7**). An analysis of the business processes allows for the alignment of technology to serve as an enabler of business.

IT implementation touches organisational culture and competencies which impact the organisational structure, thus touching the social environment of the organisation. Sello Lehong stated that “IT implementation actually touches on the rest of the organisation in as many different forms that you could actually found” (**Appendix N-8:7**). It affects the way people behave, which could lead to resistance. Sello Lehong said that “powers will shift and influence will shift as a result of” IT implementation (**Appendix N-8:7**). Managing behaviour requires people skills and high levels of emotional intelligence. Galeboe Mmelesi stated that we require a “technical implementer to understand the impact to business” that IT

implementation has on them (**Appendix N-6:4**). This is supported by Frederique Simonnet who stated that IT will “implement things without knowing what the things are used for” (**Appendix N-3:7**).

An overreliance on original equipment manufacturers (OEM's) of IT products and services prevented Africa from building the required managerial and experimental competencies to manage and position IT as an enabler of business on the African continent. Historically this has led to a view that IT management was not a critical competency and as such was never considered as part of the business curricula.

➤ **Analysis: ESP Cluster**

Technical competencies alone deny IT the ability to interact with business, understand their requirements, and align IT with the organisation's strategic objectives. Richard Downing stated that “it is the ability to interact that understands and aligns with the business requirements and the business, and understands the strategic objectives that we are trying to achieve” (**Appendix N-9:5**). In successful IT implementation, emotional and practical intelligence are key competencies in acquiring and deploying fit-for-purpose business solutions.

Business also seems to lack emotional competencies as timely feedback to IT regarding change business requirements and objectives remains problematic. Richard Downing said that “no feedback is a symptom and that is where management and traditional management theory fails because where did you ever learn who must be monitoring feedback?” (**Appendix N-9:5**). Without feedback, IT is not adapting its solutions to meet the changing business requirements. Emotional competencies connect people from different backgrounds, experiences, abilities and competencies to create a competitive advantage. Johannes Petrus Cronje said that for successful IT implementation, you need a “person that takes the responsibility and ownership and the rest falls underneath that person, and that person as I said has to have a personality, the ability to lead, the ability to encourage other people and be able to properly lead them technically etc., and he needs to be respected” (**Appendix N-13:8**). People with a high EI recognise their own roles and those of others and the value they are contributing.

As an artefact of communication, feedback is critical to building a winning team, winning solutions and competitive advantage. Feedback further signifies the maturity of the business and IT relationship.

The ability to communicate and listen to each other allows for business and IT to develop a shared vision and strategy and innovate new business solutions. Allowing for everyone's

opinion to be listened to is strengthening collaboration. The collaboration between business and IT allows for better time-to-market, speed, and return on investment, which are pre-requirements for successful IT implementation. It unites business through diversity, joining people of different skills to present better results.

In closure, successful IT implementation requires IT to develop social skills to connect, communicate and partner with business. The ability of IT to connect and engage with business, and not just implementing a technical solution, is key to successful IT implementation.

➤ **Sub-Question 2.2: Findings**

Without business acumen, IT is not able to deliver fit-for purpose solutions to business. Technical skill alone do not provide for simplicity. Technical skills prohibit engagement at an emotional level. Technical skills ignore culture and emotional readiness of the recipients of related products and services. IT management is not seen as a critical business competency. Poor communication between business and IT leads to misalignment and mistrust and destroys value.

Technical competencies are insufficient for successful IT implementations. IT lacks business acumen to link the business goals and objectives to IT products and services. Without business acumen and social competencies IT is unable to connect with business (Dreiling & Recker, 2014). Therefore IT needs to develop these social competencies and skills to interact, communicate and partner with business (Cocks, 2014). Emotional competencies connect people from different backgrounds, experiences, abilities and competencies to create competitive advantage. The ability to understand and align the business requirements and strategic objectives with IT products and services requires practical intelligence, a key competency in acquiring and deploying fit-for-purpose business solutions.

Sub-Question 2.3: How do organisations recognise the value of, and give due recognition to IT resources? The *objective* of the sub-question is to determine what patterns emerge in terms of the EI of selected IT professionals, in order to identify which main clusters of EI competencies are needed for improved functioning in these roles.

➤ **Analysis: C-level Cluster**

Yes, organisations do acknowledge the value of IT in different formats. Formal recognition is not always signified out-loud; it often surfaces when there is degradation in service delivery.

IT needs to develop emotional competencies and skills to recognise their own value that they bring to the organisation.

The C-level cluster identified several factors that contribute to the perceptions that organisations do not recognise the value of IT: IT is seen as a support function and not as a strategic enabler of business; business does not view IT in the same way as they view their strategic vendors; and business does not acknowledge the strategic importance of IT as an enabler. As a result, they do not know how to access and apply IT strategically.

➤ **Analysis: CIO Cluster**

Some organisations do give recognition to IT. Recognition often surfaces when there is degradation in service delivery. Frederique Simonnet said “I wish they would. I believe that they are. They might not say it loudly and explicitly” (**Appendix N-3:8**). This is supported by Andrew Marks who said that “the short answer has to be NO. The medium answer is NOT ENOUGH” (**Appendix N-5:5**). However this is not the norm and differs from organisation to organisation. Because of the complex nature of IT, IT is often misplaced in the organisation and is still seen by some as an overhead. Galeboe Mmelesi stated that “where IT is given the role of enabling business value, the recognition is more prominent” (**Appendix N-6:5**). The result is that business does not fully utilise the enabling opportunities embedded within their business processes and their supporting technologies. Bheki Malinga stated that business “do[es] not realise the importance of IT” as an enabler of competitive advantage (**Appendix N-7:8**).

Organisations find it difficult to interact with IT because of the language that IT specialists use and their perceived lack of business acumen to engage with business. Sello Lehong stated that the “language that IT people use is strange” (**Appendix N-8:8**). In response, organisations are unwilling to put themselves into a position where they strive to understand the IT language. This is contradicting organisational behaviour since employees are forced to adopt the HR, finance and mainstream operations language of the company. Sello Lehong said that “contrasted to another environment within which a particular language has been adopted the rest of the organisation is forced to adapt to that language” (**Appendix N-8:8**).

➤ **Analysis: ESP Cluster**

Although IT is not always recognised within the business, the ESP cluster is of the view that CEOs are realising the importance of IT as a driving force in organisations globally. Richard Downing said that CEOs are “recognising the impact that technology have [sic] and are going to force them [business] to change ^(a)the way they are interfacing with their clients; or ^(b)their to-be [future] business” (**Appendix N-9:5**). The result is that more and more organisations

are beginning to acknowledge the emerging role and value of their IT resources in delivering on the organisational objectives. Richard Downing stated that CEOs are asking whether their IT “guys [are] up to speed or not? Are my guys impeding me?” (**Appendix N-9:5**).

However, the organisational perception of the value of IT is informed by their past experiences of IT’s ability to deliver on the business expectations, and often IT undersells its value to business. Dexter Roniger mentioned that IT often fails to “articulates [sic] the value they provide” to business (**Appendix N-12:6**). This is supported by Theo Hattingh who mentioned that IT “is seen as a ‘grouch purchase’ because of traditional experiences of organisations and the perception that IT seldom delivers on business expectations” (**Appendix N-11:4**). The recognition of the value of IT is often reflected in the positioning of IT within the organisational structure. Theo Hattingh said that “it depends on where IT sits on the priorities list within an organisation which would drive the recognition and reward behaviour” (**Appendix N-11:5**).

Ultimately the value of IT comes down to business and IT working together. Dexter Roniger stated that “it all boils down to communication and management style” (**Appendix N-12:6**). To improve their status, IT needs to fix its ability to communicate with business at a business level, allowing business to develop a better understanding of the complexity of IT and to recognise IT as an enabler of business. Sandra Solomon said that “where there is good collaboration, the value of IT is recognising in totality as a business enabler” (**Appendix N-10:7**).

➤ **Sub-Question 2.3: Findings**

IT lacks emotional competencies to acknowledge their own contribution to meeting the business objectives. IT fails to sell its value to business. Business does not acknowledge the strategic importance of IT. Business sees IT as a support function. Business finds it difficult to interact with IT.

Low levels of EI maturity in the IT department makes them feel insecure and that the business does not acknowledge their efforts, often impacting negatively on teamwork (Murphy & McMillan, 2013).

Organisations do acknowledge the value of IT in different formats. It is not always out-loud to signify formal recognition. Recognition often surfaces when there is degradation in service delivery. However, IT needs to develop the emotional competencies and skills to recognise the value they bring to the organisation. The lack of formal recognition could explain why organisations historically underutilised IT as an enabler of business.

The tide is changing with more organisations acknowledging the emergent role and value of IT as an enabler of the business strategy. However, because of the complex nature of IT, IT is still misplaced in the organisation. The result is that the business does not fully utilise the enabling opportunities embedded within their business processes and the IT assets.

Sub-Question 2.4: What are the most important IT management skills for non-IT executives /ESPs? The *objective* of the sub-question is to establish the management profile and attitudes for successful IT implementation.

➤ **Analysis: C-level Cluster**

The most important IT management skill for non-IT executives is the ability to communicate effectively (to listen and understand). Andrew Dippenaar said that “I need to be able as a non-IT executive to describe to IT what my challenges are and in doing so the non-IT executive need[s] to have a very clear vision where his or her function is going, what their strategy is, what their short-, medium-, long-term visions are, and to be able to communicate that to the IT management team” (**Appendix N-1:9**). They need to articulate the business requirements clearly to IT. Faizel Mulla said that if the non-IT executive is “clear and know[s] exactly what you [the non-executive] want to get as the end result or what the whole picture should look like, it does make it easier for IT actually to provide a solution” (**Appendix N-2:6**). The non-IT executives need to transform the IT department to a state where the IT persons understand the business objectives, and take the IT department to a point where the IT persons can communicate in a way that is seen to be cooperative and supportive to the business goals and objectives. Nazlee Rajmohamed said that the non-IT executive needs to “bring the IT person to a point where he can communicate in a way that is seen not to be uncooperative, to be supportive and to bring the IS person in his mental thinking to understand why business is pushing so hard, and to talk rather a language which everything is possible” (**Appendix N-3:8**).

In addition, non-IT executives need the ability to lead business and IT towards achieving common goals, knowing how to apply IT as an enabler of business, knowing what success looks like, treating business and IT as equals and with mutual respect, and managing and reducing business risks through the use of technology.

➤ **Analysis: CIO Cluster**

Non-IT executives need to understand the basic fundamentals of IT and how it can improve their business productivity. Sello Lehong said that the “ability to appreciate the value of IT” and to “see IT as a highly competitive function” are important skills for a non-IT executive (**Appendix N-8:9**). They need to clearly communicate their business requirements and

appreciate the value of IT as an enabler of competitive organisational advantage, as well as the ability to define and articulate success. Andrew Marks said that “the ability to describe your requirements in business terms clearly” to IT is the most important skill for non-IT executives (**Appendix N-5:6**). This is supported by Sello Lehong (**Appendix N-8:9**) and Galeboe Mmeseli (**Appendix N-6:5**).

➤ **Analysis: ESP Cluster**

Non-IT executives need the ability to understand and apply IT within their organisations to create value. Sandra Solomon said that non-IT executives need to “understand IT, within the context of the organisation and where there is collaboration one can add value to IT” (**Appendix N-10:7**). They need the ability to clearly articulate and communicate their business requirements to IT. When dealing with IT, business executives need to ensure that they establish a feedback loop to cross check that IT understands their requirements. Brian Desmond Harding said that “often the ‘why’ is what the IT guys do not know, and very often it is significant” (**Appendix N-14:6**). This is supported by Richard Downing who said that “non-IT business management need[s] to invest to ensure the business message is understood” (**Appendix N-9:6**).

In addition, non-IT executives need the ability to create, build, maintain and improve relationships. Theo Hattingh said that non-IT executives need “the ability to manage teams, the ability to manage relationships and partnerships and the ability to source and align the appropriate technology for business priorities” (**Appendix N-11:5**). They need to create and integrate IT and business teams to work together towards a common set of business objectives, while managing and mitigating business risks to control its impact on the organisation and its resources. Johannes Petrus Cronje said that “I have hardly ever seen a project get cancelled because the business case became irrelevant” (**Appendix N-13:9**).

➤ **Sub-Question 2.4: Findings**

Non-IT executives do not communicate their business requirements clearly to IT. Non-IT executives do not know what successful IT implementation looks like. Non-IT executives fail to teach IT business acumen. Non-IT executives fail to lead business and IT in a collaborative manner.

Non-IT executives are unable to communicate their business requirements to IT, resulting in the underutilisation of IT as an enabler of business (King III, 2009; Van Grembergen & De Haes, 2010; Brooks, 2011). Leading business and IT, non-IT executives are able to communicate effectively with IT (listen and understand). Clear and open communication between business and IT, where IT understands the business requirements and is able to

link business objectives with IT products and services, transforms the IT department from an enabler of business to a transformer of business.

iii) Stage II: Research Question 3: *How do organisations deal with the complexities of IT implementation?* The **objective** of the question is to determine and understand the value of alignment in successful IT implementations.

The following sub-questions were formulated and are directed towards answering Research Question 3.

Sub-Question 3.1: Why do organisations struggle to deal with the complexities of IT implementations? The *objective* of the sub-question is to determine what patterns emerge in terms of organisational change in IT implementation and the role of IT.

➤ **Analysis: C-Level Cluster**

Organisations struggle to deal with the complexities of IT implementation because of the rapid rate of change driven by macro socioeconomic forces, their inability to understand the complexities of organisational change management, and the lack of understanding the complexities of IT and how to use IT as an enabler to create competitive advantage. Nazlee Rajmohamed stated that “it is because IT implementations are so big in their impacts. IT impacts your life during implementation, it impacts what you do, it impacts how you do it” (**Appendix N-3:9**).

Organisations further struggle to control the constant change their organisation has to undergo. As a result, organisations do not allow themselves enough time to think about their requirements, consider their options in addressing their business requirements and requests, and implement the change, align their people, process and technology, and do not develop or deploy IT architectures that are forward looking, flexible and easy to adopt and adapt to changing business demands.

➤ **Analysis: CIO Cluster**

Organisations struggle to deal with the complexities of IT implementations because the IT department lacks business acumen and analytical, innovative and organisational change management competencies to drive successful IT implementation. Sal Laher stated that “IT people are their own worst enemy. IT people do not speak to the business in business terms” (**Appendix N-4:9**). There are many variables in IT implementations that IT and the project sponsor need to deal with for successful IT implementations. Sello Lehong said that “people

change management”, “technical complexity of the solution itself” and dealing “with the project team doing the IT implementation and the dynamics thereof”, are some complexities of IT implementation (**Appendix N-8:9**). Sello Lehong highlighted the need to “recognise that because of the specialised nature of the team doing the implementation, they have views and their perspectives on what they need to deliver on the project are quite different” (**Appendix N-8:9**). One, the IT leadership needs to be emotionally mature to deal with the people change management element, technical complexities, project team dynamics and rate-of-change. Andrew Marks stated that “IT implementation involves business change, which means involving people, human beings—changing in how they work, how they live and possibly how they are rewarded or recognised” (**Appendix N-5:6**). Two, business does not allow enough time or give proper notice to IT to deliver successful IT implementations and as a result violate the principles of the triple constraints of project management theory and traditional management theory. Three, organisational stakeholders ignore the complexities brought about by change such as the emotional state of employees affected by the change, stakeholder expectation, stakeholder mentality, and the dependency that exists between an IT project, business process and the organisational value chain. Galeboe Mmelesi said that the “business struggle[s] because they don’t give themselves the opportunities to understand IT” (**Appendix N-6:5**).

A lack of governance structures for decision making over IT implementation further contributes to the complexity of IT implementation. Changing business requirements often results in scope creep, which impacts IT’s ability to deliver IT products and services within the allocated budget, quality standards and timeframe. Poorly controlled changes to the business requirements often give rise to complexity of the IT products and services and increase the risk profile of the organisation.

➤ **Analysis: ESP Cluster**

Organisations do not spend enough time defining their business requirements, communicating their business requirements with all stakeholders, selecting and developing their business solutions, and managing the transition of business cultures and behaviours. Richard Downing said that “business need[s] to stand-up and own the solution” (**Appendix N-9:6**). As a result, business struggles to deal with the complexities of IT implementations. Theo Hattingh said that “they do not always understand necessarily the application of the technology to solve the business priorities” (**Appendix N-11:5**).

The lack of collaboration between IT and the business results in a poor understanding of the business strategy, drivers and objectives, which leads to complex and over-engineered business processes and solutions. Sandra Solomon stated that “the business objectives and

the outcomes may be unclear” and “there is not adequate planning, adequate collaboration” (**Appendix N-10:7**).

The choice of project resources further complicates the implementation of IT. Dexter Roniger stated that “often [the] wrong people are chosen for the project team” (**Appendix N-12:8**). Selecting the brightest people for the project could be destructive as organisations often forget that the pace is set by the weakest link. The operators of the IT products and services might not pose the same mental maturity as the developers. Solutions need to be engineered with simplicity in mind and not complexity. Dexter Roniger said that “we are trying to do too much on an implementation”, “too much functionality”, and “too much change for the organisation” (**Appendix N-12:8**).

Not giving enough attention to the organisational change management process and its effect on the business process, users and people, and their lives and attitudes, increases the complexities of IT implementation. Brian Desmond Harding stated that “the change management aspect is often completely ignored”, and that “they look at what the desired end state is of the system, they do not look at the desired end state is of the business” (**Appendix N-14:7**). The over simplification of IT often results in business ignoring the devastation it could cause to the business processes and the lives of its employees.

➤ **Sub-Question 3.1: Findings**

Organisations fail to respond timeously to the rapid rate of change driven by macro socioeconomic factors. Organisations fail to manage the impact of business change on processes, people (emotions, culture and behaviour) and technology. IT lacks business acumen to communicate the impact of change on business in a language that the business understands. Organisations lack governance structures for decision making. Business does not own IT implementations.

Organisations cannot deal with the rapid rate of change driven by macro socioeconomic demands. Changes are seen to be disruptive to business, thus increasing the business risks (Maurer & Lechner, 2014). Organisations fail to maintain skills and competencies to lead and direct them through change (Nelson, 2006; Madni & Jackson, 2009; Dreischmeier *et al.*, 2014).

Organisations do not spend enough time defining their business requirements, communicating their business requirements with all stakeholders, selecting and developing their IT business solutions, and managing the transition of business cultures and behaviours.

The lack of collaboration between IT and the business results in a poor understanding of the business strategy, drivers and objectives, leading to complex and over-engineered business processes and solutions.

Organisations ignore the complexities brought about by change such as the emotional state of employees affected by the change, stakeholder expectation, stakeholder mentality, and the dependency that exists between an IT project, business process and the organisational value chain.

Sub-Question 3.2: How do organisations implement complex IT strategies? The *objective* of the sub-question is to determine the relationship between IT and business.

➤ **Analysis: C-level Cluster**

Successful IT implementation is made possible through a clearly defined, simple and well understood strategy, business architectures that focus on future scenarios while servicing the organisation's present requirements, IT initiatives sponsored by and driven from business, and a structured change management programme to drive organisational change. Nazlee Rajmohamed stated that "business as the project owner", "cross-functional teams" integrating business and IT competencies, and "change management" are important variables for the successful implementation of an IT strategy (**Appendix N-3:10-11**). Faizel Mulla continued by saying that "an IT strategy is like a dialog" which requires the involvement of both business and IT (**Appendix N-2:7**). This is supported by Andrew Dippenaar who stated that "the IT strategy needs to be clearly understood" by both the business and IT (**Appendix N-1:11**).

➤ **Analysis: CIO Cluster**

Complex IT strategies should be implemented in an agile (piece-meal) approach to increase efficiency while reducing business risks as changes are introduced in smaller, more manageable components more frequently. Bheki Malinga said that "you must plan in such a way that there are little chunks of deliverables along the way" (**Appendix N-7:10**).

EA assists organisations in dealing with the complexity of IT implementation and bridges the expectation gaps between business and IT. Sello Lehong said that EA "bridge[s] the GAP that was seen to exist in as far as expectations were concerned between business and the IT" (**Appendix N-8:10**). However, Sello Lehong warned that "organisations employed the wrong people to take up the leadership role of the enterprise architecture function"

(**Appendix N-8:11**). EA combined with portfolio management and various other execution models such as agile, improves the chances of successful IT implementation.

Business capability models allow for the development of multi-year roadmaps, providing the business with a more accurate timeline of the delivery of new business functionality. Sello Lehong stated that business capability models “makes [sic] it easier for the IT organisation to tell and to sell to the organisation the time periods within which certain functionalities will be made available” (**Appendix N-8:11**).

Complex IT strategies can be simplified by standardising and aligning it with the corporate business plan. Sal Laher said that “you can actually implement what appears to be a complex IT strategy quite simply by making a decision that we will only use one universal language and that we will only use it this one way, that the regional variances will only be a handful and that is to be signed off by the Board or the EXCO – so you control it” (**Appendix N-4:10-11**).

➤ **Analysis: ESP Cluster**

Leveraging IT as an enabler of business requires organisations to review and change their business processes. Sandra Solomon stated that by leveraging “best practices ... coupled with full internal collaboration – you will be successful dealing with complexity” (**Appendix N-10:8**). The transition requires the organisation to act differently, which requires a change in the behaviour of its employees. The complexity involved in changing the organisational fundamentals will determine the measure of investment required in organisational change management. Richard Downing said that “they need to recognise they are fundamentally changing the business process” (**Appendix N-9:7**).

Strategic partnerships provide organisations access to industry knowledge, scarce skills and competencies, and the capacity to reach more locations at the same time. Strategic partnership performance is directly proportional to the effort put into the relationship.

Agreeing on the governance principles upfront to facilitate the transition and organisational change management process is helpful when implementing complex IT strategies. Dexter Roniger stated that “the executive (project sponsor) need[s] to lay down the law” (**Appendix N-12:9**). This requires an executive sponsor to ensure everyone in the organisation understands the goals and objectives of the project, and ensuring the involvement of everyone concerned with the project upfront. Supporting the implementation process is a clearly defined communication, change management and training strategy and plan. Dexter Roniger said that “both IT and business need to be involved” (**Appendix N-12:9**).

Driving complex IT strategies from the business ensures a clear understanding (alignment) among all stakeholders of the business problem, how to resolve it, and what success looks like. Dexter Roniger stated that the “involvement of every one that is concerned” is key to the implementation of complex IT strategies (**Appendix N-12:8**). By taking ownership of the project and its decisions, the project sponsor controls the business perceptions and behaviours while encouraging a culture of delivery and keeping to commitments. Theo Hatting stated that in his experience, successful “IT projects have typically been driven ... from a business point of view” (**Appendix N-11:6**).

Building a portfolio view (dashboard) of the organisation’s strategy and related IT and business projects defines and highlights the touch points, integration points and dependencies, and removing duplication assists the organisation with the implementation of complex strategies. Johannes Petrus Cronje said that management needs to ensure that all its “IT initiatives at this moment maps back directly to a strategic objective” (**Appendix N-13:11**), while Dexter Roniger added that “it is important that you make sure people stay to their commitments” (**Appendix N-11:9**).

➤ **Sub-Question 3.2: Findings**

Organisations do not have a clearly defined business strategy and EA. Business does not own the implementation of its IT strategies. IT implementations are complex, disruptive and increase business risks. Organisations employ the wrong people to lead their EA initiatives. IT strategies lack standardisation and are not aligned with the business strategy. Organisational change is not governed and managed properly.

IT strategies are complex, not well managed and not aligned with the business strategy (King III, 2009; Brooks, 2011).

The implementation of complex IT strategies is made possible by a clearly defined, simple and well understood strategy, business architectures that focus on future scenarios while servicing its present requirements of the organisation, sponsorships that are driven from business, and a structured change management programme to drive the business transition process.

Agreeing on the governance principles upfront facilitates the transition and organisational change management process when implementing complex IT strategies. An executive sponsor ensures that everyone in the organisation understands the goals and objectives of the project, and ensures their involvement. A clearly defined communication, change management and training strategy and plan supports the implementation process.

Building a portfolio view (dashboard) of the organisation's strategy and related business and IT projects highlights the touch points, integration points and dependencies, and removes duplication.

Complex IT strategies are broken down and implemented in an agile (piece-meal) manner to increase efficiency while reducing business risks as changes are introduced in smaller more manageable components more frequently.

Strategic partnerships give organisations access to industry knowledge, scarce skills and competencies, and the capacity to reach more locations at the same time when implementing complex IT strategies.

Sub-Question 3.3: What is the value of IT understanding the business drivers and speaking the language of business? The *objective* of the sub-question is to determine the patterns emerging in terms of business and IT alignment during successful IT implementations.

➤ **Analysis: C-level Cluster**

The ability to understand the business language establishes a mental model between business and IT that fosters a culture of collaboration, ownership, common purpose and vision, which leads to greater commitment, trust and the need to belong to something greater than the sum of the individual. Andrew Dippenaar stated that "it is extremely important that IT understand[s] the business drivers" because "as soon as a user community distrust an IT solution they will just not use it" (**Appendix N-1:11**). This is supported by Wayne Kaak who said that "understanding the business drivers assist[s] you when you listen to the requirements business have [sic] for new IT installations or requirements" (**Appendix N-3:11**).

➤ **Analysis: CIO Cluster**

Business acumen leads to better alignment between business and IT, builds trust, and delivers agile architectures that are forward looking. Sal Laher said that "you have to be talking business drivers, you have to be speaking the language of the business, you have to know your business processes, the pains, the corporate plan, the growth plan, the risks and you have to be talking to them on that level and how you are going to have them resolved that" (**Appendix N-4:11**). Business acumen further ensures that IT has a clear understanding of what the priorities of the organisation are, and is aligned in terms of the execution of the business priorities. Sello Lehong mentioned that the "IT environment will have a bigger and much more [sic] clearer appreciation of what the priorities of the organisation are" (**Appendix**

N-8:11). It provides a platform for business and IT to discuss how technologies can serve as an enabler of business. Alignment between business and IT provides for innovation to improve revenue, create a competitive advantage, and drive transformation. Andrew Marks stated that it has “got to be done in the language of the business and not in the language of IT” (**Appendix N-5:7**).

➤ **Analysis: ESP Cluster**

The value of IT understanding the business drivers and speaking the language of business enables business and IT to interact and to collaborate in implementing the business strategy and to leverage technology as an enabler. Sandra Solomon said that “they need to recognise they are fundamentally changing the business process” (**Appendix N-10:8**). Knowledge of the business allows for collective and proactive innovation to improve the organisational competitiveness, while allowing IT to be agile and more responsive to the changing business needs. Sandra Solomon said that “knowledge sharing through sharing” is a key driver for innovation between business and IT and within IT itself (**Appendix N-10:8**).

Good organisations make time to educate their IT department in their business processes. Understanding the business, its objectives, and what they are trying to achieve allows for the translation of the business requirements into IT solutions. Theo Hattingh said that “IT should not exist for the sake of the IT but for the sake of business” (**Appendix N-11:6**).

Successful organisations have a culture, mindset and attitude of collaboration, transparency and trust. Its employees are emotionally well developed and do not allow for egos. Dexter Roniger stated that “whether I like that person or not, he has some skills—that is why the company choose [sic] him. I need to work with that person, I have to put aside, and that is not easy, things like ego, dislikes, all those kinds of things” (**Appendix N-12:10**).

Language barriers result in the breakdown of relationships and trust, which contributes to the failure of IT implementation. Dexter Roniger said that “communication is mostly what is going wrong in anything; communication is the root cause of issues” (**Appendix N-12:10**).

➤ **Sub-Question 3.3: Findings**

The lack of business acumen on the part of IT negatively influences business ownership and collaboration between business and the IT department, and destroys trust. IT does not understand the business priorities. It fails business in innovating new services to create a competitive advantage for business. The business fails to educate IT in its business processes.

IT lacks business acumen to formulate, plan and implement an IT strategy to create a competitive business advantage (Chan, Fung & Chien, 2013; Bulley, Baku & Allan, 2014).

The ability to understand the language of business allows for the establishment of a mental connection between business and IT that fosters a culture of collaboration, ownership and common purpose, and sets a shared vision.

Business acumen leads to better alignment between IT and the business, which builds trust and delivers agile architectures that are forward looking.

The value of IT understanding the business drivers and speaking the language of business develops a clear understanding of what the priorities of the organisation are and aligns business and IT. It provides a platform for business and IT to agree on how technologies can serve as an enabler of business, driving transformation, creating a competitive advantage and improving revenue through innovation.

Organisations that fail to overcome their communication and language barriers will experience a breakdown in relationships and trust—not restricted to the business and IT relationship only. They will further experience increasing difficulty implementing their IT strategy.

4.4.2.3 Stage II: Conclusion

The research problem reads as follows:

The implementation of an effective and efficient IT department within a complex environment remains problematic for business and IT management as traditional management does not necessarily support the implementation of IT within organisations in the African Oil and Gas industry.

Three research questions, each consisting of a number of sub-questions, eleven in total, were asked to participants. The following section concludes the responses of each cluster (C-level, CIO and ESP).

(a) Management Theory

Management theory is evolutionary and should develop as the external world changes. Traditional management in the African context needs to be complimented with related management competencies to manage related business risks, manage and mitigate cultural dynamics, and overcome language barriers as well as the lack of infrastructure. These findings resonate well with those of Solomon (2014) who said that the traditional

management approaches of power, hierarchical structure and autocracy do not work anymore.

Organisations in the African Oil and Gas industry fail to leverage IT as an enabler of their business strategies. Downing (2014) stated that organisations choose the wrong key performance indicators to measure the contribution of IT towards the achievement of their strategic objectives and control organisational behaviour. In their seminal paper that introduced the concept of the Balanced Scorecard, Kaplan and Norton (1992) stated the need for executives to understand that traditional financial accounting measures like *return on investment* can give misleading signals for continuous improvement and innovation. While traditional financial performance measures worked well during the industrial era, they are out of step with the socioeconomic demands placed on organisations to compete in a complex and competitive industry such as the African Oil and Gas industry.

After much research, conducted over several decades, the battle between IT and the business is far from over. A lot will still be said and written about management styles, business and IT alignment, and EA. The results of this study show that most of the factors affecting the strenuous relationship relate to human factors and the management thereof.

As a mitigation, organisations often transfer the risk of IT management by outsourcing IT projects as a turn-key solution to external service providers without a clearly defined strategy, business plan and responsibility matrix.

(b) People

Over the past five decades business studies have not viewed IT management and governance as a critical and important business competency (King III, 2009; Van Grembergen & De Haes, 2010; Brooks, 2011). As such, it was never provided for in the curriculums. As a result, IT human resources in the African Oil and Gas industry lack the ability to resolve continental challenges through innovative alternatives and are dependent on multinationals for support. The backlog forces organisations to focus on building technical competencies and Practical Intelligence (PI) through experimental learning to resolve continental challenges such as the lack of IT infrastructure, competencies and skills. PI, developed by psychologist Robert Sternberg (2003a), suggests that the intelligence needed in a managerial function as well as in everyday functioning is different from the type of intelligence required in an academic setting. PI is the ability to capitalise on one's strengths and compensate for one's weaknesses in a business situation. From this definition, a person with applicable practical experience would be able to adapt to new environments and act appropriately within this changed environment. PI is thus an organisational asset. In a study of bank managers, Colonia-Willner (1998) examined PI and academic intelligence (IQ) to

determine which of the two was the better performance predictor. Overall, PI predicted managerial success, whereas IQ did not. Additionally, IQ significantly decreased with age, but PI did not. When the best performing older managers were examined, it was found that they had, on average, higher levels of PI (although they scored lower on the IQ measures). Similar studies were conducted by Sternberg (2003b) and Ugoani (2014), confirming the findings of Colonia-Willner.

Growth brings about change, and change has an emotional impact on humans. Controlling human behaviour requires leadership with high levels of EI. IT implementation involves business change, which involves people changing how they work, how they live and possibly how they are rewarded or recognised. Once changing any of these components, you are in a highly complex and a highly non-rational place (Marks, 2014). As an agent of change, the IT departments need to lead their organisations in developing a culture that is conducive to responding rapidly to a changing business environment.

Although business and IT are still divided whether or not the organisation recognises the value of IT in a changing environment, collaboration between the IT department and the organisation is critical to compete in a global economy. The lack of collaboration between business and IT is a key contributor to poor and incomplete user requirement specifications, which often leads to scope creep and implementation failures. IT needs to consult the business when an initiative no longer aligns with the corporate objectives, and *vice versa*. Controlling the behaviour of business necessitates IT to acquire higher levels of emotional maturity and structured governance.

Organisations struggle to deal with the complexities of IT implementation because they do not understand the technology and the application thereof to solve the business priorities. Hattingh (2014) argues that it is the responsibility of the IT department to translate technology in business terms in order for business leadership to understand the contribution that IT makes to the organisation goals and objectives in a business language understood by business.

Servicing as an enabler and transformational agent of business, the study highlights the need for the IT department to attract and maintain human resources with the right mix of business acumen, technical skills, practical experience and EI. Hattingh (2014) argues that “the makeup of the team should be a fine balance of technical skills, architecture skills and business understanding”. Business acumen informs and directs the EA, which informs technology selection and the skills and competencies needed by the technical teams responsible for IT implementation as well as the support thereof. The value of IT understanding the business drivers further ensures that the IT department delivers enabling

technologies to the business that will be current, relevant to the business goals and objectives, and keep the business competitive in a global economy (Downing, 2014).

(c) Agile

African companies are not recognising the value of IT at executive management and board levels. The King III Code and other gurus on good corporate governance are directing attention towards raising the value and importance of IT in a competitive and digitised economy (King III, 2009; Van Grembergen & De Haes, 2010; Brooks, 2011).

The application of technology as an enabler of business requires both foresight and insight, which serve as key drivers for EA as well as business and IT alignment.

EA has not yet reached the maturity of other traditional professional environments such as the construction industry to guarantee repeatable success (Vom Brocke & Rosemann, 2014; Kosasih, Goal & Polla, 2015). The appointment of the wrong people into the leadership of EA further reduces its potential for success (Lehong, 2014).

EA as a tool provides a sustainable platform for business growth and serves as protection against market vulnerabilities while predicting market trends for the improvisation of future customer demands (Kosasih, Goal & Polla, 2015). EA applied correctly transforms business uncertainty and doubt into certainty to allow business to predict the future with confidence, while innovation stimulates business efficiency. Innovation further provides for differentiation and is a core competency to create sustainable value and growth. "In this modern age, any core competency can actually be replaced in a matter of months; it is for that reason that the only core competency that is sustainable, is an organisation's ability to innovate constantly" (Lehong, 2014). The research further suggests that proper governance is applied over innovation to avoid the over-engineering of IT products and solutions. According to Roniger (2014), subject matter experts forget that the users of the IT solutions they engineered seldom have the capacity to master all the system functionalities, thus leading to a wasteful expenditure. It also leads to the failure of major IT implementations as some functionality might be dependent on data tables that are not populated or used by the user in production.

4.4.2.4 Stage II: Headline findings

Stage II: Research Question 1: *What are the complexities of IT implementations within organisations?*

- i) Traditional management does not allow for innovation, systems thinking and change management; it supports rigidity which does not allow for agility.

- ii) Because business and IT do not speak the same language, not enough time is spend to define and understand the business requirements as well as its impact on the business; i.e. processes, people and technology.
- iii) The fear for change caused by technological innovations and inventions instigates a breakdown in the IT and business relationship, leading to mistrust.
- iv) Organisational KPIs do not induce the right organisational behaviour in a changing business environment.
- v) Business and IT lack EI to drive business change.

Stage II: Research Question 2: *Why do IT professionals find it difficult to respond to the demands of business in a traditionally managed environment?*

- i) Because business does not understand the end-to-end business processes, they fail to clearly communicate their business requirements to the IT department, while the IT department lacks the business acumen to deliver fit-for-purpose solutions to the business.
- ii) Poor communication between the business and the IT department leads to misalignment and mistrust while it destroys value.
- iii) The IT department lacks emotional competencies and fails as an enabler and transformational agent of business.

Stage II: Research Question 3: *How do organisations deal with the complexities of IT implementation?*

- i) The business does not own the implementation of its business strategies; business lacks governance structures for decision making and fails to educate IT in its business processes.
- ii) IT lacks business acumen and EI to communicate the impact of change on the business in a language that the business understands while they fail to manage the impact of change on processes, people (emotions, culture and behaviour) and technology.
- iii) The IT department's lack of business acumen has a negative impact on business ownership of IT implementation as well as the level of collaboration between the business and the IT department during IT implementation.

To summarise, IT does not provide a strategic advantage for organisations in the African Oil and Gas industry as they lack business acumen (Chan, Fung & Chieng, 2013; Jiang & Carpenter, 2013; Bulley, Baku & Allan, 2014).

EA can assure IT implementation successes as in the case of the construction industry if organisations appoint people in the IT department with the right mix of IQ, PI and EI. Traditional management tends to focus on and be driven by the wrong *KPIs* and *does not* induce *the right* organisational *behaviour*. The Oil and Gas industry operates in a complex environment where technology is changing fast; organisations are struggling to move away from the traditional KPI measurement that does not induce the right behaviour where innovation and change are needed (Kaplan & Norton, 1992; Adams, 2014).

In addition, management theory is *evolutionary* and should develop as the external world changes. Traditional management styles need to be *complimented* with related management competencies such as business process management, portfolio management, project management, risk management and performance management. Organisations should develop a *culture* to respond to rapid change timely and to collaborate (Figure 4.4).

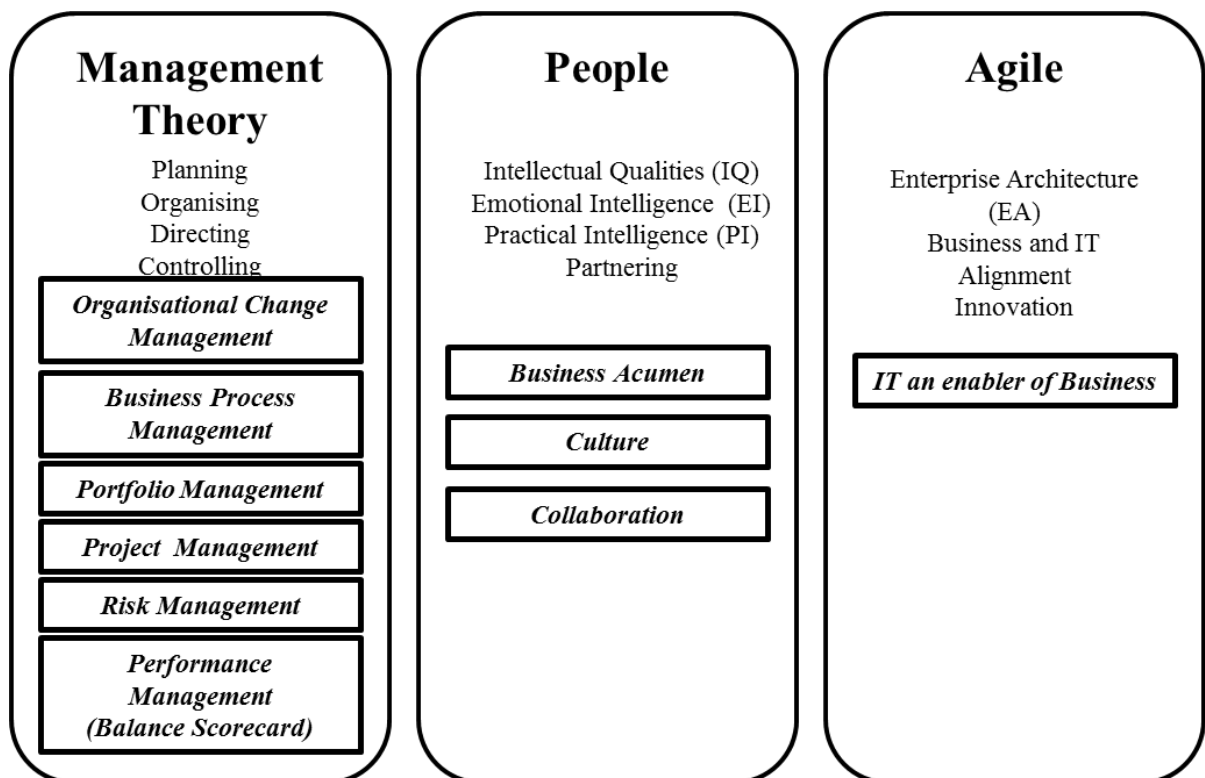


Figure 4.4: Evolution of managing IT

4.4.3 Stage III – Workshop: Force Field Analysis

The participants are of the opinion that if business continues to exclude IT from strategy formulation and make mergers and acquisition decisions without IT, and if IT continues to depend on its technical skills, competencies and knowledge to services the business, then IT will remain rigid.

4.4.3.1 Stage III: Description of sample

A workshop at the CIO Africa Summit, held at the Arabella Western Cape Hotel & Spa from 10 to 12 June 2014, was identified and selected to collect quantitative data using Lewin's (1951) Force Field Analysis (FFA) theory. Twenty-two (22) delegates of the CIO Africa Summit attended the workshop. The Workshop, entitled "*Information Technology in a Complex Economy: The African Oil and Gas Industry*", was facilitated by the researcher.

The workshop synopsis reads as follows: As an enabler of business, IT lacks the agility to respond to the ever changing and evolving requirements of business in a timely manner to deliver sustainable stakeholder value. IT in many cases has become a source of legacy rigidity, long lead-times and complexity rather than a platform for adaptability.

The goal of the workshop was to validate the findings from Stages I and II. The workshop aimed to explore the disconnect between traditional management and the way that IT implementation works as well as to understand how management theories can be applied to enable the IT departments to plan the future with confidence for predictable success. The following research questions were presented at the workshop:

- i) What are the complexities of IT implementations within organisations?
- ii) How do organisations deal with the complexities of IT implementation?
- iii) Why do IT professionals find it difficult to respond to the demands of business in a traditionally managed environment?

Table 4.9 provides a summary of the selected cases that participated in this stage of the study.

Table 4.9: Description of selected cases for Stage III

(Information provided by GDS International, CIO Summit 10th-12th June 2014, Arabella Western Cape Hotel & Spa, South Africa)

No.	Company	Full Name	Job Title	Consent
1	DHL	Amanda De Klerk	VP IT MEA	Workshop
2	Peregrine Holdings	Ariel Levien	CIO	Workshop
3	GE Transportation	Bhaskar Ramani	CIO – International	Workshop
4	Flight Centre	Craig Pestana	Group CIO	Workshop
5	Glomobile Ghana Limited	Ehis Uwagboe	Head, Information Systems	Workshop
6	GNPC	Ferdinand Aniwa	Manager, Information Systems, Data Management & Communication	Workshop
7	Hytec Holdings	Jay Sookdeo	Group IT Manager	Workshop
8	AfriSam	Louise van der Bank	Chief Information Officer	Workshop
9	Seven Up Bottling Co.	Nikhil Jhaveri	CIO	Workshop
10	PPECB	Nkosana Mbokane	General Manager: ICT	Workshop
11	Diamond Trading Company Botswana	Robert Boakgomo	IM Manager	Workshop
12	NMB Bank	Robson Tomu	Head of Information Technology	Workshop
13	Paarl Media	Rodger Matthee	CIO	Workshop
14	Afren Energy Services	Rufus Magbegor	IT Manager	Workshop
15	Kenya Power & Lighting Company	Samuel Ndirangu	Chief Manager IT & Telecommunications	Workshop
16	Transnet	Sibusiso Mabaso	CIO Property	Workshop
17	Botswana Postal Services	Thato Kewakae	CIO	Workshop
18	Rand Water	Thinus Bekker	General Manager – Information Technology & Knowledge Management	Workshop
19	Eskom	Thokozani Skaka	IT Projects Manager	Workshop
20	Media 24 News	Trent Clarke	CIO	Workshop
21	Technology Corporate Management	Tony Da Silva	Not known	Workshop
22	No name on feedback card	Not known	Not known	Workshop

4.4.3.2 Stage III: Analysis

The three research questions as published in section 4.2 were used as the foundation to formulate the three goals to be resolved by the workshop, one goal per question. A list was compiled of all artefacts that might affect achieving the goals. These were categorised into helpful and hindering artefacts. Each participant was asked to rank his or her top three (3) helping and hindering artefacts. The votes were counted manually and recorded on an

electronic spreadsheet. For the purpose of this research, the researcher focused on the top five (5) artefacts per category per goal only. The results are published in **Appendix L**.

i) **Stage III: Research Question 1:** *What are the complexities of IT implementations within organisations?*

Stage III: Goal 1: Discover (explore) the complexities of IT implementation.

➤ **Goal 1a: Helpful artefacts**

The workshop suggested that organisations take full advantage of the following most helpful artefacts, in order of magnitude: *business solutions innovator*; *enable decision making*; *value network enabler*; *business acumen*; and *forward thinking* (Table 4.10).

Table 4.10: Goal 1 rating of helpful artefacts

Rating	Helpful	Votes	%
3	Value network enabler	13	59.09%
	Cultural bridge builder	7	31.82%
1	Business solutions innovator	18	81.82%
	Control behaviours	0	0.00%
2	Enable decision making	16	72.73%
	Improve society	0	13.64%
	Organisational integrator	3	13.64%
	Break communication barriers	0	0.00%
4	Business acumen	9	40.91%
5	(agile) Forward thinking	8	36.36%
	Driver of change	5	22.73%
	Provide sustainable value	1	4.55%
Number of Attendees:		22	

➤ **Goal 1b: Hindering artefacts**

The workshop suggested that organisations avoid the following hindering artefacts, in order of magnitude: *disfunctional relationships*; *solutions are complicated*; *support for innovation (lack thereof)*, while participants rated *lack systems thinking* and *paradigms limit progress* evenly (Table 4.11).

Table 4.11: Goal 1 rating of hindering artefacts

Rating	Hindering	Votes	%
	Lack industry knowledge	0	0.00%
	Ego centric	0	0.00%
1	Dis-functional relationships	15	68.18%
	Change driven by policy	0	0.00%
2	Solutions are complicated	14	63.64%
	Unable to adapt	5	22.73%
	Management theory not established	1	4.55%
	Solutions do not provide for change	3	13.64%
4	Paradigms limit progress	6	27.27%
	Poor relationships lead to mistrust	0	0.00%
4	Lack systems thinking	6	27.27%
3	Support for innovation	13	59.09%
Number of Questionnaires		22	

➤ **Goal 1: Findings**

IT is not seen as part of the organisational value network and lacks business acumen to serve as an enabler and transformational agent of business. IT lacks EI to serve the business transformational requirements and to build sustainable business relationships.

To address the complexities of IT implementation, participants in the workshop suggested that collaboration and alignment between IT and the business is key to building trust and innovating new business solutions to address present and future business requirements, and that enterprise architecture (EA) enables the creation of tailored user experiences, thus enabling decision makers while allowing stakeholders across the enterprise to find more complete information faster and easier for better business outcomes. The participants argued that as an enabler of business, IT should be an integral part of the organisational value network. IT needs to develop the business acumen necessary to service the business and deploy flexible architectures that are agile and forward thinking.

The participants suggested that IT organisations avoid disfunctional relationships and poorly defined business requirement specifications that result in mistrust and long lead-times during product development in order to avoid IT solutions that are over-engineered, complex in nature and not considering the competency levels of the actual users on the shop floor. Participants further warned that IT organisations should not be run using outdated management theories which do not support innovation and progressive elaboration, and avoid legacy organisational and people paradigms that limit progression, forward thinking, and innovation within the organisation and IT implementation. The participants warned that

organisations that lack skills in systems thinking and action learning will not be able to respond to the rapid rate of change required to create a competitive advantage using IT.

ii) **Stage III: Research Question 2:** *How do organisations deal with the complexities of IT implementation?*

Stage III: Goal 2: Apprehend (understand) the artefacts that lead to successful IT implementation.

➤ **Goal 2a: Helpful artefacts**

The workshop suggested that organisations take full advantage of the following most helpful artefacts, in order of magnitude: *see the big picture*; *common goal*; *balanced employees*; *ability to define requirements*; while participants rated *deliver incremental value* and *sponsor removes barriers* equally (Table 4.12).

Table 4.12: Goal 2 rating of helpful artefacts

	Helpful	Votes	%
	Understanding each other's strengths	0	0.00%
	Post-implementation reviews	0	0.00%
3	Balanced employees	6	27.27%
2	Common goal	14	63.64%
	Enabler of competitive advantage	3	13.64%
4	Ability to define requirements	5	22.73%
	People skills	1	4.55%
5	Deliver incremental value	4	18.18%
	Listening skills	1	4.55%
	Cultural knowledge	3	13.64%
	Mixed models	1	4.55%
1	See the big picture	18	81.82%
5	Sponsor removes barriers	4	18.18%
	Number of Attendees:	22	

➤ **Goal 2b: Hindering artefacts**

The workshop suggested that organisations avoid the following hindering artefacts, in order of magnitude: *operational complexities*; *people capability*; *lack understanding*; while participants rated *lacks innovation* and *IT as a support function* evenly (Table 4.13).

Table 4.13: Goal 2 rating of hindering artefacts

	Hindering	Votes	%
	Provider of gadget	2	9.09%
	Inability to change	4	18.18%
	Execution rigidity	2	9.09%
	Generalisation of IT	1	4.55%
2	People capability	8	36.36%
4	IT is a support function	5	22.73%
	IT treat as vendor	0	0.00%
3	Lack understanding	7	31.82%
	KPI's driving behaviour	0	0.00%
	Time constraints	3	13.64%
1	Operational complexities	16	72.73%
	Corporate empires	1	4.55%
4	Lacks innovation	5	22.73%
	Number of Questionnaires	22	

➤ **Goal 2: Findings**

Organisations fail to own and leverage diversity to simplify IT implementation. Organisations fail to unite the business and the IT department to work together towards a common set of business goals. The IT department further lacks EI, PI and business acumen to manage business change.

Dealing with complex IT implementations, participants in the workshop suggested that EA is used to pre-empt future user demands while leveraging teamwork to unify different competencies from both business and IT to work towards a common goal. For this to happen, IT needs to employ balanced employees with the right levels of emotional intelligence, intellectual qualities and practical experience. IT needs to work with business to develop the ability within the business to identify and define their requirements while building IT into their business processes as an enabler of business. The participants suggested that IT projects be sliced into smaller chunks to deliver incremental and sustainable value more often with the flexibility to change whenever the business environment changes, and to leverage the business sponsor to remove implementation barriers and to put measures in place to track successes.

The participants suggested that IT organisations should avoid projects where the business underestimates the amount of effort and time required to automate their business processes. The IT department is cautioned not to accept deferring processes from business which come without a sponsor or owner who has the competency and capability to deliver on the demands of the process. When IT is viewed as a support function and not a strategic enabler

of business, business does not know the strategic importance of IT, and IT often does not have the knowledge of the business they are servicing. Such a relationship should be avoided at all costs as no amount of money will solicit a successful IT implementation. In addition, when IT lacks knowledge and experience of the business they are serving, they are unable to innovate and foster IT-business alignment.

iii) **Stage III: Research Question 3:** *Why do IT professionals find it difficult to respond to the demands of business in a traditionally managed environment?*

Stage III: Goal 3: Transforming the IT department from RIGIDITY to AGILITY.

➤ **Goal 3a: Helpful artefacts**

The workshop suggested that organisations take full advantage of the following most helpful artefacts, in order of magnitude: *business and IT are aligned; proactive business engagement; adapt to changing demands; interactive development; and holistic view of change* (Table 4.14).

Table 4.14: Goal 3 rating of helpful artefacts

	Helpful	Votes	%
	Turn problems into opportunities	0	0.00%
	Restricted number of service requestors	0	0.00%
4	Interactive development	5	22.73%
5	Holistic view of change	4	18.18%
	IT evolves with market trends	2	9.09%
	Business reach out to IT	2	9.09%
3	Adapt to changing demands	11	50.00%
	Control human behaviour	0	0.00%
	Self-correcting structures	0	0.00%
	Business sponsor	3	13.64%
	Managed teams	0	0.00%
1	Business and IT are aligned	16	72.73%
	Create value through team dynamics	1	4.55%
2	Proactive business engagement	15	68.18%
	Number of Attendees:	22	

➤ **Goal 3b: Hindering artefacts**

The workshop suggested that organisations avoid the following hindering artefacts, in order of magnitude: *IT excluded from strategy formulation; decisions made without IT; and lack business knowledge* (Table 4.15).

Table 4.15: Goal 3 rating of hindering artefacts

	Hindering	Votes	%
1	IT excluded from strategy formulation	16	72.73%
	Support function	0	0.00%
	People behaviour	1	4.55%
	Unclear user requirements	1	4.55%
	Business politics	2	9.09%
2	Decisions made without IT	14	63.64%
	Lack control over external factors	0	0.00%
	No feedback	0	0.00%
	Inability to manage change	2	9.09%
	Disruptive change interventions	0	0.00%
3	Lack business knowledge	4	18.18%
	Unable to integrate culture	0	0.00%
	Inability to deliver value	2	9.09%
	IT lacks innovation	1	4.55%
	Number of Questionnaires	22	

➤ **Goal 3: Findings**

The IT department lacks business acumen and the emotional competencies to align with business to serve as an enabler and transformational agent of business.

Transforming the IT department from rigidity to agility, participants in the workshop agreed that business and IT alignment is essential from EXCO level right down to the workroom and that IT engages with business leaders proactively on new ideas and system enhancements. IT architectures need to be forward looking, flexible and easy to adopt, and adapt according to changing business demands. Interactive development delivers small workable solutions more frequently with the ability to change with technology and business progression. In addition, IT needs to create a holistic view of the organisational change management requirements.

The participants warned that if business continues to exclude IT from strategy formulation and make mergers and acquisition decisions without IT, and if IT continues to depend on its technical skills, competencies and knowledge to service the business, then IT will remain rigid.

4.4.3.3 Stage III: Conclusion

An efficient and effective relationship between the business and IT remains key to the successful implementation of IT in a changing environment. IT needs to develop heterogeneous and dynamic IT management processes which provide for scalability, complexity, efficiency, manageability and robustness that promote IT agility while leading

shareholders effectively in the real world. To adapt to the changing business environment, IT needs high levels of emotional intellect and practical experience.

4.4.3.4 Stage III: *Headline findings*

The IT department lacks EI, business acumen and alignment with business to serve as an enabler and transformational agent of business.

4.4.4 Stage IV – Questionnaires

The survey confirmed that collaboration and alignment between business and the IT department is a key building block for trust, and that trust serves as a stimulus for innovating new business solutions to address present and future business requirements.

4.4.4.1 Stage IV: *Description of sample*

Quantitative data were collected through questionnaires based on the output of the FFA workshop conducted in Stage III. The sample size was selected from the Stage III Force Field Analysis workshop. Twenty two (22) workshop attendees plus three (3) alternative attendees to the CIO Summit, not attending the FFA workshop, were selected, twenty five (25) in total. Nine (9) attendees or 36% returned completed questionnaires.

Table 4.16 provides a summary of the selected cases that participated in this stage of the study.

Table 4.16: Description of participants to the Stage IV questionnaires

No.	Company	Full Name	Job Title	Consent
1	FSGLA	Davanathan Naidoo	CIO	Yes
2	Kenya Airways	James Buyekane	Head of Information Systems Operations Delivery	Completed, not signed
3	Hytec Holdings	Jay Sookdeo	Group IT Manager	Yes
4	AfriSam	Louise van der Bank	Chief Information Officer	Yes
5	Mansard Insurance Plc	Ndukwe Anagha	Divisional Director Operations & Technology	Yes
6	Transnet	Sibusiso Mabaso	CIO Property	Yes
7	Botswana Post	Thato Kewakae	CIO	Yes
8	Rand Water	Thinus Bekker	General Manager - Information Technology & Knowledge Management	Yes
9	Media 24 News	Trent Clarke	CIO	Yes

4.4.4.2 Stage IV: Analysis

The templates compiled and used in Stage III of the research Force Field Analysis workshop (section 4.4.3) were issued as individual questionnaires to see if a different pattern emerges from those detected during the workshop. Each participant was asked to rank his or her top three (3) helping and hindering artefacts. The responses of the participants were recorded. For the purpose of this research, the researcher focused on the top five (5) artefacts per category per goal only, as voted for by the participants. The results are published in **Appendix M**.

i) **Stage IV: Research Question 1:** *What are the complexities of IT implementations within organisations?*

Stage IV: Goal 1: Discover (explore) the complexities of IT implementation.

➤ Goal 1a: Helpful artefacts

The participants in the survey suggested that organisations take full advantage of the following most helpful artefacts, in order of magnitude: *business solutions innovator*, while participants rated *value network enabler*, *enabling decision making*, *business acumen* and *forward thinking evenly* (Table 4.17).

Table 4.17: Goal 1 rating of helpful artefacts

Rating <i>phase iii</i>	Rating <i>phase iv</i>	Helpful	Votes	%
3	2	Value network enabler	4	44.44%
		Cultural bridge builder		
1	1	Business solutions innovator	6	66.67%
		Control behaviours		
2	2	Enable decision making	4	44.44%
		Improve society		
		Organisational integrator	1	11.11%
		Break communication barriers	1	11.11%
4	2	Business acumen	4	44.44%
5	2	(agile) Forward thinking	4	44.44%
		Driver of change	2	22.22%
		Provide sustainable value	3	33.33%
Number of Attendees:			9	

NOTE: *phase equals stage*.

➤ **Goal 1b: Hindering artefacts**

The participants in the survey suggested that organisations avoid the following hindering artefacts, in order of magnitude: *disfunctional relationships*; *poor relationships lead to mistrust*; while participants rated *solutions are complicated*, *management theory not established* and *lack system thinking* evenly (Table 4.18).

Table 4.18: Goal 1 rating of hindering artefacts

Rating <i>phase iii</i>	Rating <i>phase iv</i>	Hindering	Votes	%
		Lack industry knowledge	2	22.22%
		Ego centric	1	11.11%
1	1	Dis-functional relationships	7	77.78%
		Change driven by policy	1	11.11%
2	3	Solutions are complicated	3	33.33%
		Unable to adapt	1	11.11%
	3	Management theory not established	3	33.33%
		Solutions do not provide for change	0	0.00%
4		Paradigms limit progress	1	11.11%
	2	Poor relationships lead to mistrust	4	44.44%
4	3	Lack systems thinking	3	33.33%
3		Support for innovation	2	22.22%
Number of Questionnaires			9	

NOTE: *phase equals stage*.

➤ **Goal 1: Findings**

The IT department is not part of the organisational value network. Poor alignment between the business and the IT department leads to misalignment and mistrust. Traditional management styles do not allow for agility and systems thinking.

To address the complexities of IT implementation, participants in the survey indicated that collaboration and alignment between IT and the business is key to building trust and innovating new business solutions to address present and future business requirements, and that EA enables the creation of tailored user experiences which enable decision makers and stakeholders across the enterprise to find more complete information faster and easier for better business outcomes. The participants argued that as an enabler of business, IT should be an integral part of the organisational value network. The participants further stated that IT needs to develop the necessary business acumen to service the business and to deploy flexible architectures which are agile and forward thinking.

The participants suggested that IT organisations avoid dysfunctional relationships and poorly defined business requirement specifications which result in mistrust and long lead-times during product development. They argued that poor relationships and mistrust often result in IT becoming an order taker and not an active business contributor. This leads to IT solutions that are over-engineered, complex in nature, and not considering the competency levels of the actual users on the shop floor. Participants further warned that IT organisations should not be run using outdated management theories which do not support innovation and progressive elaboration, and avoid legacy organisational and people paradigms that limit progression, forward thinking and innovation within the organisation and IT implementation. The participants warned that organisations lacking skills in systems thinking and action learning will not be able to respond to the rapid rate of change required to create a competitive advantage using IT.

ii) **Stage IV: Research Question 2:** *How do organisations deal with the complexities of IT implementation?*

Stage IV: Goal 2: Apprehend (understand) the artefacts that lead to successful IT implementation.

➤ **Goal 2a: Helpful artefacts**

The participants in the survey suggested that organisations take full advantage of the following most helpful artefacts, in order of magnitude: *common goal*; while participants rated *ability to define requirements* and *see the big picture* evenly (Table 4.19).

Table 4.19: Goal 2 rating of helpful artefacts

Rating <i>phase iii</i>	Rating <i>phase iv</i>	Helpful	Votes	%
		Understanding each other's strengths	0	0.00%
		Post-implementation reviews	0	0.00%
3		Balanced employees	0	0.00%
2	1	Common goal	9	100.00%
		Enabler of competitive advantage	1	11.11%
4	2	Ability to define requirements	5	55.56%
		People skills	2	22.22%
5		Deliver incremental value	2	22.22%
		Listening skills	1	11.11%
		Cultural knowledge	0	0.00%
		Mixed models	0	0.00%
1	2	See the big picture	5	55.56%
5		Sponsor removes barriers	2	22.22%
Number of Attendees:			9	

NOTE: *phase equals stage.*

➤ **Goal 2b: Hindering artefacts**

The participants in the survey suggested that organisations avoid the following hindering artefacts, in order of magnitude: *operational complexities*; *lack understanding*; while participants rated *inability to change*, *people capability* and *IT as a support function* evenly (Table 4.20).

Table 4.20: Goal 2 rating of hindering artefacts

Rating <i>phase iii</i>	Rating <i>phase iv</i>	Hindering	Votes	%
		Provider of gadget	1	11.11%
	3	Inability to change	3	33.33%
		Execution rigidity	2	22.22%
		Generalisation of IT	1	11.11%
2	3	People capability	3	33.33%
4	3	IT is a support function	3	33.33%
		IT treat as vendor	0	0.00%
3	2	Lack understanding	5	55.56%
		KPI's driving behaviour	1	11.11%
		Time constraints	0	0.00%
1	1	Operational complexities	6	66.67%
		Corporate empires	1	11.11%
4		Lacks innovation	1	11.11%
Number of Questionnaires			9	

NOTE: *phase* equals *stage*.

➤ **Goal 2: Findings**

Organisations fail to leverage cultural diversity to simplify IT implementation, while the business fails to take ownership of their IT implementation initiatives.

Dealing with complex IT implementations, participants in the survey suggested that EA is used to pre-empt future user demands, while leveraging teamwork to unify different competencies from both business and IT to work towards a common goal. For this to happen, IT needs to work with business to develop the competency within the business to identify and define their requirements while building IT into their business processes as an enabler of business.

The participants suggested that IT organisations should avoid projects where the business underestimates the amount of effort and time required to automate their business processes. The IT department is cautioned not to accept deferring processes from business which come without a sponsor or owner who has the competency and capability to deliver on the demands of the process. When IT is viewed as a support function and not a strategic enabler

of business, business does not know the strategic importance of IT, and IT often does not have the knowledge of the business they are servicing. Such a relationship should be avoided at all costs as no amount of money will solicit a successful IT implementation. In conclusion, participants argued that traditional and conventional IT management lack the agility and people skills to deal with rapid change in technology and business needs.

iii) **Stage IV: Research Question 3:** *Why do IT professionals find it difficult to respond to the demands of business in a traditionally managed environment?*

Stage IV: Goal 3: Transforming the IT department from RIGIDITY to AGILITY.

➤ **Goal 3a: Helpful artefacts**

The participants in the survey suggested that organisations take full advantage of the following most helpful artefacts, in order of magnitude: *business and IT are aligned; proactive business engagement*, while participants rated *holistic view of change, adapt to changing demands* and *business sponsor* evenly (Table 4.21).

Table 4.21: Goal 3 rating of helpful artefacts

Rating <i>phase iii</i>	Rating <i>phase iv</i>	Helpful	Votes	%
		Turn problems into opportunities	2	22.22%
		Restricted number of service requestors	0	0.00%
4		Interactive development	1	11.11%
5	3	Holistic view of change	3	33.33%
		IT evolves with market trends	1	11.11%
		Business reach out to IT	2	22.22%
3	3	Adapt to changing demands	3	33.33%
		Control human behaviour	0	0.00%
		Self-correcting structures	0	0.00%
	3	Business sponsor	3	33.33%
		Managed teams	0	0.00%
1	1	Business and IT are aligned	8	88.89%
		Create value through team dynamics	0	0.00%
2	2	Proactive business engagement	4	44.44%
Number of Attendees:			9	

➤ **Goal 3b: Hindering artefacts**

The participants in the survey suggested that organisations avoid the following hindering artefacts, in order of magnitude: participants rated *IT excluded from strategy formulation* and *decisions made without IT* evenly, and *unclear user requirements* and *lack business knowledge* evenly (Table 4.22).

Table 4.22: Goal 3 rating of hindering artefacts

Rating <i>phase iii</i>	Rating <i>phase iv</i>	Hindering	Votes	%
1	1	IT excluded from strategy formulation	7	77.78%
		Support function	0	0.00%
		People behaviour	1	11.11%
	2	Unclear user requirements	3	33.33%
		Business politics	1	11.11%
2	1	Decisions made without IT	7	77.78%
		Lack control over external factors	0	0.00%
		No feedback	0	0.00%
		Inability to manage change	2	22.22%
		Disruptive change interventions	1	11.11%
3	2	Lack business knowledge	3	33.33%
		Unable to integrate culture	0	0.00%
		Inability to deliver value	2	22.22%
		IT lacks innovation	0	0.00%
Number of Questionnaires			9	

➤ **Goal 3: Findings**

The IT department lacks business alignment and acumen to serve as an enabler and transformational agent of business.

Transforming the IT department from rigidity to agility, participants in the survey agreed that business and IT alignment is essential from the executive management level right down to the workroom, and that IT engages with business leaders proactively on new ideas and system enhancements. IT architectures need to be forward looking, flexible and easy to adopt, and adapt according to changing business demands while IT creates a holistic view of the organisational change management requirements. In addition, the appointment of a business sponsor will remove barriers and put measures in place to track and ensure successful IT implementation.

The participants warned that if business continues to exclude IT from strategy formulation, make mergers and acquisition decisions without IT, and lacks clearly defined user requirement specifications, and if IT continues to depend on its technical skills, competencies and knowledge to service the business, then IT will remain rigid.

4.4.4.3 Stage IV: Conclusion

Collaboration and alignment is key to building *trust* and *innovating* new business solutions to address present and future business requirements. Teamwork unifies different competencies working towards a common goal.

4.4.4.4 Stage IV: Headline findings

The findings are similar to the findings in Stage III.

4.5 FINDINGS

This section provides the reader with a synopsis of the findings of the study. Table 4.23 links the findings to the research question(s), research objective(s), theme(s) and the key focus areas(s). This is followed by the headline finding(s) for each of the research questions. The research revealed that: ⁽¹⁾management styles do not evolve with the changes induced by macro socioeconomic demands; ⁽²⁾organisations use KPIs that do not instil the preferred organisational behaviour and culture—these KPIs create resistance to change while limiting innovation and collaboration between the IT department and the business; ⁽³⁾the IT department lacks EI, business acumen and alignment with business to serve as an enabler and transformational agent of business; and ⁽⁴⁾teamwork unifies business and IT to work towards a common goal.

Table 4.23: Mapping of research findings to the problem statement and research questions

Research Question	Objective	Finding	Theme (Table 3.1)	Key Focus Area (Table 3.1)	Headline Finding	
Question 1: What are the complexities of IT implementations within organisations?	To determine and understand the driving forces and the variables between traditional management and other theories required for successful IT implementation.	Finding 1: Organisations do not have a culture for robust organisational change management that supports the successful implementation of IT projects by the IT department.	Management Theory	Planning; Organising; Directing; Controlling	Headline Finding 1: Management styles do not evolve with the changes induced by macro socioeconomic demands.	
		Finding 2: There is a lack of EI and practical experience in IT.	People	Emotional Intelligence; Practical Intelligence		Headline Finding 2: Organisations have wrong KPIs that do not instil the preferred organisational <i>behaviour and</i> culture, thus creating resistance to change as well as limiting innovation and collaboration between the IT department and the business.
		Finding 3: The IT department does not attract and retain employees with the right mix of intelligence and experience who are emotionally well developed and qualified in their trade.	People	Emotional Intelligence; Practical Intelligence		
		Finding 4: Traditional management styles ignore business process management, portfolio management, project management, risk management, performance management, change management, IT management, and EA and EI as core management competencies.	Management Theory	Planning; Organising; Directing; Controlling		

Research Question	Objective	Finding	Theme (Table 3.1)	Key Focus Area (Table 3.1)	Headline Finding
		<p>Finding 5: Traditional management does not allow for innovation, systems thinking and change management; it supports rigidity that does not allow for agility.</p>	Agility	Enterprise Architecture; Business and IT Alignment; Innovation	
		<p>Finding 6: Business and IT do not spend enough time to define and understand the business requirements and its impact on the business; i.e. processes, people and technology.</p>	Agility	Enterprise Architecture; Business and IT Alignment; Innovation	
		<p>Finding 7: The fear for change caused by technological innovations and inventions causes a breakdown in the IT and business relationship, leading to mistrust.</p>	People	Emotional Intelligence; Practical Intelligence	
		<p>Finding 8: Organisational KPIs do not induce the right organisational behaviour in a changing business environment.</p>	Management Theory People	Planning; Organising; Directing; Controlling; Practical Intelligence	

Research Question	Objective	Finding	Theme (Table 3.1)	Key Focus Area (Table 3.1)	Headline Finding
<p>Question 2: Why do IT professionals find it difficult to respond to the demands of business in a traditionally managed environment?</p>	<p>To determine and understand what competencies are needed by IT professionals to satisfy the organisational IT service delivery demands in a changing environment.</p>	<p>Finding 9: IT departments do not have EA leadership with the right mix of business acumen; i.e. IQ, PI and EI.</p>	People	Emotional Intelligence; Practical Intelligence	<p>Headline Finding 3: The IT department lacks EI, business acumen and alignment with business to serve as an enabler and transformational agent of business.</p>
		<p>Finding 10: There is a lack of an efficient and effective relationship between the business and the IT department.</p>	Agility	Business and IT Alignment	
		<p>Finding 11: No alignment, collaboration and innovation as well as low levels of trust between the business and the IT department produce IT solutions that fail to address present and future business requirements.</p>	Agility People	Business and IT Alignment EI	
		<p>Finding 12: Business fails to communicate their business requirements clearly to the IT department.</p>	People	Emotional Intelligence; Practical Intelligence; Partnering	
		<p>Finding 13: The IT department lacks the business acumen to deliver fit-for-purpose solutions to the business.</p>	People	Intellectual Qualities; Practical Intelligence	
		<p>Finding 14: The IT department lacks emotional competencies and fails as an enabler and transformational agent of business.</p>	People	Emotional Intelligence; Practical Intelligence	

Research Question	Objective	Finding	Theme (Table 3.1)	Key Focus Area (Table 3.1)	Headline Finding
Question 3: How do organisations deal with the complexities of IT implementation?	To determine what patterns emerge in terms of organisational change in IT implementation and the role of IT.	Finding 15: Organisations do not have a culture for robust organisational change management that supports the successful implementation of IT projects by the IT department.	People	Culture	Headline Finding 4: Where teamwork exists it unifies business and IT to work towards a common goal.
		Finding 16: Business and IT lack EI to drive business change.	People	Emotional Intelligence	
		Finding 17: Poor communication between the business and the IT department leads to misalignment and mistrust.	People	Emotional Intelligence	
		Finding 18: Business does not own the implementation of its business strategies and lacks governance structures for decision making.	People	Emotional Intelligence; Practical Intelligence	
		Finding 19: Business fails to educate IT in its business processes.	People	Emotional Intelligence; Practical Intelligence; Partnering	
		Finding 20: IT lacks business acumen and EI to communicate the impact of change on the business in a language that the business understands.	People	Emotional Intelligence; Practical Intelligence; Partnering	

Research Question	Objective	Finding	Theme (Table 3.1)	Key Focus Area (Table 3.1)	Headline Finding
		Finding 21: Business and IT fail to manage the impact of change on processes, people (emotions, culture and behaviour) and technology.	People	Emotional Intelligence; Practical Intelligence	

4.6 SUMMARY

This chapter reported on the data collection processes and analysis of the data. A multistage mixed-model design was used to collect data through surveys and interviews. The data were analysed sequentially, with qualitative data analysis as the primary data analysis procedure. Through the four stages, namely ⁽ⁱ⁾questionnaires (surveys), ⁽ⁱⁱ⁾interviews (semi-structured questionnaire), ⁽ⁱⁱⁱ⁾Force Field Analysis and ^(iv)second round questionnaires, the researcher developed an understanding of how management is applied to enable the IT department to service the needs of organisations in a complex economy such as the African Oil and Gas industry, and how to plan the future with confidence for predictable success.

The findings shows that there is a disconnect between traditional management and the way that IT implementation works. Traditional management (with emphasis on the classical and contemporary styles) is no longer sufficient to deal with the challenges faced by the IT industry in a fast changing world. Business acumen, innovation, business and IT alignment, organisational change management, and a lack of emotional competencies are some of the contributing forces that prohibit the in-house IT department to service the emerging needs of businesses in the African Oil and Gas industry. The analysis shows that traditional management in isolation is not sufficient to ensure successful IT implementation and raises the importance of people competencies, agility and the need for innovation.

Chapter Five presents the conclusions and recommendations of the study. The chapter concludes with the limitations of the study and recommendations for future research.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

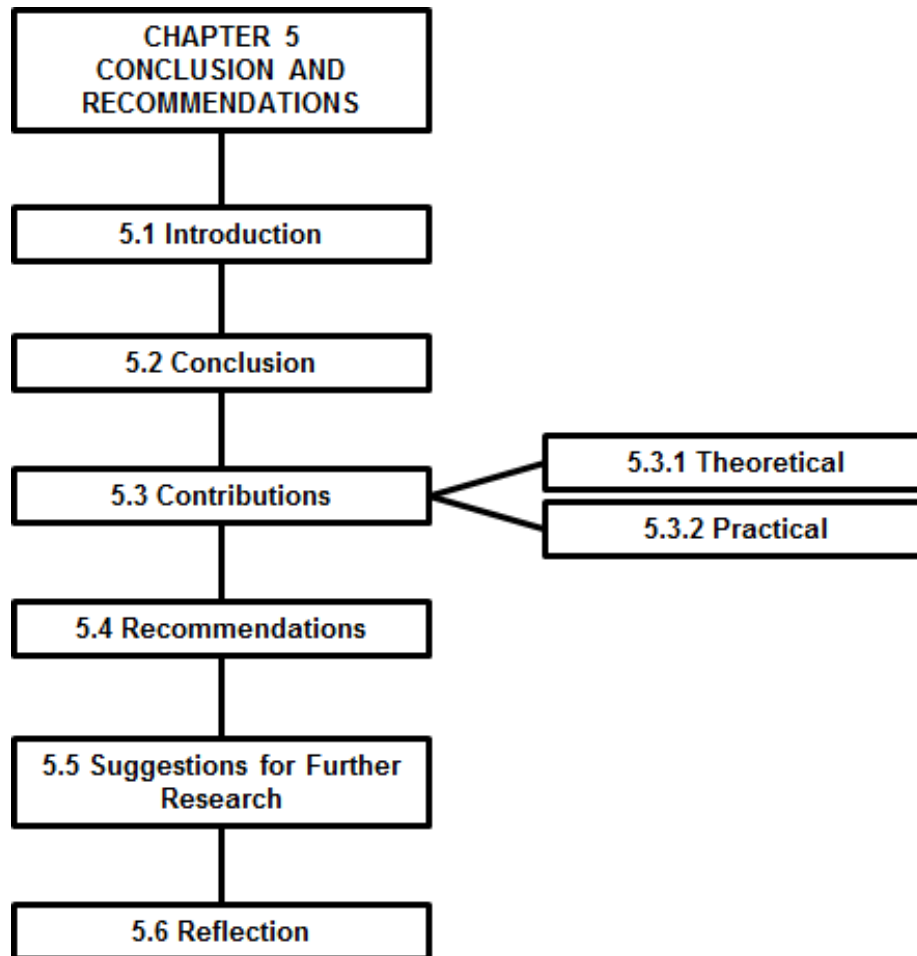


Figure 5.1: Chapter Orientation

5.1 INTRODUCTION

This chapter is divided into five (5) sections, namely conclusions, contributions, recommendations, suggested further research, and reflections.

5.2 CONCLUSION

The implementation of an effective and efficient IT department remains problematic for business and IT management as traditional management does not necessarily support the successful implementation of IT within the African Oil and Gas industry.

Much is written about *Business and IT Alignment* (Henderson & Venkatraman, 1993; Sauer & Yetton, 1997; Weil & Broadbent, 1998; Taylor-Cummings, 1998; Luftman & Brier, 1999; Reich & Benbasat, 2000; Smaczny, 2001; Luftman, 2003; Silviu, 2007) and EA (Zachman, 1987; Zachman, 1996a, 1996b; The Open Group, 2003; FEA, 2006a, 2006b, 2006c; Keltikangas, 2006; Sessions, 2007; Stenzel, 2007; Zachman, 2008; Lapalme, 2012). These practices are applied in different shapes and sizes, yet research provides sufficient evidence to confirm that organisations in the African Oil and Gas industry still struggle to ensure successful IT implementation.

Contributing to the complexities are the unethical behaviour and enrichment of a selected few, which raises the importance of organisations to behave responsibly with regard to social and environmental issues while creating economic wealth that serves the interests and needs of government, communities, citizens as well as those needs from their organisational stakeholders. This gives rise to the need to have information more readably available and accessible.

For the past five decades literature has suggested a movement in traditional management towards a humanistic approach, away from the bureaucratic command and control approach. Organisations recognise that their competencies lie in the skills and abilities of their staff to create a competitive advantage to outperform their rivals. Thus, to retain this competitive advantage, organisations need to retain the relationships and trust between the individual employees, and the employees and the organisation.

It is common cause that behaviour cannot be controlled by traditional organisational policies, procedures and standards. Trust is therefore based on shared values that influence human emotions which determine their behaviour. It is therefore important that organisations recruit employees who subscribe to the organisational values. Trust provides employees with security. Secure employees are more likely to express their creativity through innovation in a controlled environment to enhance organisational financial and non-financial performance.

From the research it became clear that IT is excluded from the business strategy and is still subjected to the command and control philosophy which is an artefact of the industrial revolution of the early 19th century. Organisations still believe that IT is an order taker, treated as an outsider to the organisation (a support function hidden within the organisational structures) and a cost center instead of being an enabler and transformational agent of business that holds a competitive advantage for the organisation and its management. To leverage the value that IT and its individual employees can bring to the organisation, the organisation needs to develop a relationship between all its stakeholders, including the IT department. Sustaining this relationship requires a different management philosophy and organisational culture.

It is evident from the research that traditional management in isolation is not sufficient to ensure successful IT implementation. Successful IT implementation requires a hybrid of management theories, approaches, styles and competencies (i.e. traditional management, business process management, portfolio management, project management, organisational change management, risk management, balance scorecard management, and others), people competencies (i.e. intellect, emotional intelligence, practical intelligence, partnering, business acumen, culture, teamwork and collaboration) and agility (i.e. EA, business and IT alignment, and innovation) to assist organisations to improve their success rate of IT implementation. Management theory is *evolutionary* and should be further developed as the external world changes.

The priorities of business and IT have changed and new capabilities emerged which are considered important compared to traditional planning, organising, directing and controlling, which have faded in importance. These new priorities focus on advancing the business processes to improve the agility and efficiency of business operations. Capabilities such as innovation (creative thinking, idea generation and EA) and people (intellectual qualities, emotional intelligence, practical intelligence and partnerships) are growing in importance (Figure 5.2). Innovation management is changing the role of IT in the organisation as an enabler of business to a transformer of business by removing and solving business problems through creative thinking. People management ensures that the organisation has the right mix of people onboard, providing them with an environment that supports personal growth to deliver futuristic and relevant business capabilities to secure the strategic positioning of the organisation within their industry.

The **conceptual framework** as proposed in Chapter Two, section 2.11, falls short when considering the finding that traditional management does not necessarily support the successful implementation of IT. The framework is developed from a point of view that IT acts as an enabler of business. The findings show that business, especially the way in which

business strategies change because of the volatility of the macro and micro environments within which the business operates, demands that IT departments become a transformational agent for business through innovation leadership.

The proposed framework is therefore amended to include innovation as an element of the IT lens and highlights the importance of people competencies such as EI and practical intelligence within the IS department to enable the IS department to serve as an enabler and transformational agent of business, adding cultural diversity to the people element of the IT lens.

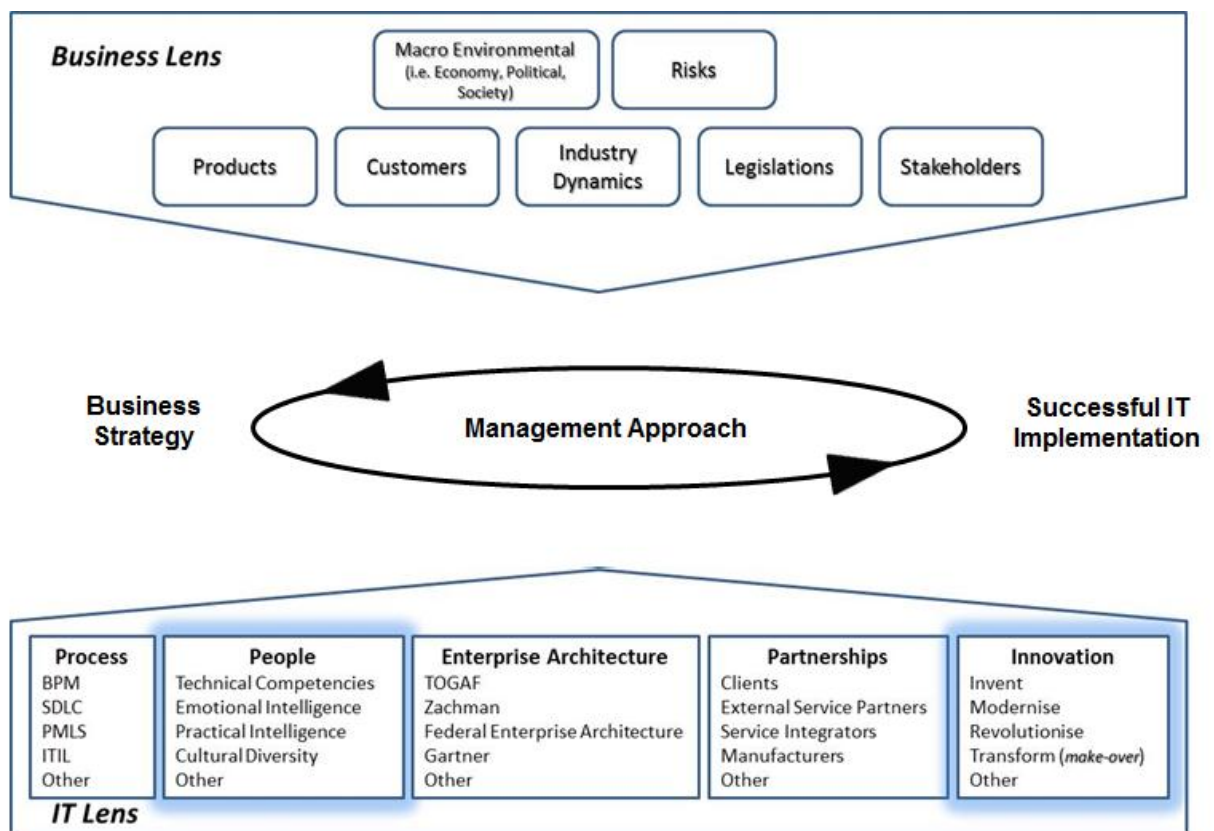


Figure 5.2: 'Adapted' conceptual framework (Refer to Figure 2:20)

IT leadership is becoming a critical transformational role in supporting the business in a changing world. Idea prioritisation and portfolio management is becoming a key capability for meeting the increasing demand for innovation and agility. In addition, risk management is rising in importance due to concerns among regulators regarding the resilience of IT delivery, especially those of critical importance to the sustainability of the business (King III, 2009).

To summarise:

- i) Traditional management fails to unite the business culture and the IT culture into a single business culture that services the needs of the organisation.
- ii) Traditional management lacks the ability to transform the organisation and its resources in a changing environment.
- iii) Traditional management does not recognise the importance of emotional intelligence as a key competency for organisational competitive advantage.
- iv) Traditional management does not recognise the importance of innovation and creativity as a competency for organisational sustainability.
- v) Management styles need to evolve with the changes induced by macro socioeconomic demands to remain relevant in a changing world.
- vi) As the transformational agent of business, IT needs to transform organisational thinking, culture and behaviour through collaboration and innovation.

The research started out by stating the research problem as:

The implementation of an effective and efficient IT department within a complex environment remains problematic for business and IT management as traditional management does not necessarily support the implementation of IT within organisations in the African Oil and Gas industry.

The purpose was to *explore* and *understand* the disconnect between traditional management and the way that IT implementation works within the African Oil and Gas industry. The research was further aimed at exploring and understanding the driving forces behind the successful implementation of IT in a complex environment. A framework has been proposed to direct the implementation of an efficient and effective IT department within organisations in the African Oil and Gas industry.

In order to find answers to the research problem and to achieve the purpose, three (3) main research questions were asked, namely:

- 1) What are the complexities of IT implementations within organisations?
- 2) Why do IT professionals find it difficult to respond to the demands of business in a traditionally managed environment?
- 3) How do organisations deal with the complexities of IT implementation?

In summary, IT implementation complexities (Research Question 1) are fuelled by disfunctional relationships and mistrust between business and IT. Traditional management lacks systems thinking, resulting in poorly defined business requirements. IT solutions are complicated and not considerate of its impact on the user.

The IT department finds it difficult to respond to the demands of business (Research Question 2) as it lacks business acumen to understand and interpret the requirements of business. A lack of interpersonal skills further complicates the formation of sustainable business relationships, both internal and external to the organisation.

Dealing with the complexities of IT implementation (Research Question 3), organisations in the African Oil and Gas industry require alignment between the business and the IT department across all levels of the organisation. Fostering proactive business engagements ensures that the right key performance indicators are set to meet the business demands in a changing and complex environment.

5.3 CONTRIBUTIONS

This section discusses the contributions made by the study and is divided into two sections, namely theoretical and practical contributions.

5.3.1 Theoretical contributions

The study contributes new knowledge with regard to the impact that management theory has on the successful implementation of IT in the African Oil and Gas industry. The research shows that capabilities such as innovation and people competencies are growing in importance while IT leadership is becoming a critical role in supporting and delivering on the business objectives, not just as an enabler of business but also as a transformational agent.

5.3.2 Practical contributions

5.3.2.1 Business driven innovation

As a multi-layered discipline, the IT department and its service providers often address components of the business value chain. Alas, many IT solutions lack user-friendly interfaces to assist the business in accessing the information required to run the business effectively. Knowing the business needs, IT can provide integrated solutions that support the complete business value chain without exposing the business to a rigid IT structure. Business driven IT innovation is a vehicle for business to meet new realities while remaining competitive.

5.3.2.2 Business acumen

Business requirements are sophisticated, while decisions are often informed and influenced by social networks. Business stakeholders demand that their needs be met in an agile manner where their requirements are adjusted as they learn and gain more insights into the business process during the development phase. To meet these demands, the IT department needs to develop a better understanding of the business needs—a gap that IT and business leaders are well aware of existing. This reinforces the need for IT to acquire business acumen of the industry they are servicing.

5.3.2.3 Data

Gathering data, structured and unstructured, enables IT to predict and offer relevant content and solutions to enable the organisation to reach their business objectives and goals. Not only will it improve the organisation's trust in IT, it will also ensure faster time to market while improving the organisational processes to maximise the return on investment. Innovative IT solutions offered to the organisation should be sensitive of the organisational culture and emotional impact on the business resources to maintain organisational trust.

5.3.2.4 Organisational culture

IT needs to be respectful to the organisational culture when deploying IT solutions. IT solutions should be deployed responsibly to ensure compliance with relevant and related laws, governance and security frameworks that inform the organisation's combined security framework.

5.3.2.5 Enterprise architecture

EA allows the business and the IT department to bridge the gap between rigidity and agility, providing enabling business solutions that can adjust rapidly to the changing demands of the organisation.

5.3.2.6 Transformational agent

As an enabler and transformer of business, technology can reveal opportunities to reach new markets, shed light on customer demands, and redirect business strategy in real-time based on data that the organisation did not even know existed. Technology can be a driving force behind tangible business outcomes, helping business to meet ever changing consumer demands.

5.3.2.7 Emotional intelligence

Responding to the macro socioeconomic demands, organisations need to bring together and align all its supporting functions, acting as one in order to be competitive and succeed in a changing world. Connecting with the organisation at an emotional level is still an uncharted art for both the IT department and the business—an art that IT needs to explore, develop and apply to efficiently and effectively reach out to the organisation in a language that the organisation understands. Cross functional teams, consisting of business and IT stakeholders which develop business enabled technology solutions, is a step closer towards organisational success and sustainability.

5.3.2.8 Corporate strategy

IT should be an integral part of the corporate strategy. If the corporate strategy fails to reference IT and the IT governance strategies, it implies that IT is still viewed as a separate entity outside of the organisation. The latter gives rise to the need for intervention to align business and IT. Alignment starts with taking the time to listen and ask the appropriate questions to obtain a clear understanding of the organisational needs and work together to establish measurable criteria for success.

5.3.2.9 Communication

As technology leaders, IT professionals are responsible to lead the business, clearly articulate their requirements, understand the business processes, and select solutions that best map their requirements and culture. This takes effort but the rewards are great. Communication throughout the process is necessary, even if the business does not fully understand the technology requirements. Getting business expertise into the IT department to serve as a soundboard to test the communications which are sent to the organisation helps decoding and communicating a clear message and assists with interpreting the responses that come back. Removing IT jargon helps business leaders to understand how technology can serve as an enabler of business.

5.4 RECOMMENDATIONS

5.4.1 Alignment

The role of the IT department is to assist their organisations in achieving their business objectives. For the IT department to align with the business, the IT department needs to acquire the business acumen ⁽¹⁾to talk with the business; ⁽²⁾work with the business; ⁽³⁾define problems and requirements with the business; ⁽⁴⁾outline processes with the business; ⁽⁵⁾outline solutions with the business; and ⁽⁶⁾exploit opportunities with the business. Alignment

is a dual responsibility where both the business and the IT department track the value of their efforts in accordance with the organisational strategy.

Involving the IT department during the initial phases of the organisational strategy formulation and subsequent reviews is a step in the right direction. This will allow the organisation to leverage the IT department as both an enabler and a transformational agent of the business. Promoting the IT department to participate in the business conversations and decision making will fast track the alignment process. With the right level of emotional competencies, business and the IT department can overcome the obstacles of the legacy bureaucratic structures of the past. Strengthening alignment between the business and the IT department requires time.

Of importance for organisations is to note that there is no one-size-fits-all business alignment model, and alignment is often influenced by the corporate culture. The emotional maturity of the organisation will determine the level of alignment between business and IT and the sustainability thereof, since there is no quick fix or technical answer for it. Effective alignment requires empathy, collaboration, leadership and innovation.

5.4.2 Communication

IT needs to develop the ability to respond to customers' needs in real-time. Real-time responses require that the IT department develops the necessary communication competencies to communicate with the business in a language that the business understands. To be a good communicator, the IT department needs to become a good listener. A good listener has the ability to repeat to the sender what he or she has heard and is able to translate the sender's (business) requirements into an executable plan of action.

To retain the organisational trust, the IT department needs to communicate authentically, educating, engaging and listening to the business. The timely execution of the business requirements by the IT department will assist the business to create and maintain a competitive advantage over their competitors. When the business feels emotionally stimulated and satisfied that the IT department is doing what they have asked from them, trust is formed and the relationship will strengthen.

Lucey, Bateman and Hines (2005) list the following reasons why organisational transformational efforts fail: the lack of a clear executional vision; lack of an effective communication strategy; failure to communicate a real sense of urgency; poor consultation with stakeholders; lack of structure, methodology and project management; failure to monitor and evaluate the outcome; failure to mobilise change champions; failure to engage

employees; absence of a fully dedicated and fully resourced implementation team; and the lack of sympathetic and supportive human resource policies.

Out of the ten reasons listed, seven are directly associated with the ability to communicate clearly and listen actively to both internal and external stakeholders. Hines, Found, Griffiths and Harrison (2008) support Lucey, Bateman and Hines's (2005) findings and added the need for leaders to nurture and develop staff to execute strategy while producing a positive organisational culture conducive to continuous and successful change.

5.4.3 Agility

Challenged to deliver sustainable shareholder value, organisations are in pursuit of the perfect IT business model. Organisations with highly complicated structures such as structured governance and reporting, long-term roadmaps and budgets, subsidiaries in geographically dispersed locations, multiple shared process owners, matured legacy third party IT applications, a variety of IT vendors and partners with on- and off-shore blended workforces, and an entrenched waterfall business decision framework through multiple integrated applications, find it difficult to adapt from rigidity to agility.

Fast, flexible and collaborative innovation is required to address the opportunities and threats of the digital economy. In a digital economy, IT agility is a necessity and non-negotiable. The right IT governance structure and vendor management strategy can assist the IT department to deliver on the organisational demands in an agile manner. Building a foundation of proven and complimentary practices for agility and applying different governance rules will improve levels of innovation and differentiation in running the IT assets to the benefit of the organisation.

5.4.4 Adaptive sourcing

Traditional sourcing works against innovation, whereas adaptive sourcing benefits stakeholders regardless of whether their business operating model is centralised, decentralised or federated. Adaptive IT sourcing improves organisational agility without the pressure to compete for scarce and critical skills and competencies or the need for significant capital investments. The implementation of adaptive IT sourcing improves IT implementation and operational successes, compliance, business process management, EA, and governance and risk management.

5.4.5 Innovation

Innovation captures customer insights, reduces organisational effort, increases productivity and promotes proactive organisational behaviour. Guided by the organisational values, IT innovation harnesses business-led technology experimentation to rapidly scale promising ideas regardless of their origin. Through constant business experience, learning and adaptive behaviour, an adaptive organisational culture can be formed to respond to the macro socioeconomic demands of a changing environment.

The fear of failure and becoming complacent prevent innovation and creativity within organisations, whereas innovation should be directed towards supporting the strategic agenda of the organisation while drive organisational growth, transformation and continuous improvement. Innovation resolves real-world business problems and challenges. It is at the centre of developing new products and services that drive the economy and markets. Traditional management associates innovation with luck. In a competitive world of fast moving (changing) needs and technologies, this no longer holds any truth. Innovation has evolved as a science and art, shaping the face of modern-day industries and economies. To be of value, innovation needs to promote risk taking (i.e. learn from past mistakes and make new mistakes but never repeat the same mistake twice) and provide employees with a reason of belonging to the organisation to drive creativity. According to Daniel Vasella (2002):

“...people do a better job when they believe in what they do and in how the company behaves, when they see their work does more than enrich shareholders”.

Innovation is not easy to deliver on improving existing products, cost reduction, implementing efficiency or creating new products and services. The process of innovation is driven through a series of interventions to prioritise the high number of ideas received during the input phase to just a few making it through to be successfully implemented. Establishing the funnel, which is representative of the corporate culture and risk appetite, selecting the correct ideas that meet the organisational vision, mission and strategy, is most challenging. It has to ensure the delivery of sustainable stakeholder value while meeting the socioeconomic and environmental demands faced by the organisation.

Innovation arose from ideas, a lot of ideas. It requires effort to transform ideas, sometimes combining ideas, to create innovative products or services worth applying to an existing problem or selling as a game changer. As a key focus area and enabler of corporate strategy, innovation itself needs to start during the corporate strategy process to ensure alignment with the corporate direction. As with most methodologies there is no one-size-fits-all approach to innovation and is largely influenced by the organisational culture.

The process of innovation includes thinking, portfolio management, and a standard of measurement, research, insight, development, marketing and selling:

- i) Thinking is the process of creating an advantage or a 'value add' for your company, shareholders or clients.
- ii) Portfolio management defines and categorises the object of improvement and how success will be measured.
- iii) Research confirms the GAPs identified in the existing market segment or business process and how best to resolve them. It identifies the options available to address the unknown.
- iv) Insight explores new ways to address future possibilities, creating sustainable customer and shareholder value. Insight is the result of examination and development through dedicated resources; result is the formulation of an innovation strategy and plan.
- v) Development is the process of designing, prototyping and testing new products and services.
- vi) Marketing is the process of branding and market development to grow sales.
- vii) Selling enables financial return on investment.

Managing the process of innovation is challenging for most organisations. The motivation for continuous innovation is growth in profits, markets and clientele. Innovative organisations subscribe to the principles of continuous improvement and organisational change management, giving sufficient time for the planning, execution and review of improvement and transformational activities.

Encouraging staff to experiment will further foster innovation. Once the word gets around that IT and its partners are innovative, it will attract more talented individuals, including business, to experiment and contribute towards corporate productivity. However, excessive IT complexity as well as poor management and implementation limit innovation. An IT Steering Committee which prioritises and aligns IT innovation projects with the corporate strategy and monitors the return on investment (as defined in the business case) will ensure that IT maintains an optimal IT portfolio. To maximise the IT portfolio returns, a governance and audit system should be created to evaluate usage following implementation. Governance often introduces red tape and although this is both critical and necessary, it should not render innovation to a state of redundancy or impossibility.

Lastly, employees are an organisations most precious asset. Nayar (2010) has a simple approach: “*Employees First, Customer Second*”. Nayar believes that if you hire the best and provide them the tools and feedback, supported by a 365 degree program where employees evaluate each other and their managers, it will boost personnel moral and innovation while it reduces personnel turnover.

5.4.6 Organisational change management

Organisational transformation is essentially about business and not technology, but business and technology need to work together. Whoever is leading the transformation should be determined by the nature of the transformation which the organisation is undergoing. IT should be considered alongside all of their C-level colleagues to find the most appropriate leader. If technology serves as an enabler of business to address growing market needs, it is the responsibility of IT to engage with the business leaders to make them aware of the possibilities.

It is healthy to fear change as it raises management’s attention to governance and risk management. In an environment of accelerated opportunities such as the African Oil and Gas industry, decisions need to be fast and governance light. This calls for agility and the promotion of rapid transformation throughout the organisation.

The lack of a sustainable change management capability hinders organisations to respond to changing consumer demands, operating models, processes, globalisation, and new regulations and technology, resulting in lost market shares while being overtaken by competitors. Where organisational change management programmes do exist, they are often disorganised and do not consider the holistic change landscape. As a result, employees are faced daily with an overflow of changed management campaigns.

Organisations need to build the capacity to lead change: ⁽¹⁾executive sponsorship for organisational change initiatives; ⁽²⁾project managers to manage the change; ⁽³⁾change practitioners to plan and implement the change; ⁽⁴⁾line managers to guide people along a change journey; and ⁽⁵⁾individuals to adapt to and grow through change (Deloitte & Touche, 2014). Organisational change management requires a single view of changes across the organisation, driven through a structured governance framework and supported by clearly defined roles and responsibilities.

5.4.7 Emotional intelligence

Engagement comes from emotions rather than logic. Employees’ emotions are effected by both the work they are doing and the people they are working with. Organisational goals

alone do not secure employee commitment, teamwork or engagement. When an organisational goal includes an emotional component, employees will not only commit to its success, but will connect with the organisation and its vision, while increasing productivity.

In his book, *“Leaders’ playbook”*, Nadler (2006:59) says that:

“...the number one reason employees leave their jobs is because they do not feel appreciated at work, predominately by their bosses”.

The Saratoga Institute reports that 50% of work-life satisfaction is determined by the relationships that workers have with their bosses. In a survey of 4 million workers, the Gallop Poll found that 65% of Americans received no recognition for good work in the last year. The poll also found that 55% of employees are disengaged (i.e. are just putting in the time) and that 19% of workers are actively disengaged. This totals to approximately 22 million workers who are ⁽¹⁾less productive, ⁽²⁾more stressed-out, ⁽³⁾missing more work days, and ⁽⁴⁾less satisfied with their personal lives. The cost of the United States is about \$370 billion annually in economic performance. This is an underestimation because it does not take into account absences, illnesses and other problems that result from disengagement and bad leadership. In their book, *“Winning”*, Welch and Welch (2005) state that “leaders establish trust with candour, transparency, and credit”. Trust is an important emotional component for employee engagement.

People do not change for the sake of changing, therefore for success, leaders must connect with all shareholders both inside and outside the organisation to show them and help them understand how they and the organisation will benefit from the proposed change. This view is shared by Welch and Welch (2005) and Covey (2009). Talking about the outcome helps employees to understand how their role and contribution will lead to success.

However, recognition is not the only driver for success and performance. To some employees it is the fulfilment they experience when achieving something of importance or making a difference in somebody’s life. Truman (2014) indicates that “it is amazing what you can accomplish if you do not care who gets the credit”.

IT leaders should help their employees find their passion. Passion will help employee engagement. Engaged employees will lead to success and increase personal and organisational productivity and commitment. When people feel passionate about their work and their goals, they feel compelled to work with others towards a common vision.

Leadership across the organisation should develop the competencies to give praise in public and criticise in private; this will bring out the best of employees and strategic partners. There

is no one-size-fits-all management style. Good management is an art. Being called a leader is very different from being a leader. Leading by example works wonders and can mature the organisation, ensuring that those following achieve a maturity level and work ethics that supports the organisational culture.

Leaders as communicators are responsible for clarity and for targeting the content and the emotional tone to the audience. The ability to move seamlessly among diverse groups is a gift that can be cultivated. When communicating, consider breaking up the end-state into several intermediate milestones and give out small rewards for crossing each milestone.

Setting clear objectives and a vision which is understood by all is a step in creating a platform for collaboration. Rewarding milestones when they are reached plays a key role in engaging staff. Building a belief and value system will further facilitate employee involvement and participation out of their own free will. Realising that emotions play a key role in motivating employees, leaders can use it to link the employee, the job, the people they work with, and their bosses. Since motivation is related to human behaviour, understanding an employee's behaviour and attitude before assigning them to an initiative is critical to promote employee motivation in order to achieve positive results.

5.4.8 Staffing

The evolution and rate of change in technology necessitate that organisations (irrespective of the operating models) keep their technical skills and competencies relevant. Management has the responsibility to develop their teams accordingly. Changes in technology drive the need to manage the changing effect it has on the working environment to enhance productivity. The ability to respond rapidly to the macro socioeconomic requirements is of strategic importance to organisations, which could provide for competitive advantage.

IT professionals need to learn how to discover their own emotions while identifying those of their colleagues and business partners, leveraging EI to manage these emotions to success in meeting corporate goals in a manner that best fits the organisational culture, learning style and working method. Practicing adaptability as a form of self-management will allow for a rapid response to the changing macro socioeconomic environment—avoiding emotions to become a performance obstacle. Self-management enables IT professionals to choose the behaviours that will drive their own and team goals.

To add value to the organisation the IT department must be part of the organisation, understand the organisation and help set the organisational strategy while innovating new and compelling business products and processes. Developing these products and processes requires that the IT department understands the socioeconomical dynamics impacting the

organisational performance as well as how technology can serve as an enabler to increase profits and market penetration and reduce business risks while increasing organisational efficiency.

The IT department should develop the skills and competencies to collaborate with their business peers while challenging and influencing the business requirements to drive innovation, efficiency and effectiveness rather than being an order taker only (an example of a company that mastered this skill is Apple).

Too often IT recruits new talent only when executing the organisational strategy and not during the strategy formulation process, resulting in rushed decisions from a smaller candidate pool. There is an amazing amount of talent on the African continent waiting to be unlocked. The challenge is getting them to see the organisation's vision and align their values with the organisational values and ethics. Understanding the impact that slow decision making has on brand and image, employers continue to misjudge the time it takes to attract and appoint the right talent to launch new products, take on new projects or cope with the growing macro socioeconomic and environmental demands faced by their organisations.

To avoid the impact that talent acquisition has on the IT department's ability to serve as an enabler of business, IT needs to develop a dynamic talent management strategy. The talent management strategy should be informed by the IT department's organisational goals, objectives and timelines. It is useful to have an overview of the market to ensure that the strategy is in sync with reality.

Involving key decision makers during the negotiations process is good practice so as to not lose the right candidate to indecisiveness. The talent strategy should provide for the development of junior talent. Leveraging subject matter experts as mentors and coaches, junior personnel can be mentored and prepared to fulfil future requirements faster.

5.4.9 Enterprise architecture

When things are going bad, executives want to spend more money on business quality assurance and when things are going great, they question why they are spending money on quality assurance at all. From an IT perspective quality has to be built into the design of all IT products and services. Quality design starts with building quality assurance into the organisational strategy and business processes. When business processes are integrated and viewed holistically, they provide quality business products and services which in turn provide greater customer value. Value leads to customer and stakeholder satisfaction, the cornerstone of a sustainable enterprise.

EA enables the creation of tailored user experiences that enable decision makers and stakeholders across the organisation to find more complete information faster and easier for better business outcomes. It designs and develops enterprise-wide products and services based on the needs of the organisation and its customers. Business processes set the foundation for organisations to animate and accomplish the intentions of their strategy and goals. EA facilitates the provisioning of quality IT products and services as well as customer satisfaction which improves IT reputation and lowers the enterprise's total cost of IT ownership. In addition, to achieve successful IT implementation, organisations need to find the optimum balance between shareholder value and IT spent.

Successful IT implementation requires an upfront investment in EA, i.e. process (re)engineering, good design, quality assurance, security, information management, high availability and disaster recovery of related IT products and services, and good people (i.e. qualified, high emotional intellect and experienced). IT implementation and IT portfolio management give the IT department the opportunity to engage business at an equal level (as peers) to demonstrate the enabling power of technology from a business perspective.

The lack of commitment continues to hinder business transformation, largely due to the lack of a culture for change and continuous process improvement—factors commonly associated with an aging workforce (Cave, 2014).

5.5 SUGGESTIONS FOR FURTHER RESEARCH

Little research has been conducted on the subject of cultural diversity and its impact on successful IT implementation in the African Oil and Gas industry. When cultures are our own, they often go unnoticed until we try to implement a new strategy or programme which is incompatible with the receiver's central norms and values, and then we observe first-hand the power of culture (Kotter & Heskett, 1992). The researcher hopes to make IT leadership more aware to the influence and impact of multiculturalism on the successful implementation of an IT strategy in the African Oil and Gas industry. To address this gap, the researcher recommends the following research:

- i) What is the role of emotional intelligence in creating a corporate *culture* where business and IT collaborate as equals towards a common goal?
- ii) How to define IT *key performance indicators* that drive the right corporate behaviour.
- iii) How does IT show the value that they are adding to EXCO and the Board of Directors?

5.6 REFLECTION

IT implementation in the context of this thesis is not limited to the deployment of new information and communications technology products and services. IT Implementation in the context of this thesis is inclusive of Business Process Engineering, IT Solutions Engineering, development, implementation, maintenance and support, and IT portfolio management as required by African Oil and Gas companies to run, sustain and grow their businesses.

Seventeen (17) companies participated in Stages I and II of this study, representing the IT population in the African Oil and Gas industry. The IT population in Stages I and II was represented by three clusters, namely the CIOs and IT Directors, C-level executives and general managers, and external service providers (ESPs) delivering IT services and products through an internal customer IT department while 25 companies participated in Stages III and IV, representing CIOs and IT Directors from various sectors across the Africa continent. A larger population would have been preferred during Stages I and II of the research to *explore and understand* the disconnect between traditional management and the way that IT implementation works within the African Oil and Gas industry. The multistage sampling approach allowed the researcher through multiple interventions with the available social actors to collect enough data to produce a representative sample of the population under observation (Cameron & Price, 2009).

As an active member of the African Oil and Gas industry the researcher experienced that the seen cannot be separated from the unseen. The seen is where the researcher is associated with his employer and its related business activities. The unseen is where the researcher is seen as independent from his employer, making a theoretical and practical contribution to the industry. Peers in the African Oil and Gas industry were intimidated by the association between the researcher and his employer. This resulted in some role players in the targeted population deciding not to participate in the research study. In academic research projects where the researcher is an active member of the population under investigation the researcher should be represented by the tertiary institution sponsoring the research and awarding the tertiary qualification.

While conducting the research, the researcher made the following observations: When conducting research on the Africa continent it is important to build a relationship with the participants. Securing participation requires regular follow-up's with the participants—verbally and via email. Participants prefer face-to-face discussions rather than telephone or email contact. Participants are more likely to participate in a survey or questionnaire if they trust the person they are dealing with. In some instances hardcopies of the questionnaires were printed and placed on the participants' desks with arrangements made to collect the

questionnaires afterwards. Participants seldom honour the researcher's deadlines as critical and they infrequently comply. When possible, avoid conducting a research project during public and school holidays—remember it differs from country to country.

In closure, business and IT management agree that the role of IT has changed and is increasing in importance in a changing world. While the implementation of an effective and efficient IT department remains problematic, heterogeneous and dynamic management approaches enable management to respond to the macro socioeconomic and environmental factors facing their organisation, industry, regions and countries. When choosing a management approach, the approach should be considerate of culture and values. Business acumen, business-IT alignment, emotional intelligence, organisational change management and innovation are some management variables that provide for and promote IT scalability, efficiency, manageability, robustness and agility in a complex economy. Heterogeneous and dynamic management processes assist the IT department in their role as business enabler and transformational agent, leading shareholders effectively in the real world.

-The End-

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APPENDICES

Appendix A: Introductory letter for the collection of research data



Introductory letter for the collection of research data

Mr Colin Prince is registered for the D Tech (IT) degree at CPUT (211299677). The thesis is titled **INFORMATION TECHNOLOGY IN A COMPLEXED ECONOMY: THE AFRICAN OIL AND GAS INDUSTRY**. The aim of the research is to *explore and understand the disconnect between traditional management theory and the way that IT implementation work*. The supervisors for this research are: Dr Andre de la Harpe and Prof Johannes Cronje.

In order to meet the requirements of the university's Higher Degrees Committee (HDC) the student must get consent to collect data from organisations which they have identified as potential sources of data. In this case the student will use the analysis of the data collected through case studies, questionnaires and focus group interviews.

If you agree to participate in this research project, you are requested to complete the attached form (see the attached electronic version), to be printed on your organisation's letterhead.

For further clarification on this matter please contact either the supervisor(s) identified above, or the Faculty Research Ethics Committee secretary (Ms V Naidoo) at 021 469 1012 or naidoo@cput.ac.za.

Regards

Dr AC de la Harpe
m. +27 82 448 1058

Prof J Cronje
m. +27 82 558 5311

Appendix B: Letter to Participants – Interviews



Dear <Participant's Name>,

I am a PhD student doing a research project to *explore and understand the disconnect between traditional management theory and the way that IT implementation work*. The aim of the study is to better understand how management theories can be applied to enable IT departments to plan the future with confidence for predictable success. As a valued stakeholder, your participation in this study is extremely important and highly appreciated. Your input will assist us in gaining valuable insight into the successful implementation of IT in the African Oil and Gas industry.

This is phase II of the research project and will be conducted in the form of an selected *structured* interviews. All interviews will be recorded. The footage will be used for the purpose of research only and will not be release to any source without written approval. Your participation is entirely voluntary. Kindly assist me in this endeavour by participating in a one-on-one interview. The interview will take approximately **60 minutes**. If you agree to participate in this research project, please complete the attached form (electronic copy attached) to be print on your organisation's letterhead, sign and return to me.

Be assured that all information provided will be treated as **confidential** and will not be used for any purpose other than the aforementioned research. If you have any questions or comments about this research project, please feel free to contact me. My email address is colindprince@yahoo.com or phone me on +27 82 325 4153.

All participants will receive a synopsis of the research findings once approved by the academic counsel.

Thank you for participating in this research project.

Sincerely yours,

Colin Prince, Ph.D. Candidate
Cape Peninsula University of Technology

Appendix C: Company Consent

<<On company letterhead>>

I, <<*insert name*>>, in my capacity as <<*insert position in company*>> at <<*insert company name*>> give consent in principle to allow **Colin Prince**, a student at the Cape Peninsula University of Technology, to collect data in this company as part of his DTech (IT) research. The student has explained to me in his introductory letter the nature of his research and the nature of the data to be collected.

This letter of consent in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. The information obtained should be used for the purpose of the research project only. All information received should be kept confidential and not disclosed on any basis without the prior written consent of <<*insert company name*>>, which consent may be withheld in <<*insert company name*>> sole discretion. I reserve the right to withdraw this permission at some future time.

In addition, the company's name may or may not be used as indicated below. (*Tick as appropriate*)

	Thesis	Conference paper	Journal article	Research poster
Yes				
No				

<<*Insert name*>>

Date

Appendix D: Individual Consent

Add Business Card

Company:

Or Tel:

Cell:

Email:

I, _____, in my capacity as _____
 (*position in company*) at _____ (*insert company name*)
 give consent in principle to allow **Colin Prince**, a student at the Cape Peninsula University of
 Technology, to collect data in this company as part of his DTech (IT) research. The student
 has explained to me the nature of his research and the nature of the data to be collected.

This letter of consent in no way commits any individual staff member to participate in the
 research, and it is expected that the student will get explicit consent from any participants. I
 reserve the right to withdraw this permission at some future time.

In addition, the company's name may or may not be used as indicated below. (Tick as
 appropriate)

	Thesis	Conference paper	Journal article	Research poster
Yes				
No				

 Name:
 Title:

 Date

Appendix E: C-level Questionnaire



C-Level Questionnaire



NO OBLIGATION: Participation in this study is none-compulsory and out of free will. All participants will receive a synopsis of the research findings once approved by the Academic Council.

Name:
Designation:
Company:
Contact Information:
Office Number
Mobile
Email

Topic: Information Technology in a Complex Economy: The African Oil and Gas Industry

Aim: To determine the role of MANAGEMENT THEORY in the successful implementation of IT in the Oil and Gas industry in Africa.

Research Problem: The implementation of an effective and efficient IT department remains problematic for business and IT management as traditional management theory does not necessarily support the implementation of IT within organisations.

Instruction: Read each statement and choose the option that best describes your opinion of IT within your organisation.

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
IT delivers a secure and reliable service					
IT engages with business leaders proactively on new ideas and system enhancements					
As an enabler of business, IT participates in business strategy formulation					
IT delivers solutions that enable organisational growth and transformation					
The use of IT (such as mobility; big data management; business intelligence; etc.) accelerates organisational performance					
IT participates in the engineering and continuous improvement of business processes					
IT is an enabler of the organisational vision					
IT personnel have the business acumen to serve our organisation					
IT plays a facilitators role in organisational change					
IT provides timely, relevant and the right data to decision makers					
Knowledge Management assists with the development of new products and services					
IT contributes to the bottom line of our organisation					
The IT structure services the needs of our organisation					
IT provides the platform to reach our customers and service partners					
IT is turning business problems into opportunities					
IT is an integral part of our business					
Strategic partnerships is a key growth area for business over the next 5 years					
Our organisation has a dashboard that shows employees how they perform and contribute to the achievement of the organisational goals and objectives					
CIOs and IT Management need to have domain knowledge of their company					
The role of IT is changing and is more critical than before					
IT needs to be agile, innovative and forward looking while learning from previous mistakes - doing it faster, better, smarter and cheaper					
In Africa, 80% of all Business IT projects are delivered within the triple constraints of time, cost and quality					
Enterprise Architecture provides the flexibility to support current and future operations while competing in a competitive world					
Communication is key to sustainable alignment					
Positive behaviour builds constructive relationships					
A committed workforce leads to increased efficiency					
Cultural diversity has a positive impact on organisational behaviour, which increases performance and productivity					
High emotional intelligence leads to better conflict resolution in the workplace					
General: In your view, what should your internal IT department do to ensure successful implementation of IT in the Oil and Gas industry in Africa? <div style="border: 1px solid black; height: 40px; width: 100%;"></div>					

Signed at _____ (place) on this the _____ day of _____ 20__.

Signature

Appendix F: CIO / ISM Questionnaire



CIO / ISM Questionnaire



NO OBLIGATION: Participation in this study is none-compulsory and out of free will. All participants will receive a synopsis of the research findings once approved by the Academic Council.

Name: _____
Designation: _____
Company: _____
Contact Information:
Office Number _____
Mobile _____
Email _____

Topic: Information Technology in a Complex Economy: The African Oil and Gas Industry
Aim: To determine the role of MANAGEMENT THEORY in the successful implementation of IT in the Oil and Gas industry in Africa.
Research Problem: The implementation of an effective and efficient IT department remains problematic for business and IT management as traditional management theory does not necessarily support the implementation of IT within organisations.
Instruction: Read each statement and choose the option that best describes your opinion of IT within your organisation.

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
IT engages with business leaders proactively on new ideas and system enhancements					
As an enabler of business, IT participates in business strategy formulation					
IT is turning business problems into opportunities					
IT is an integral part of our business					
Strategic partnerships is a key growth area for business over the next 5 years					
CIOs and IT Management need to have domain knowledge of their company					
When recruiting, we are looking for technical resources with a sound knowledge (acumen) of the operations of our organisation					
Emotional intelligence is an important element of our recruitment and selection process					
We deliver products, services and processes that create value for our organisation					
Our staff contribute more to the organisation's objectives if they are treated as responsible and valuable employees					
We communicate authentically with the business on all projects, incidents, problems and changes					
Our solutions are simple to use and draw on the same data sources across the enterprise					
IT has a clearly articulated partnership strategy					
Coaches are assigned to employees at all levels in the organisation to drive transformation of people, processes and technology					
Innovation is the deployment of industry practices as a new process to our organisation					
Transforming business strategy into a business architecture is a core value proposition of IT					
IT optimises, reuses, rationalises, consolidates, sustains and standardises technology and processes to timely meet business requirements in a changing environment, driving business efficiency and profitability					
IT innovation enables our organisation to stay ahead of our competitors					
The role of IT is changing and is even more critical than before					
IT needs to be agile, innovative and forward looking while learning from previous mistakes - doing it faster, better, smarter and cheaper					
In Africa, 80% of all Business IT projects are delivered within the triple constraints of time, cost and quality					
All IT services generate shareholder commitment while enabling benefit realisation and growth for business					
When referring to business, we refer to them as partners and not as clients or users					
Enterprise Architecture provides the flexibility to support current and future operations while competing in a competitive world					
Strategic partnerships allow the (internal) IT department to drive competitive differentiation faster					
Strategic Partnership Management skills are different from Vendor Management					
Communication is key to sustainable alignment					
Positive behaviour builds constructive relationships					
A committed workforce leads to increased efficiency					
High emotional intelligence leads to better conflict resolution in the workplace					
Practical intelligence is useful in resolving IT-related work problems					
Partnering and collaborative relationships should benefit both parties					
Strategic partnerships provide access to scarce and complementary skills					
Cultural diversity has a positive impact on organisational behaviour, which increases performance and productivity					
IT has clearly defined business objectives and solution requirements, and knows what success looks like					
General: In your view, what should business do to ensure successful implementation of IT in the Oil and Gas industry in Africa? _____ _____ _____					

Signed at _____ (place) on this the _____ day of _____ 20__.

Signature

Appendix G: External Service Provider Questionnaire



External Service Provider Questionnaire



NO OBLIGATION: Participation in this study is none-compulsory and out of free will. All participants will receive a synopsis of the research findings once approved by the Academic Council.

Name: _____
 Designation: _____
 Company: _____
 Contact Information:
 Office Number _____
 Mobile _____
 Email _____

Topic: Information Technology in a Complex Economy: The African Oil and Gas Industry

Aim: To determine the role of MANAGEMENT THEORY in the successful implementation of IT in the Oil and Gas industry in Africa.

Research Problem: The implementation of an effective and efficient IT department remains problematic for business and IT management as traditional management theory does not necessarily support the implementation of IT within organisations.

Instruction: Read each statement and choose the option that best describes your opinion of IT within your organisation.

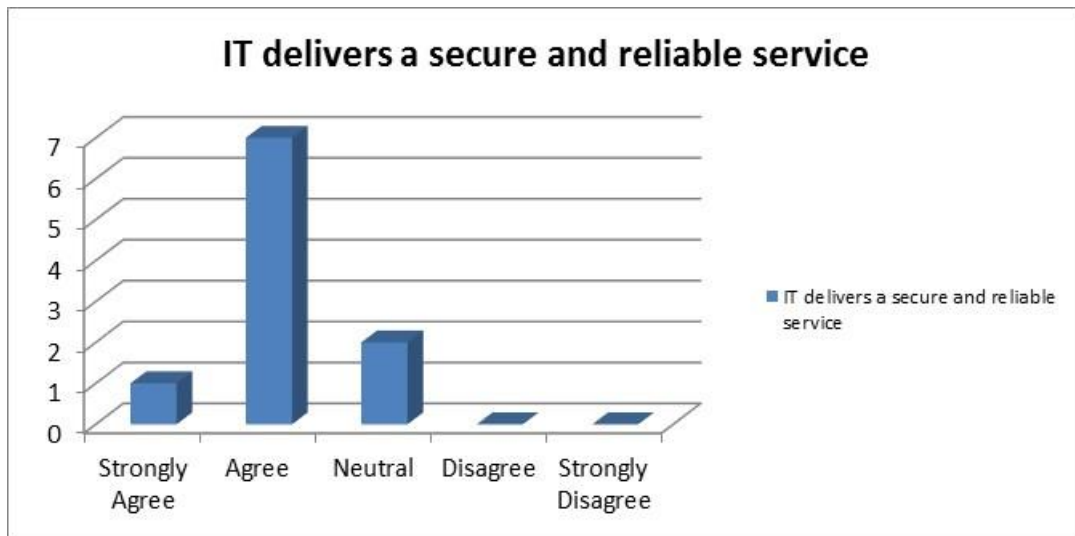
Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
IT engages with business leaders proactively on new ideas and system enhancements					
IT is turning business problems into opportunities					
We optimise, reuse, rationalise, consolidate, sustain and standardise technology and processes to timely meet business requirements in a changing environment, driving business efficiency and profitability					
The role of IT is changing and is even more critical than before					
IT needs to be agile, innovative and forward looking while learning from previous mistakes - doing it faster, better, smarter and cheaper					
In Africa, 80% of all Business IT projects are delivered within the triple constraints of time, cost and quality					
Enterprise Architecture provides the flexibility to support current and future operations while competing in a competitive world					
Strategic partnerships allow the internal IT department to drive competitive differentiation faster					
Strategic Partnership Management skills are different from Vendor Management					
Communication is key to sustainable alignment					
Positive behaviour builds constructive relationships					
A committed workforce leads to increased efficiency					
High emotional intelligence leads to better conflict resolution in the workplace					
Practical intelligence is useful in resolving IT-related work problems					
Partnering and collaborative relationships should benefit both parties					
Strategic partnerships provide access to scarce and complimentary skills					
Our client's internal IT department knows their business strategy					
We deliver products, services, solutions and processes that create value for our customers					
Solution merits are defined by profitable deployment					
Strategic partnerships is a key enabler of growth for both IT and Business					
Our solutions in Africa are sold and supported based on a broad set of strategic, marketing, operational and technical skills					
We provide repeatable, standardised methodologies and procedures in delivering services					
We ensure that our customer maximises the use of our products					
We bring quality innovation to the table					
Our solutions road maps are aligned with our client's growth requirements					
Our customer provides us with opportunities to participate in new initiatives					
Our customer's technical staff are of high quality with adequate skills (including business acumen and IQ) and staffing levels					
Our customer has clearly defined business objectives and solution requirements, and knows what success looks like					
Our customers have clearly articulated strategic partnership strategies					
Cultural diversity has a positive impact on organisational behaviour, which increases performance and productivity					
Our customer behaves in a collaborative manner					
General: In your view, what should the internal IT department do to ensure successful implementation of IT in the Oil and Gas industry in Africa?					

Signed at _____ (place) on this the _____ day of _____, 20__.

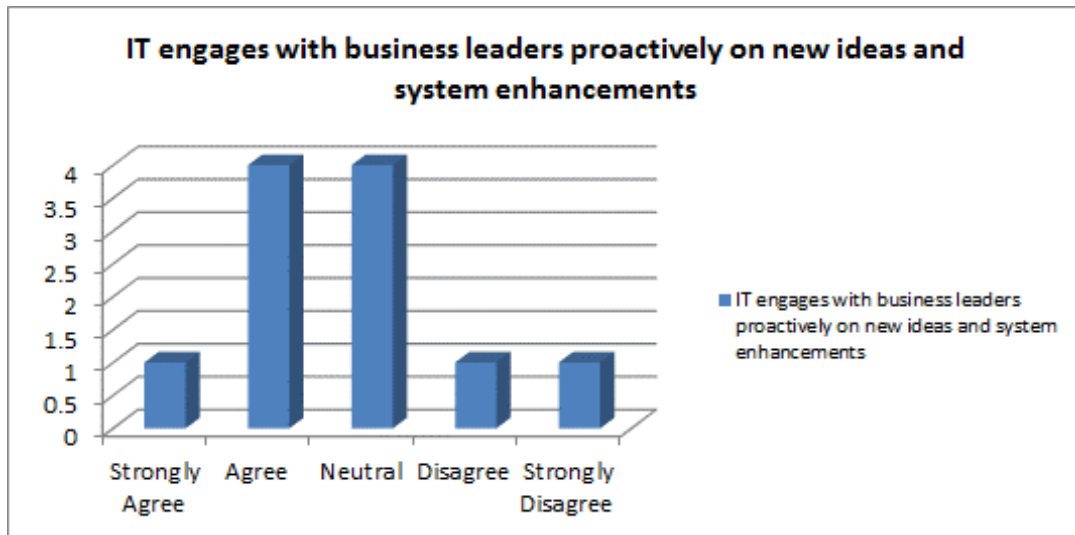
Signature

Appendix H: C-level Results (Stage I)

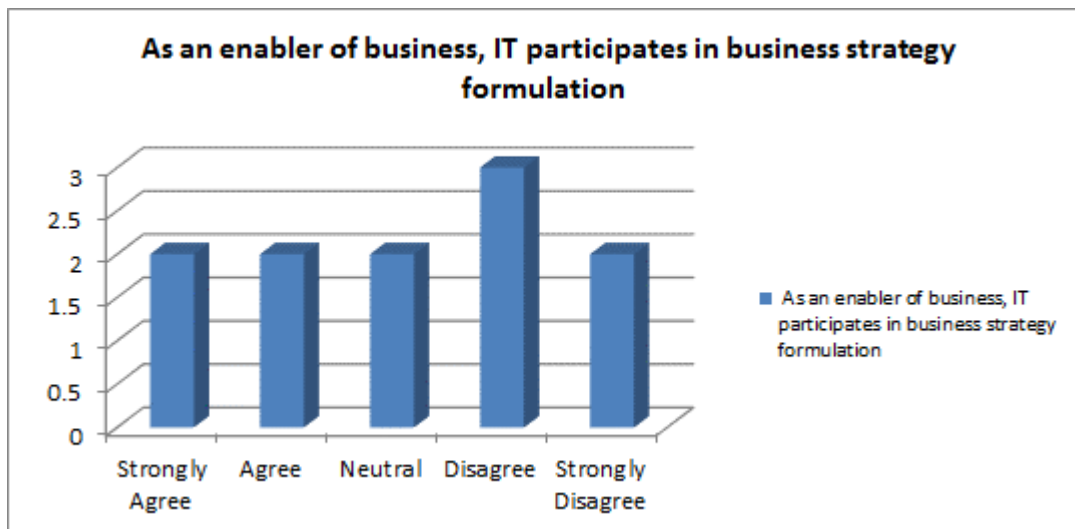
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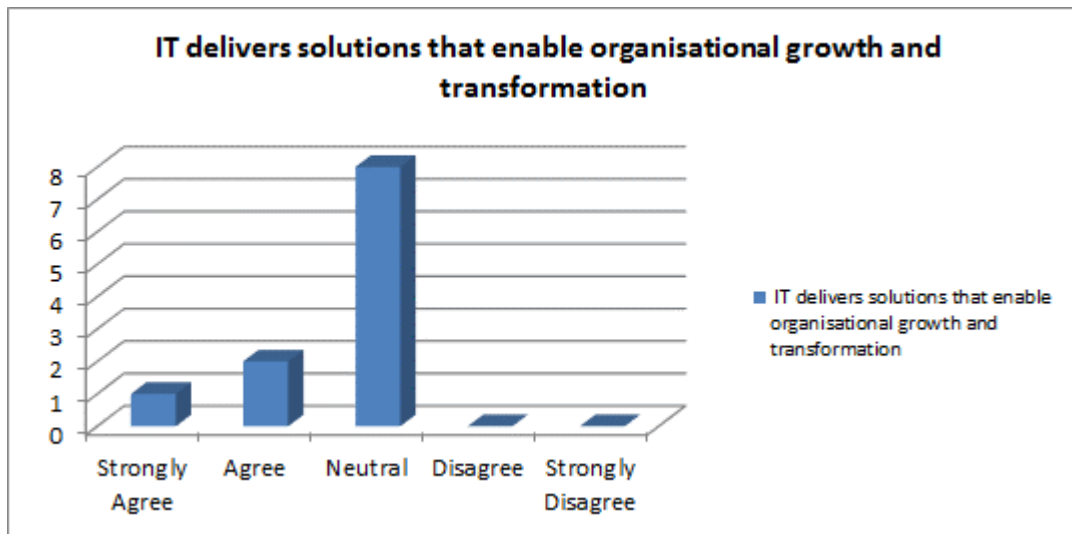
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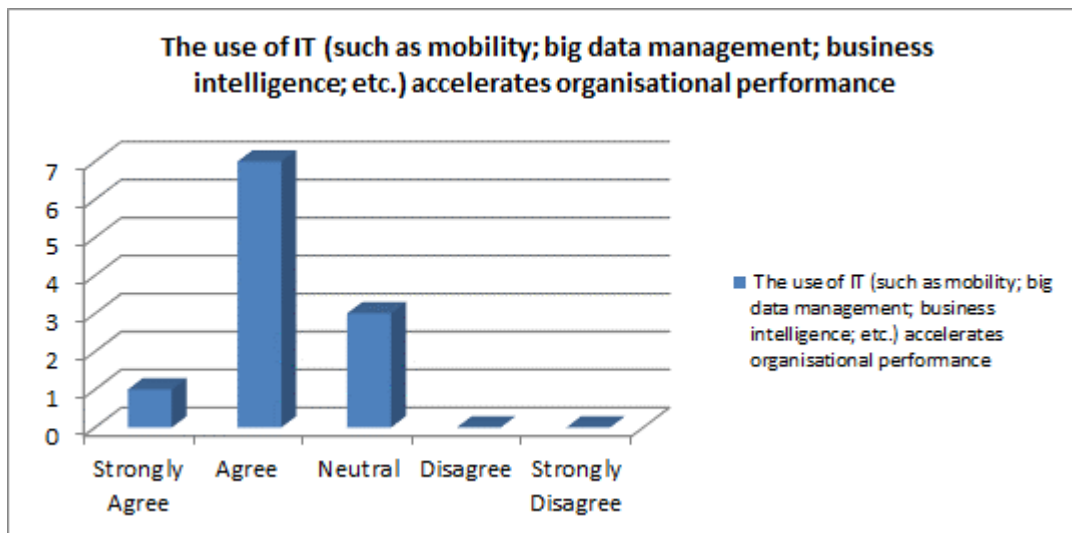
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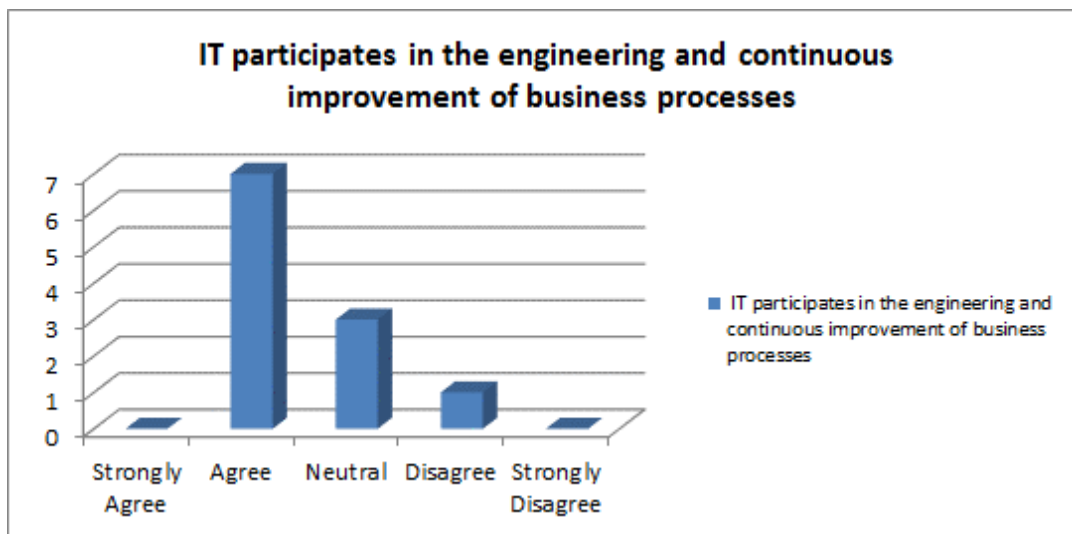
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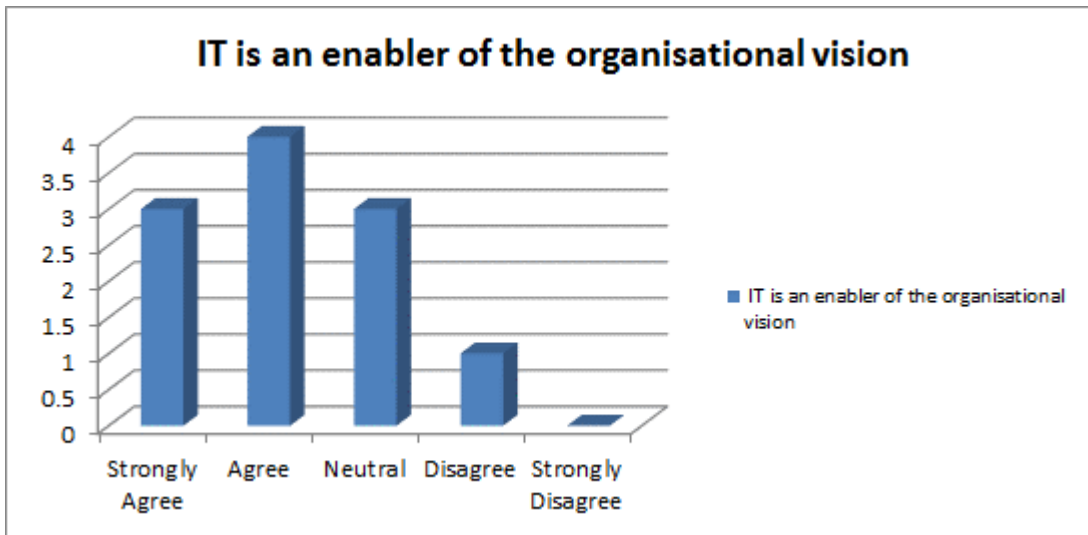
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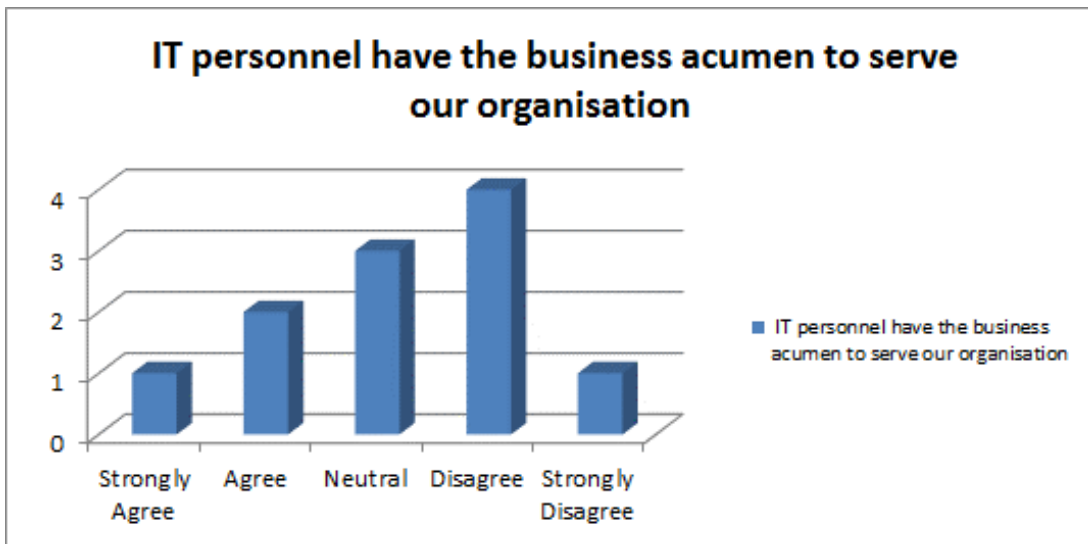
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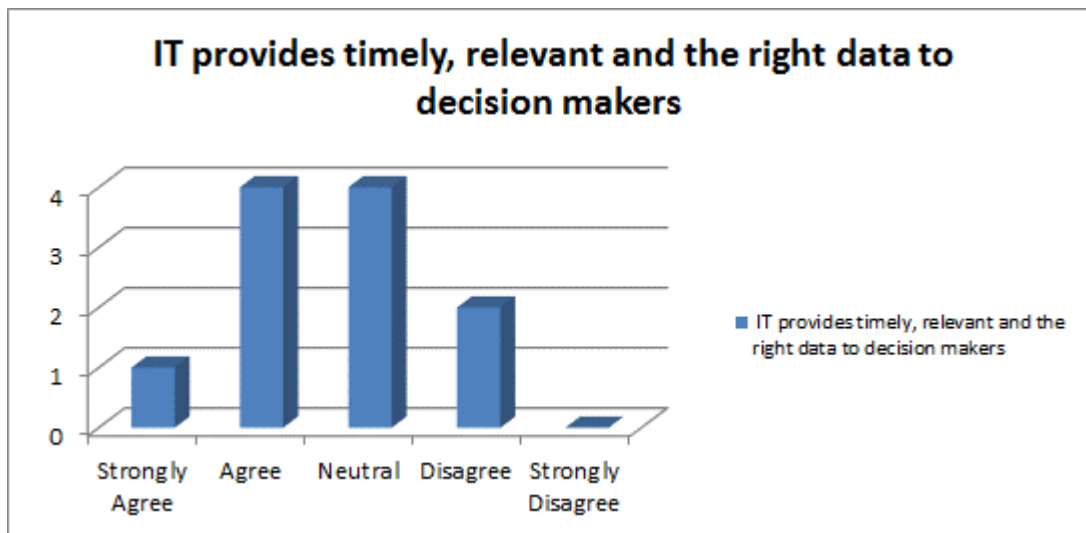
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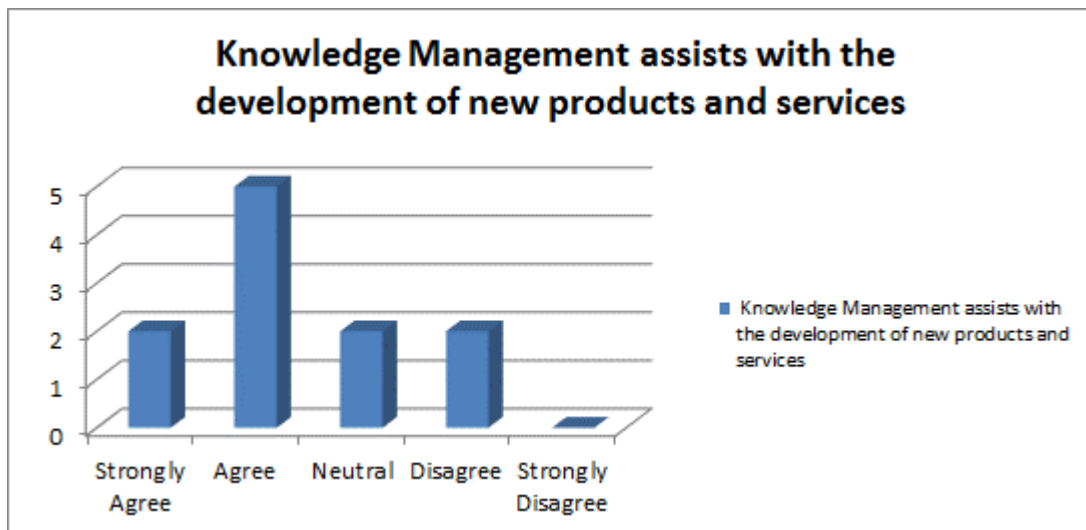
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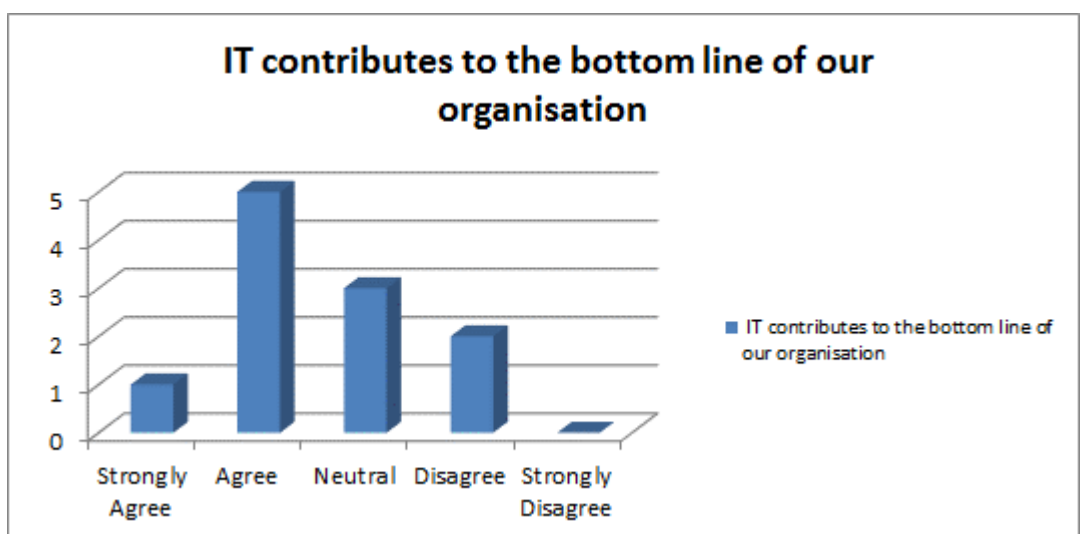
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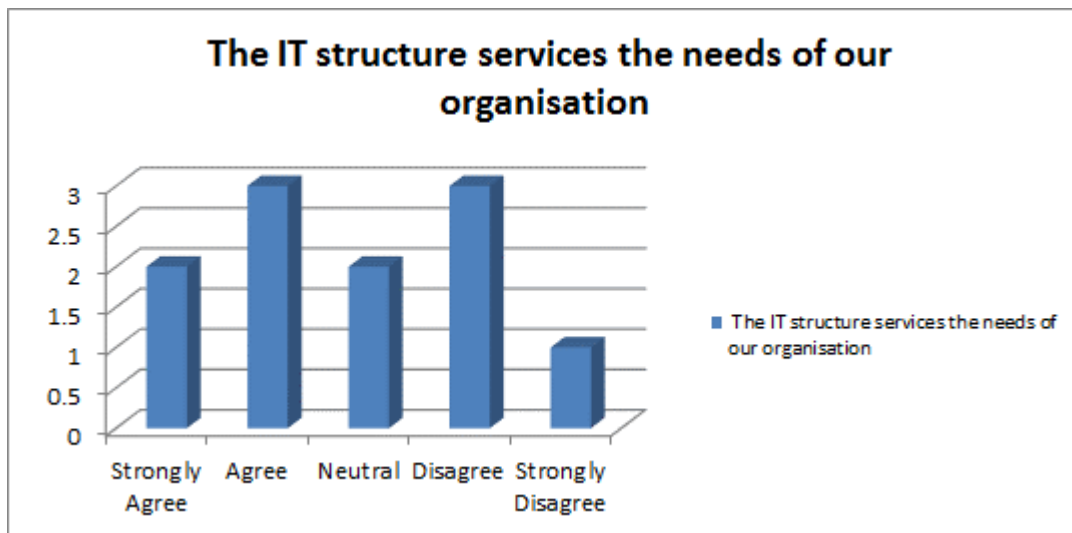
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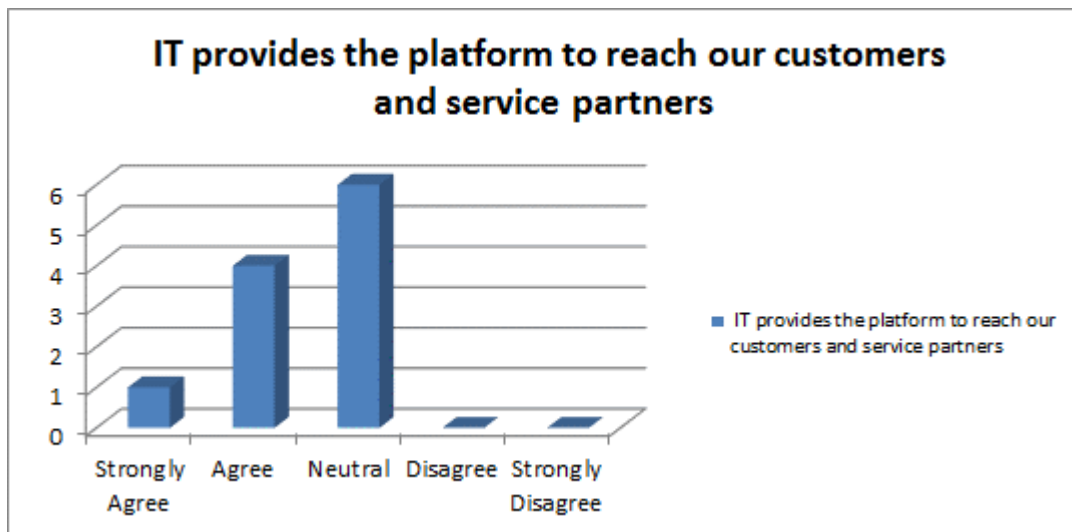
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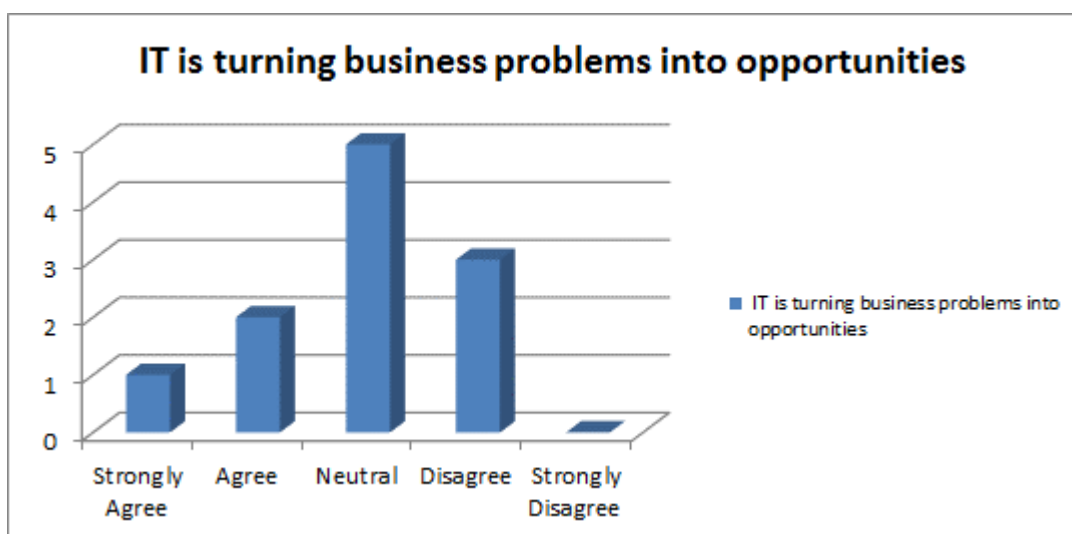
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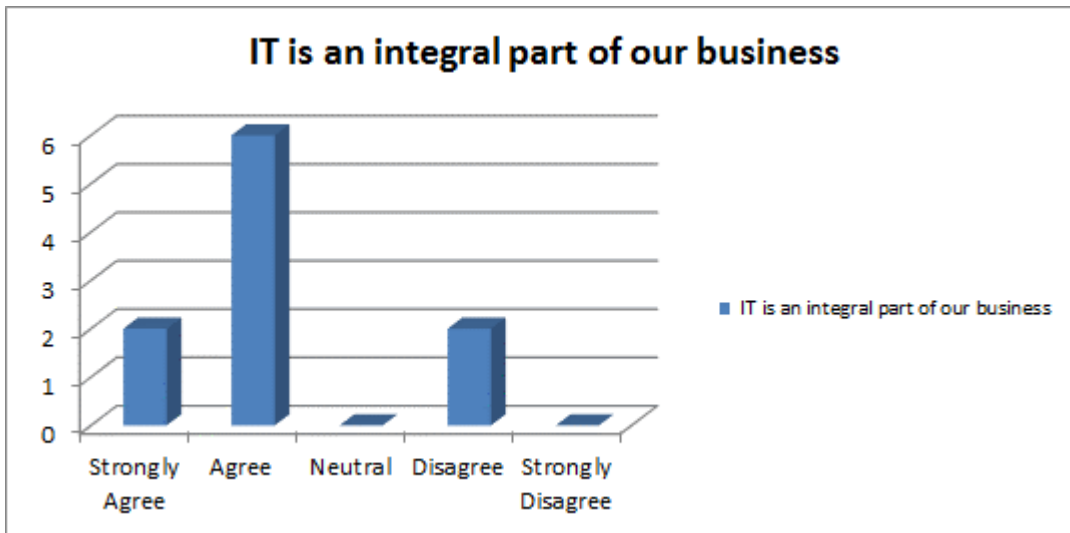
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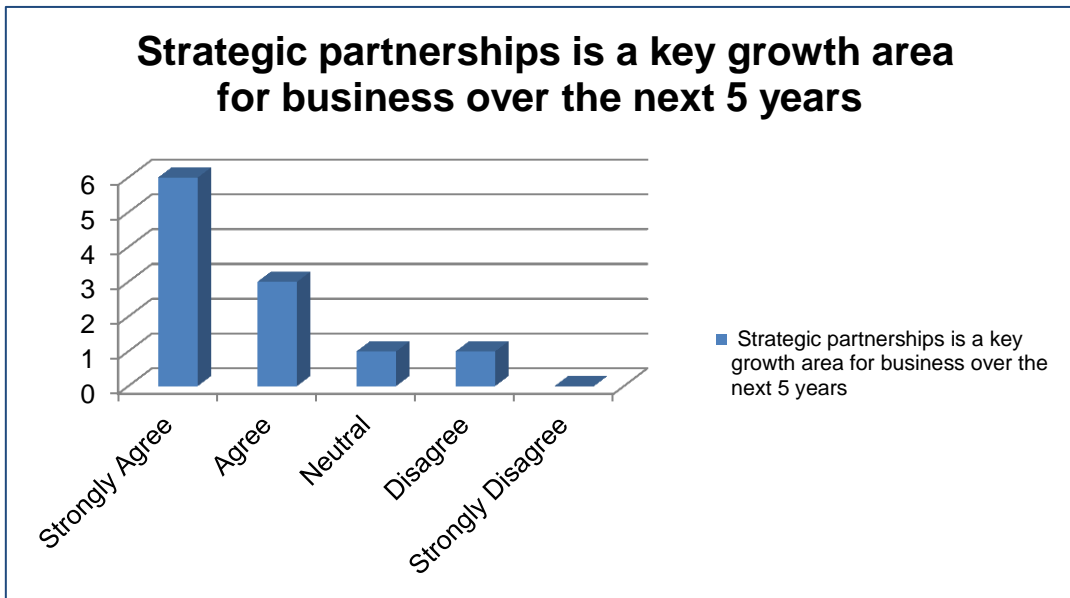
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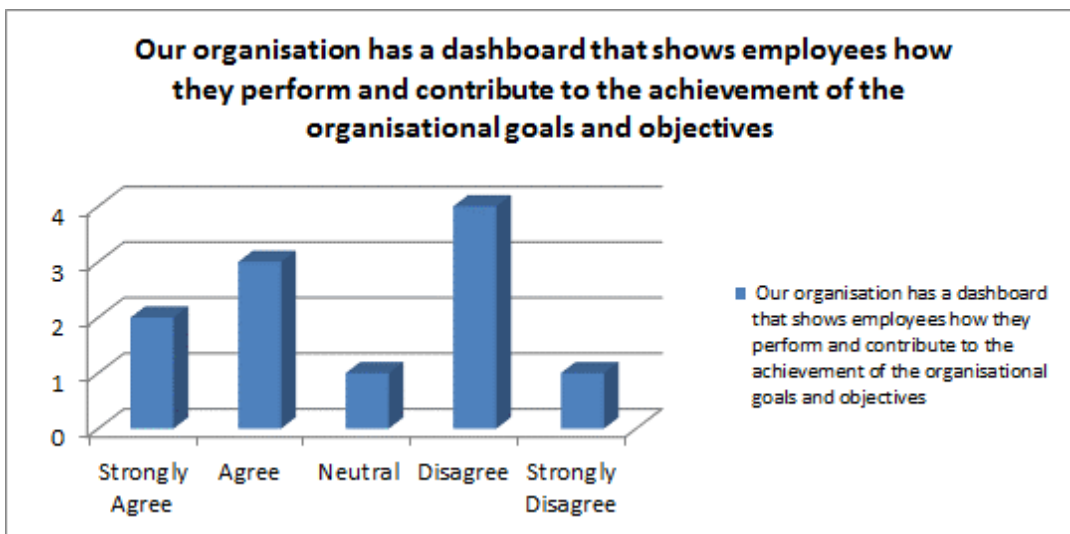
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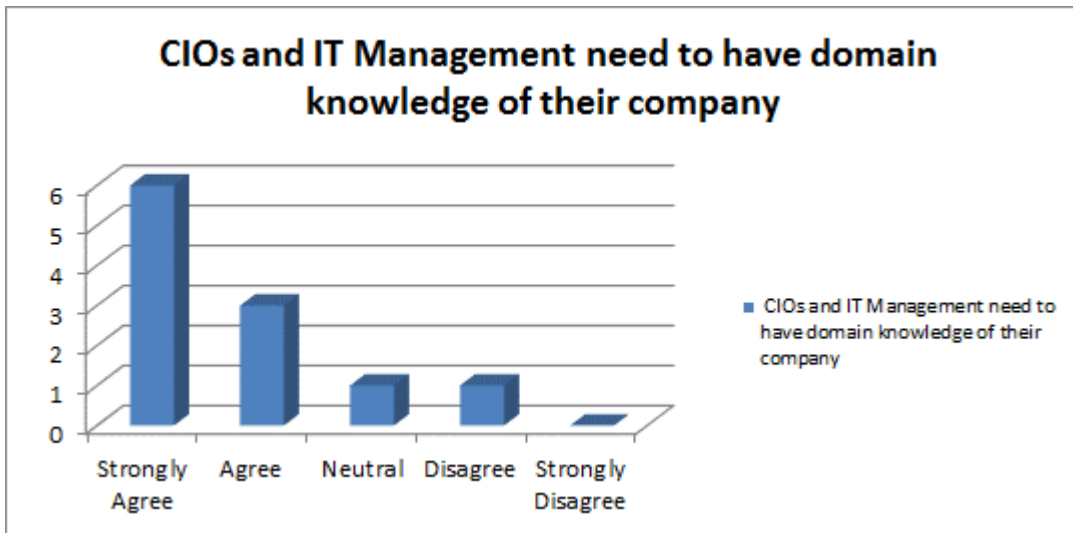
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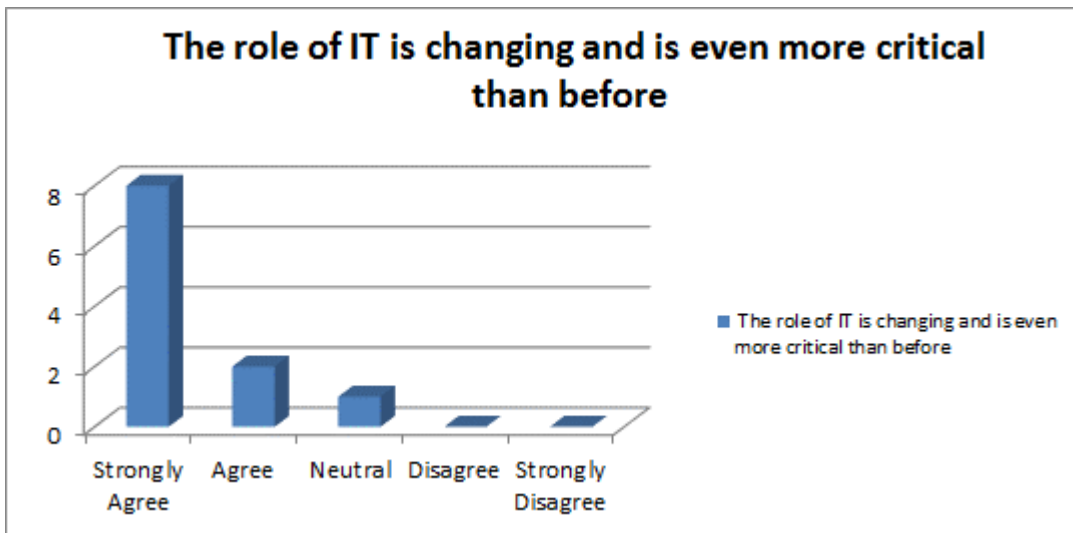
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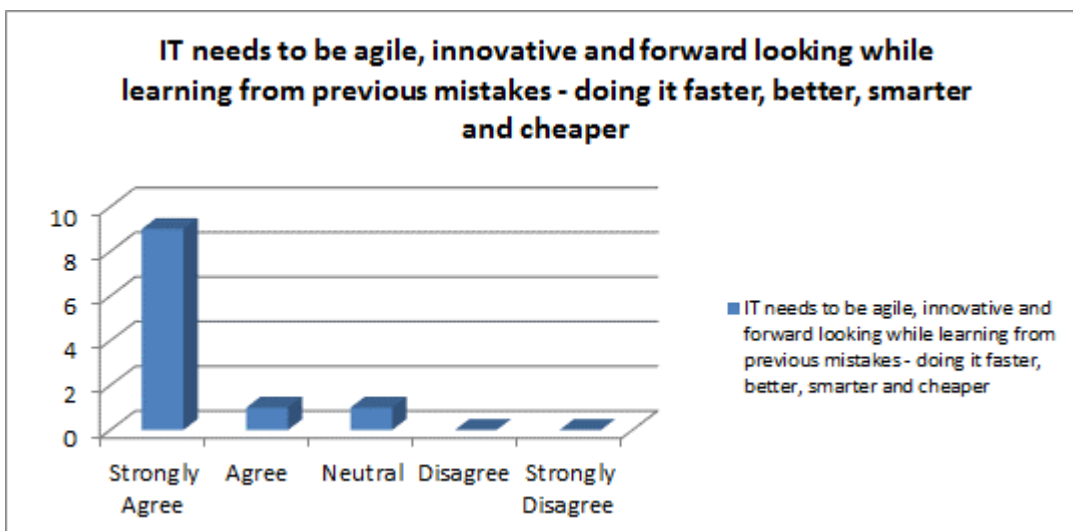
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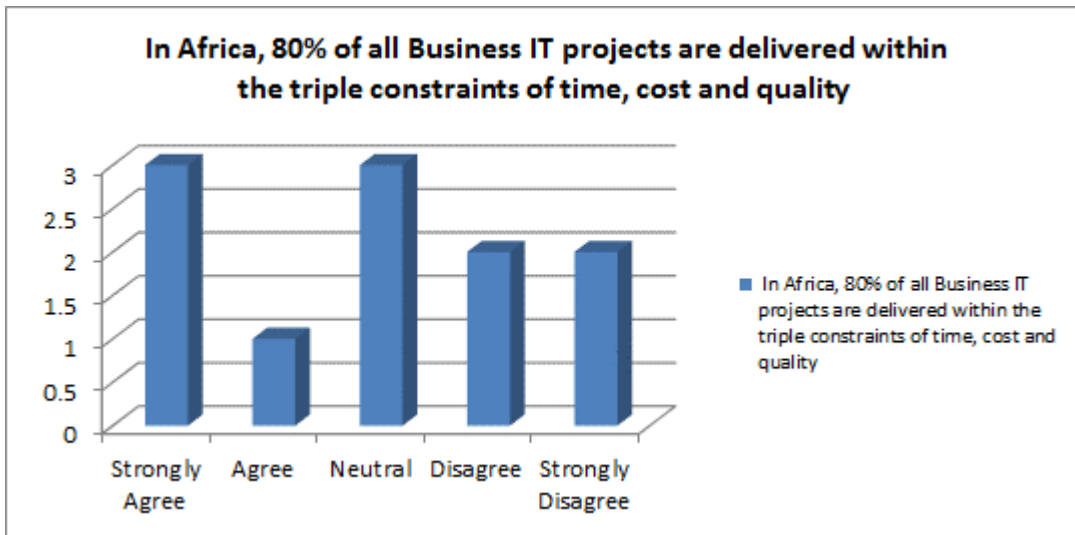
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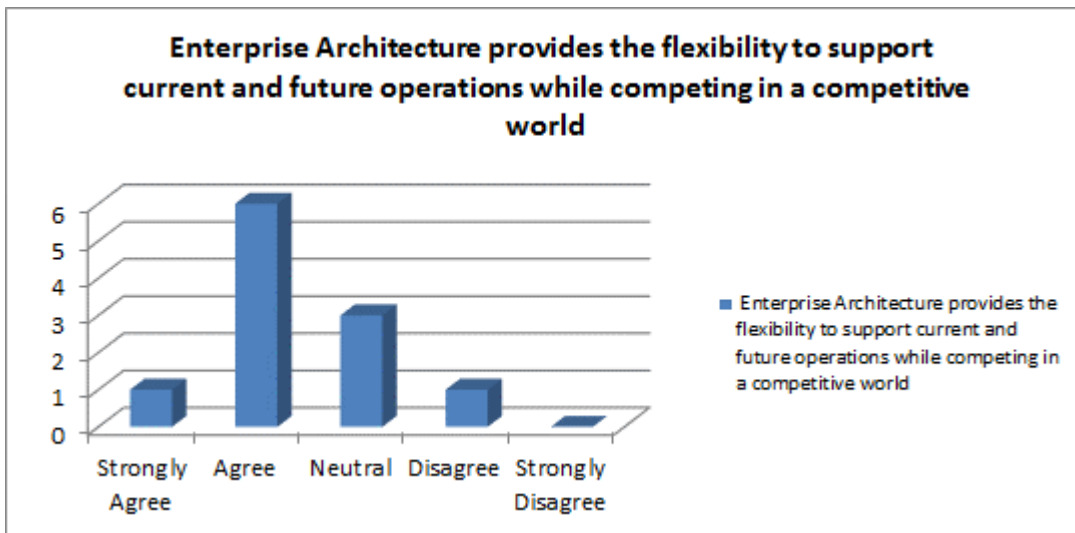
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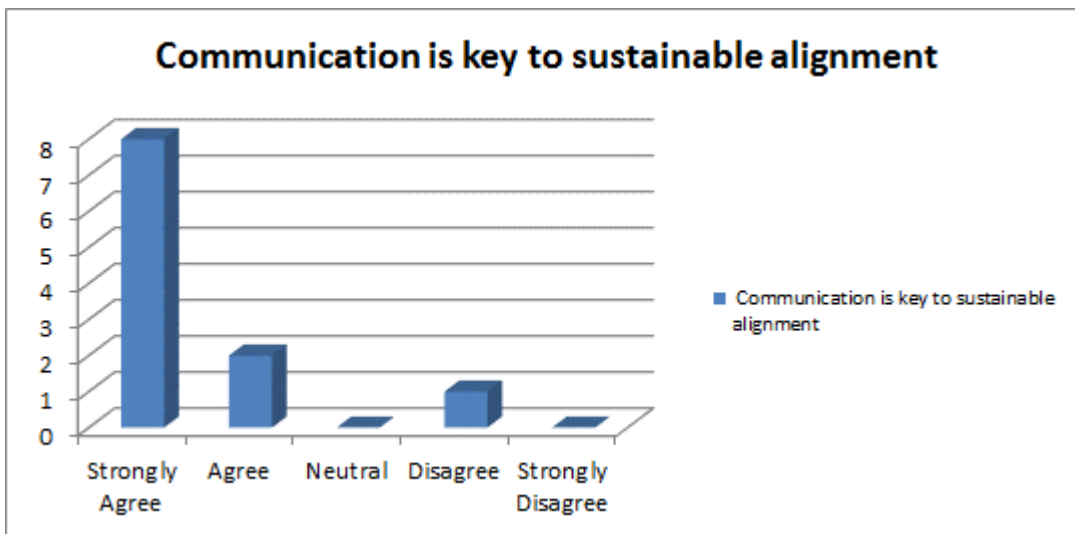
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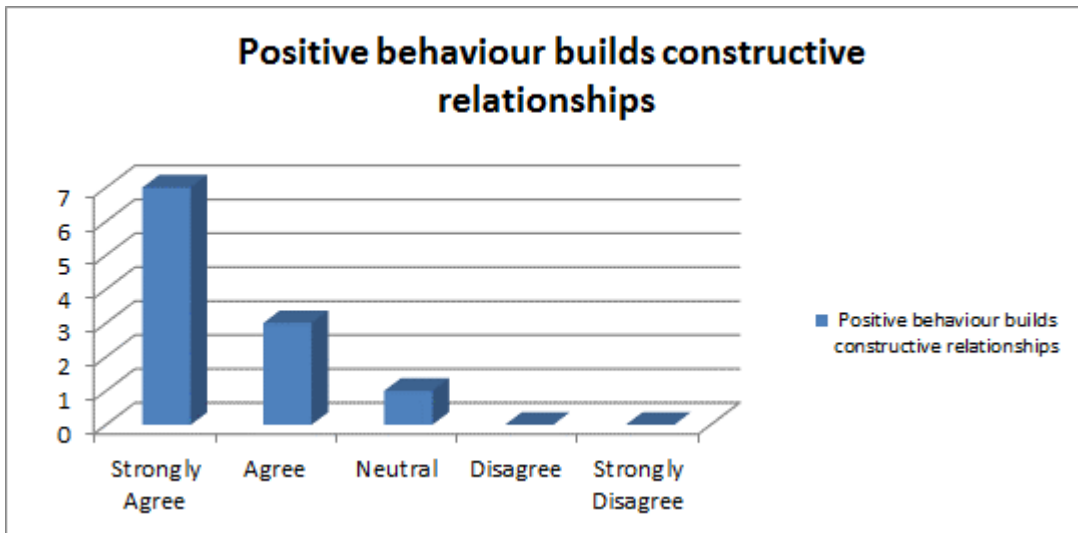
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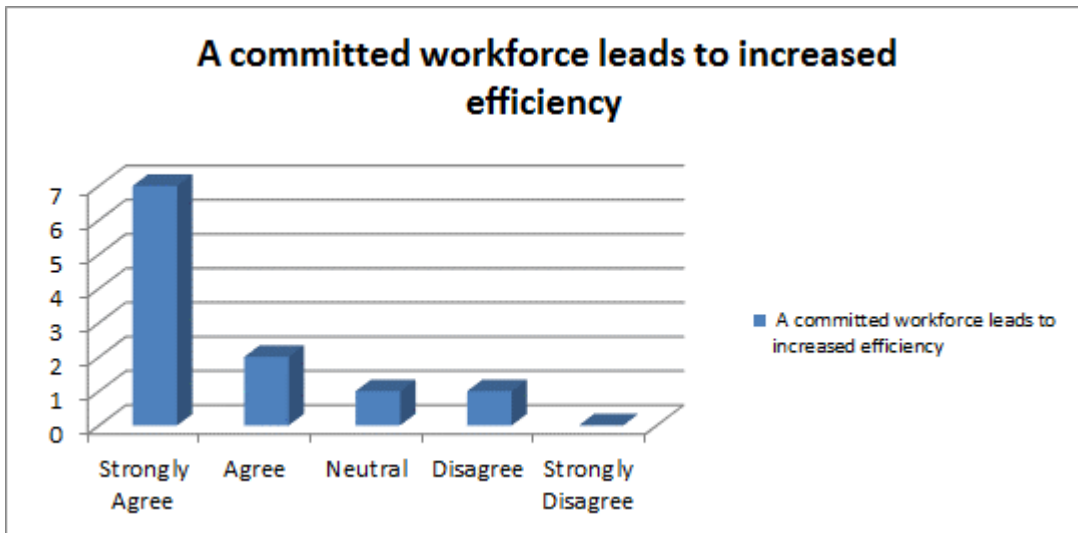
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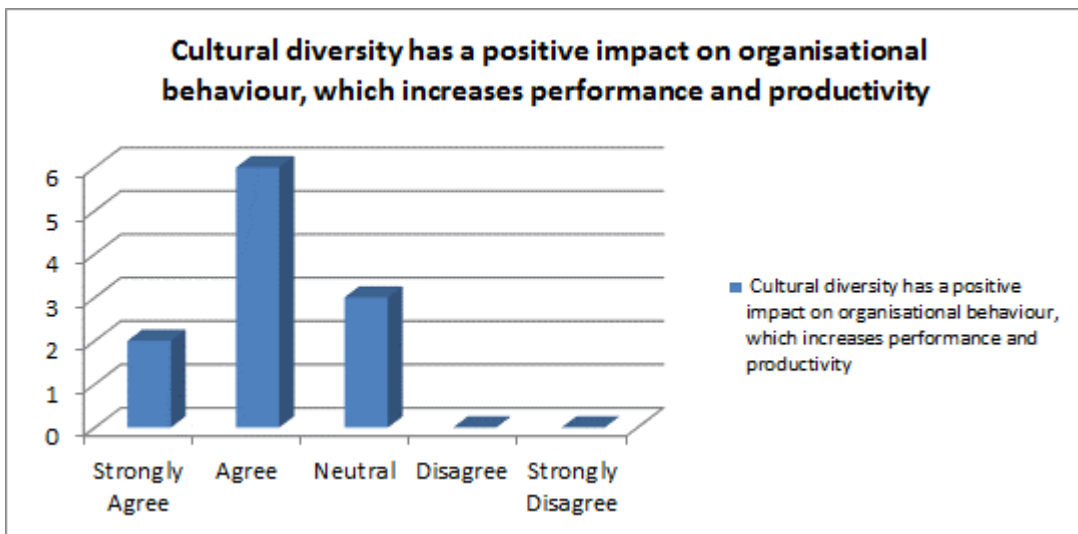
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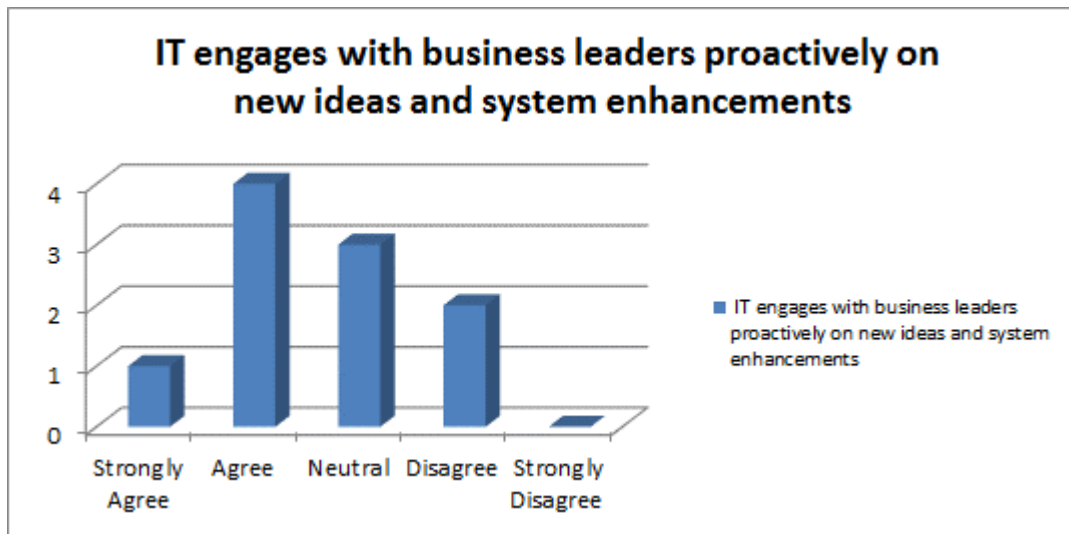
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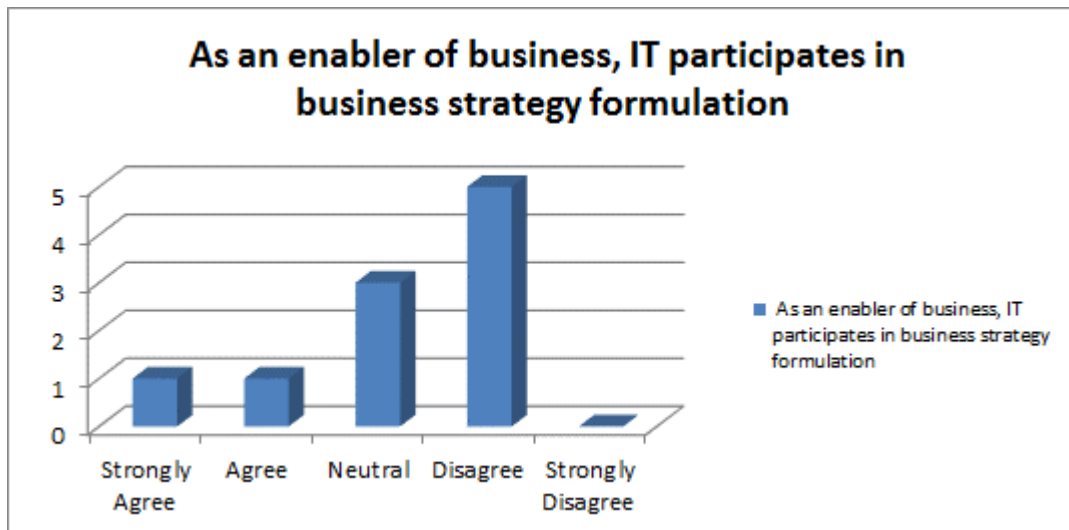


Appendix I: CIO Results (Stage I)

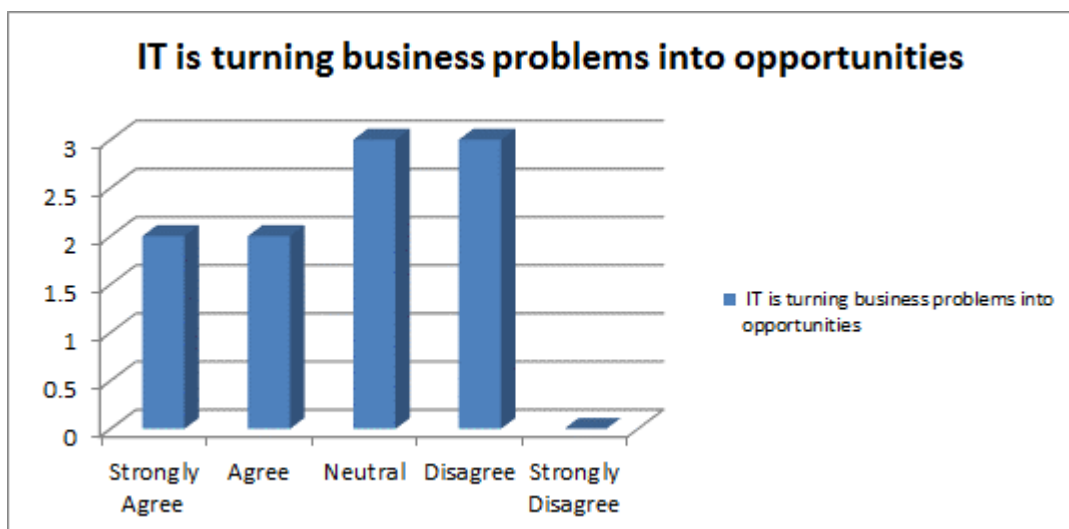
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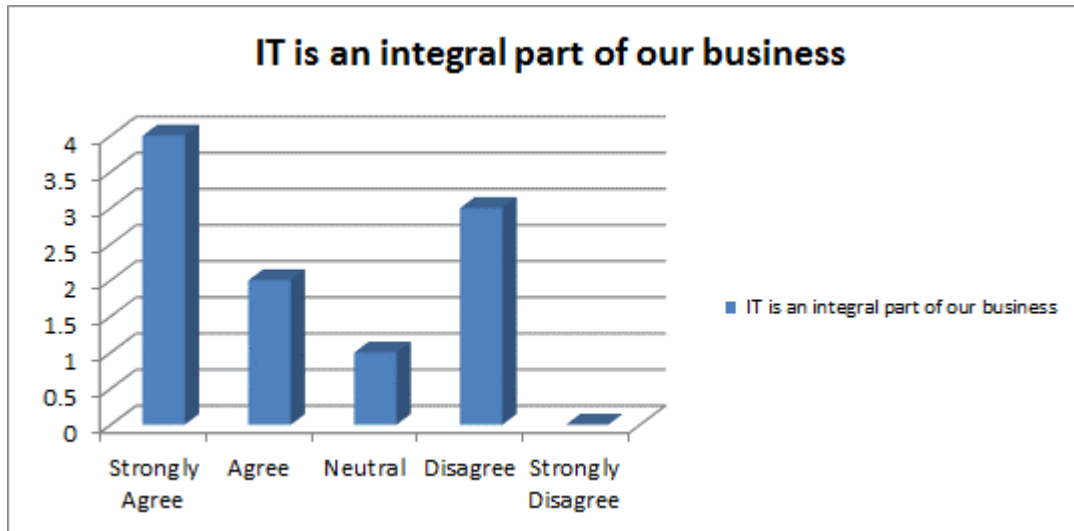
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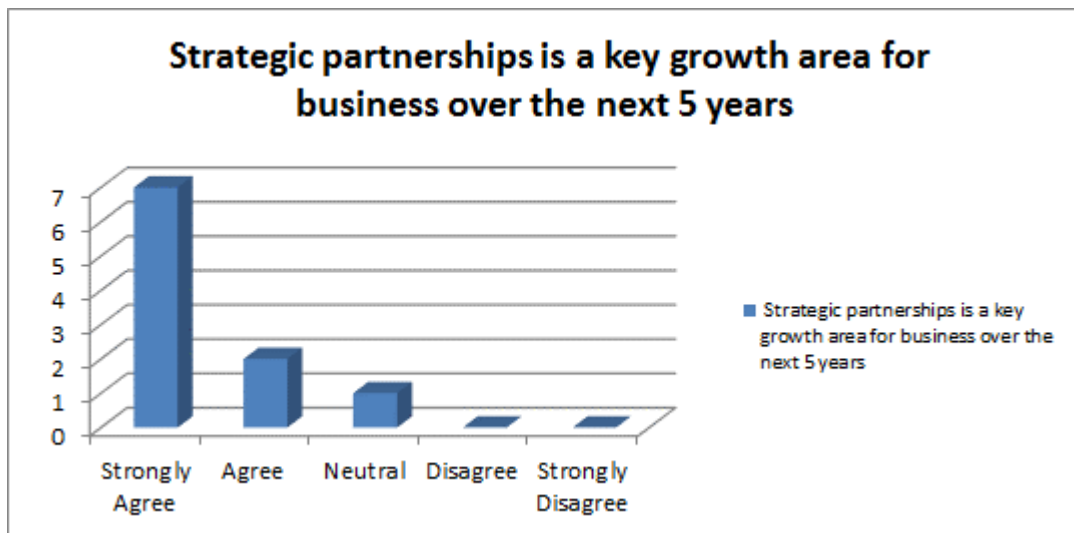
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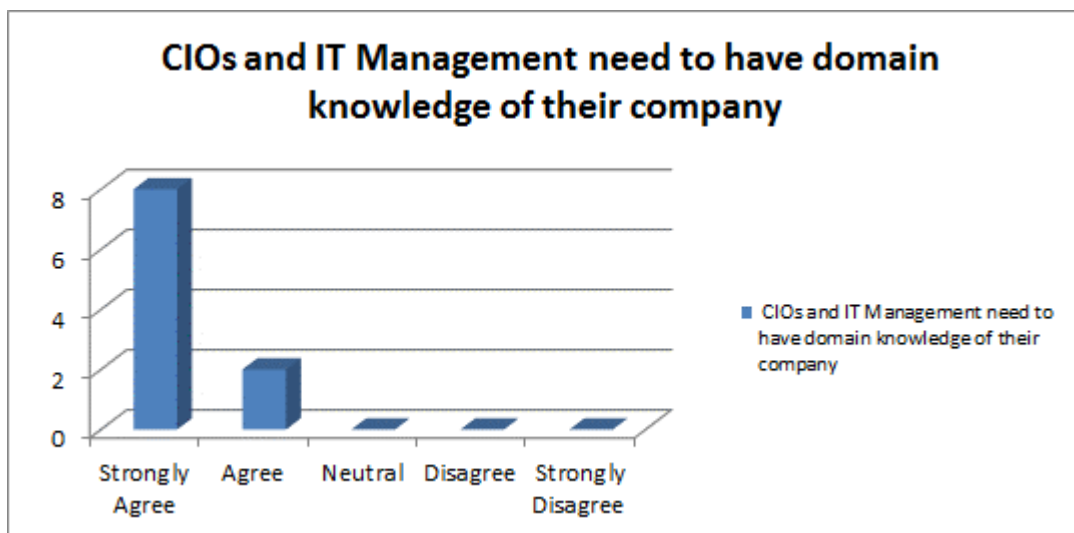
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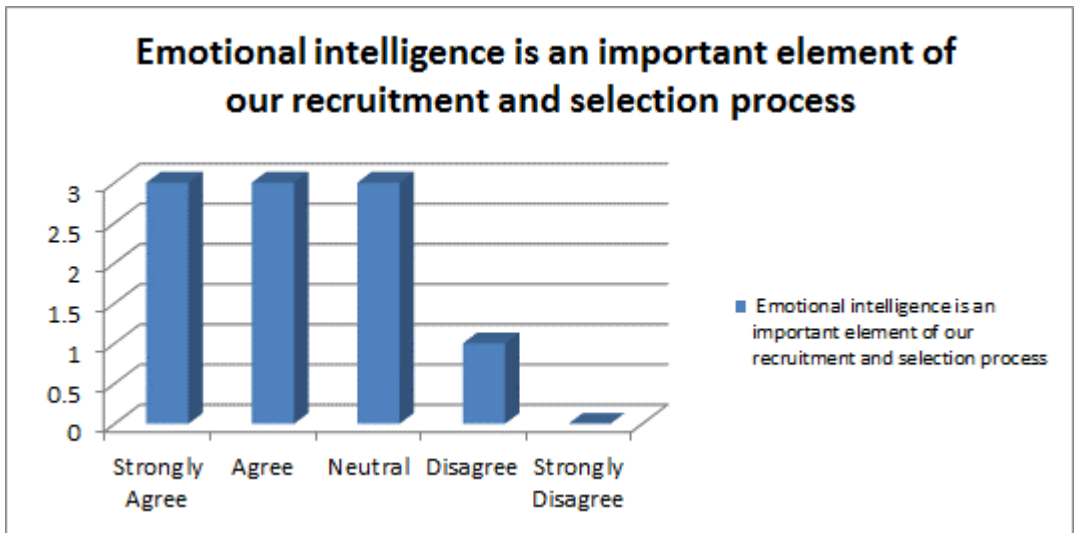
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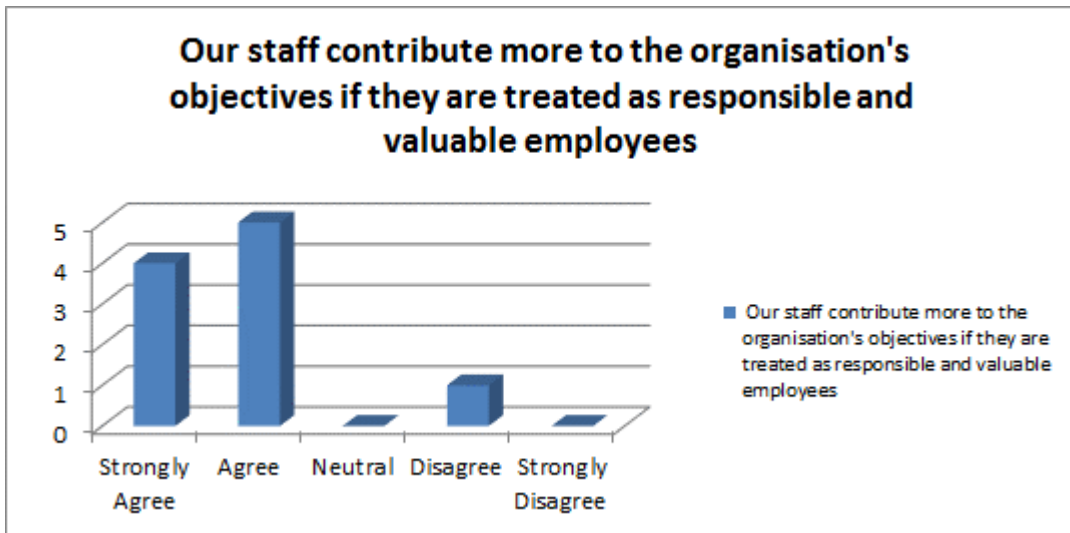
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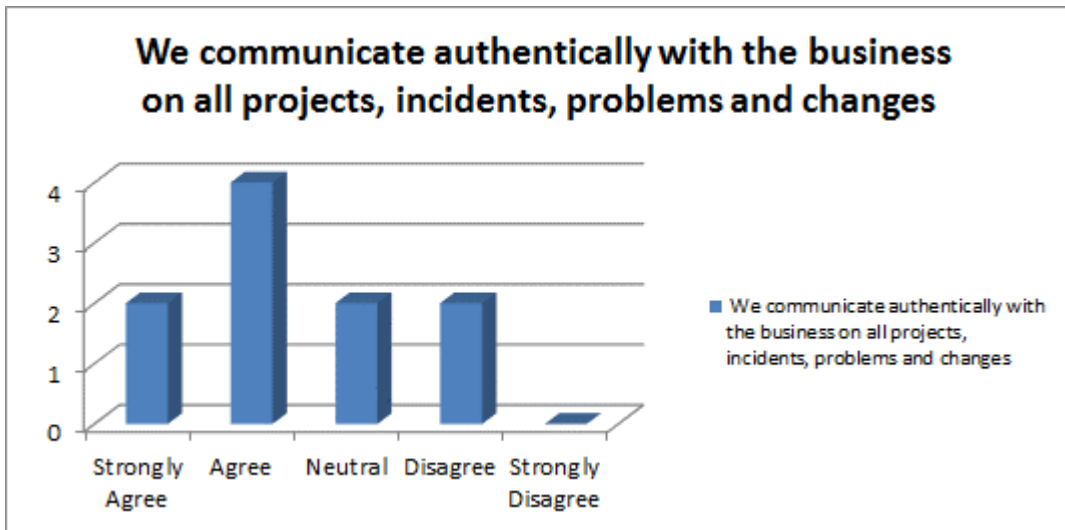
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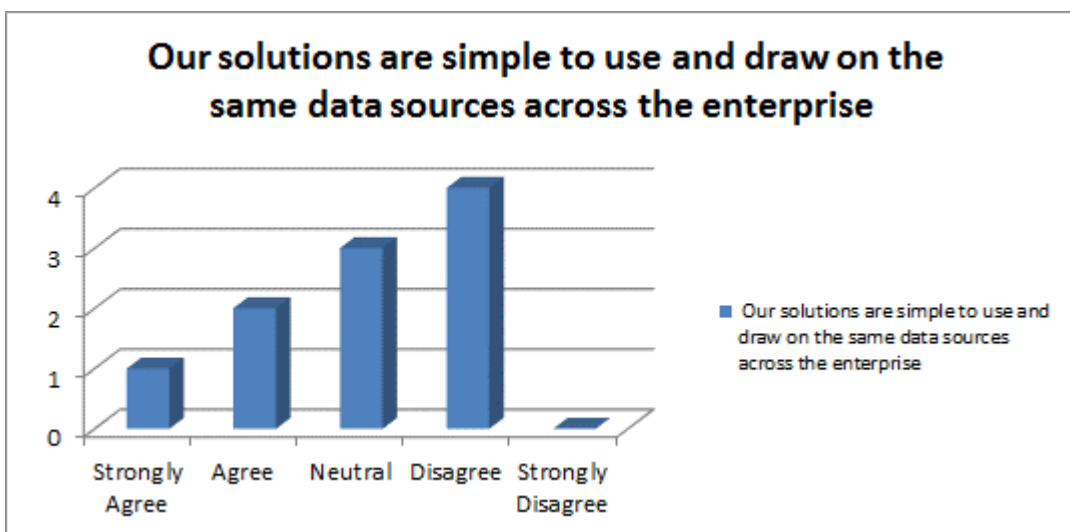
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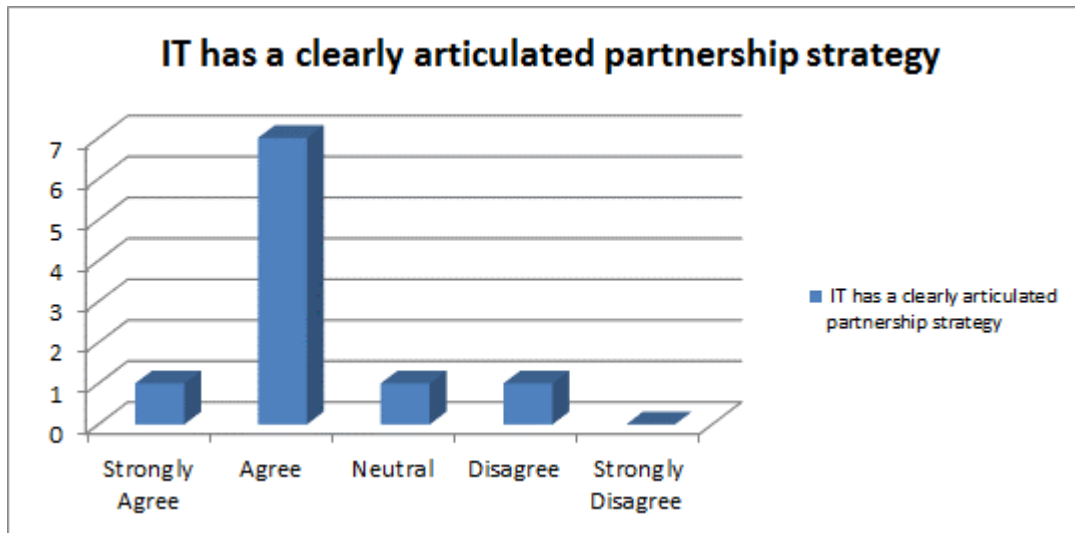
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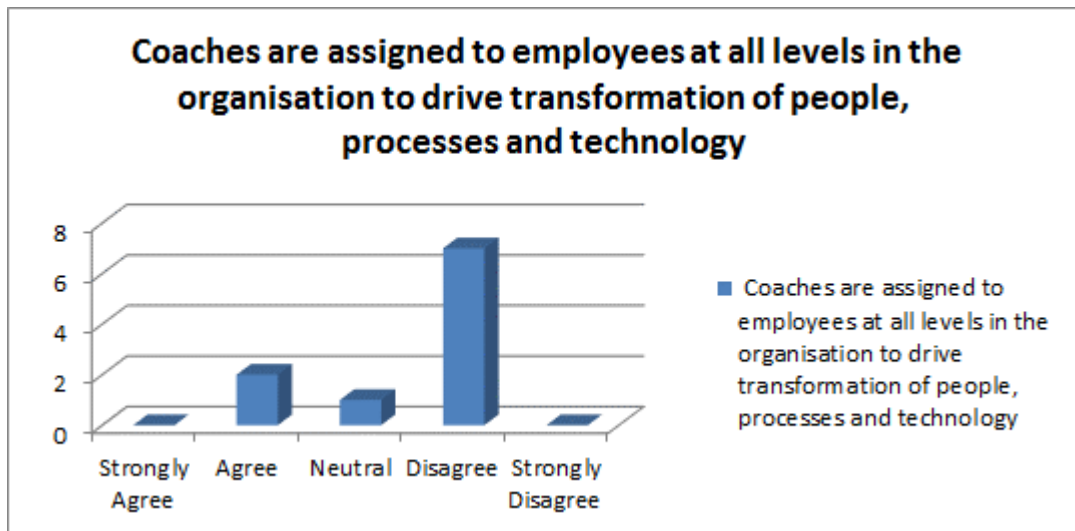
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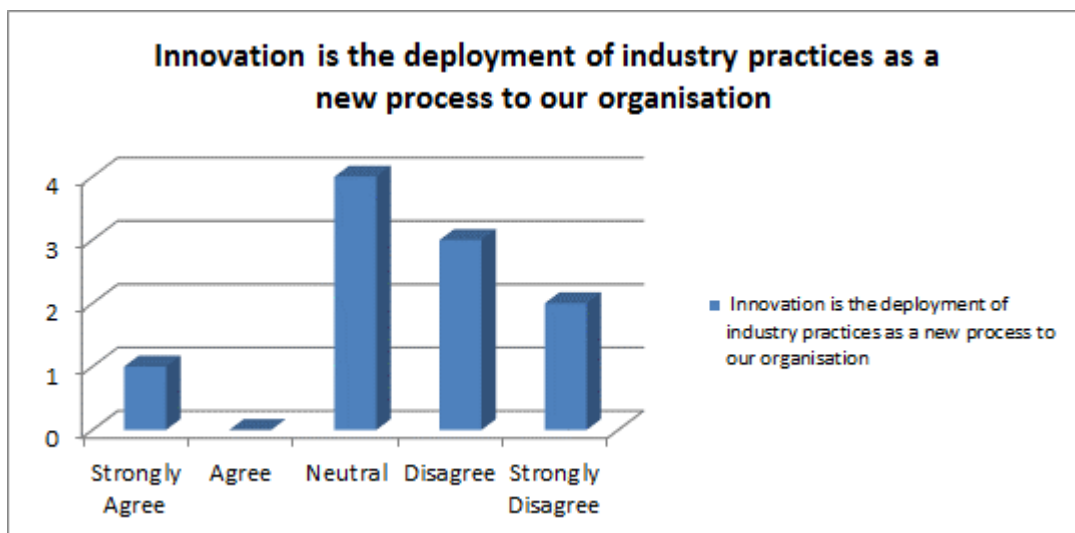
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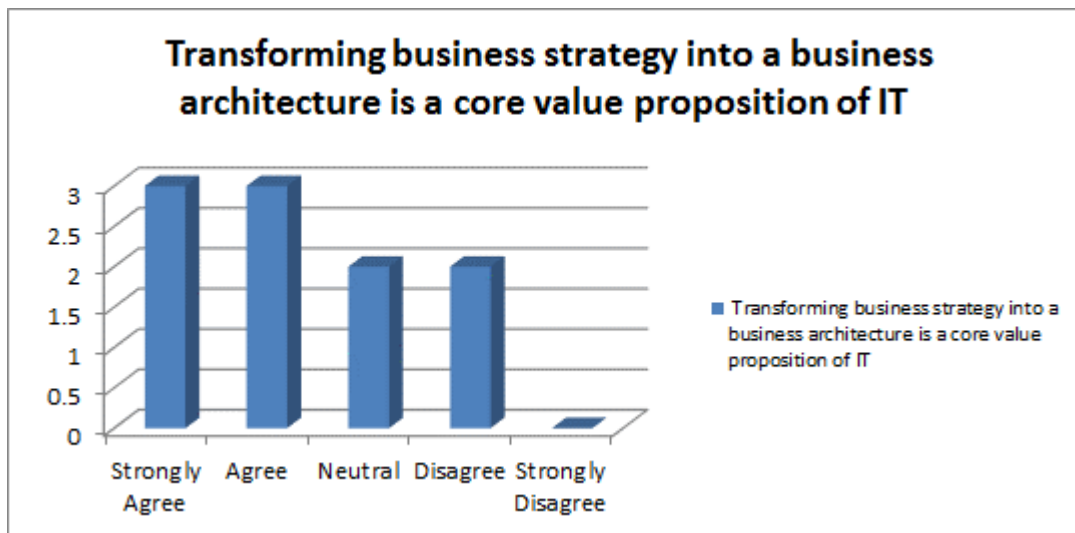
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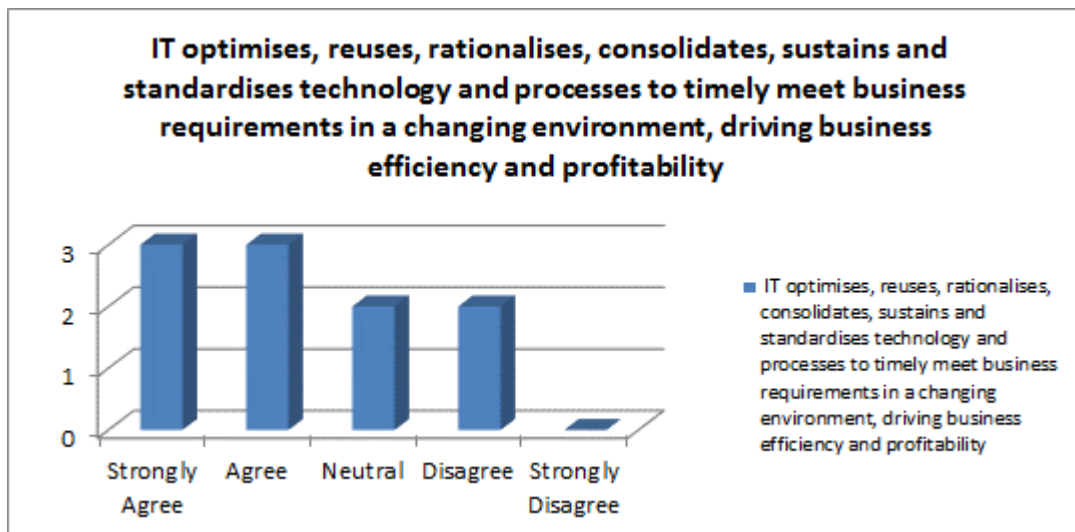
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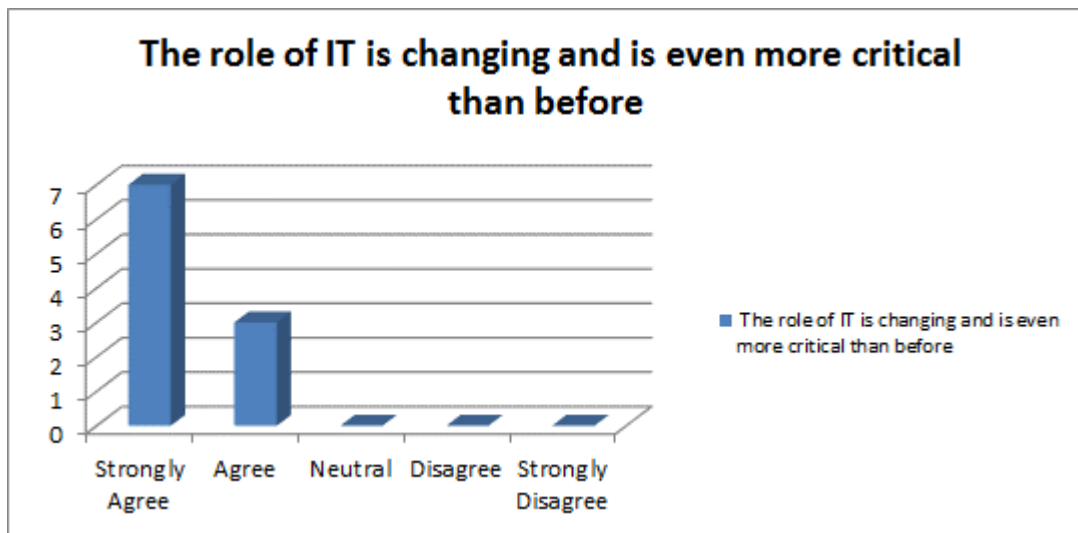
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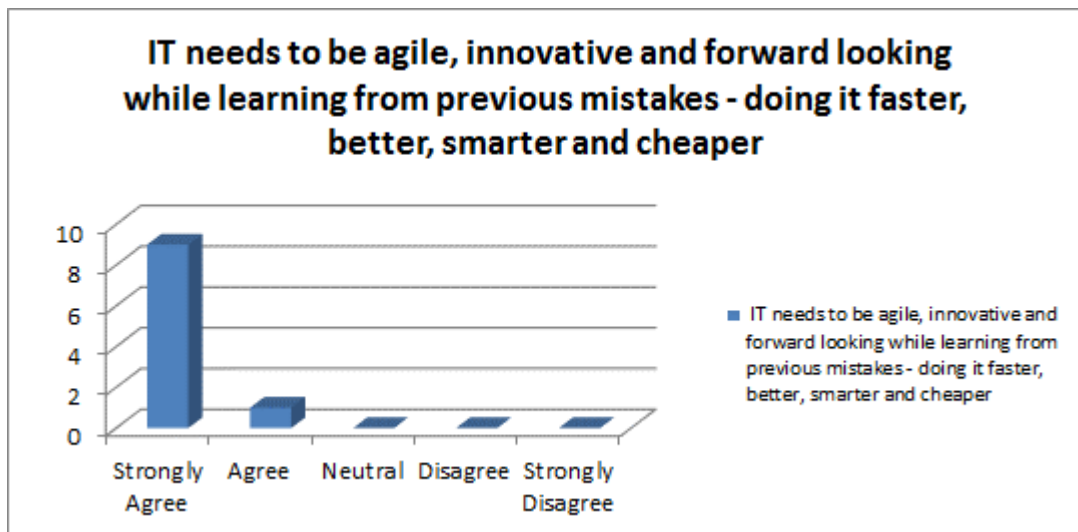
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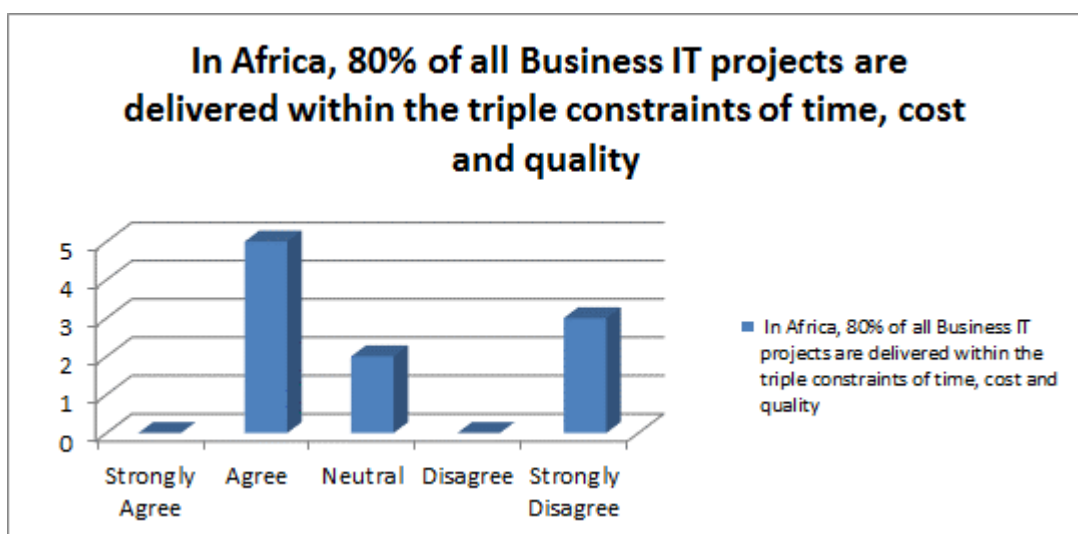
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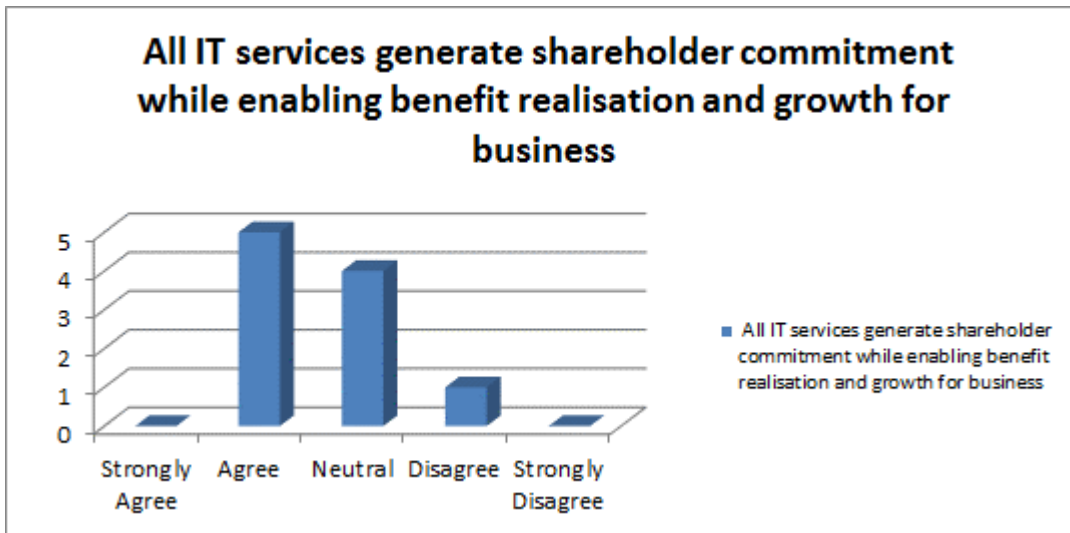
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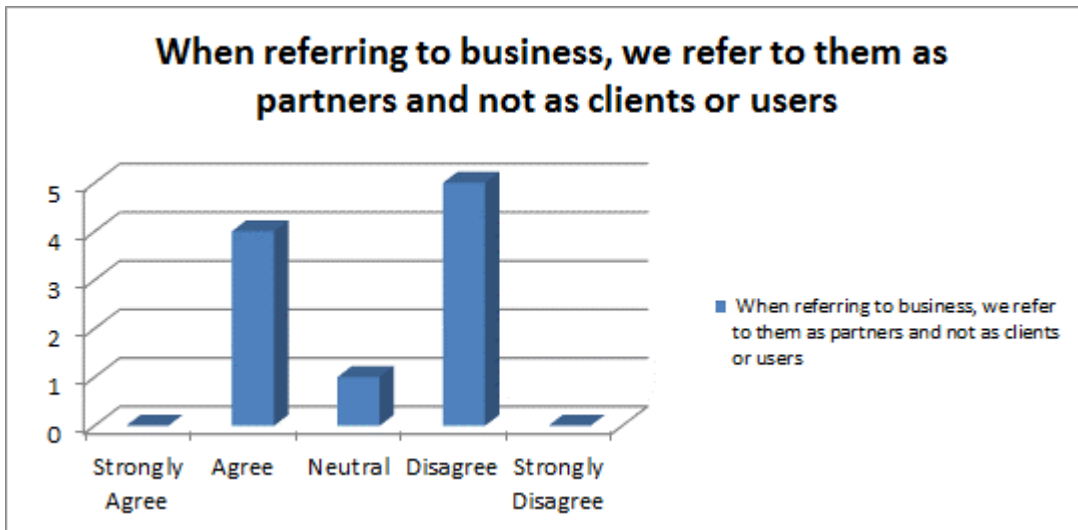
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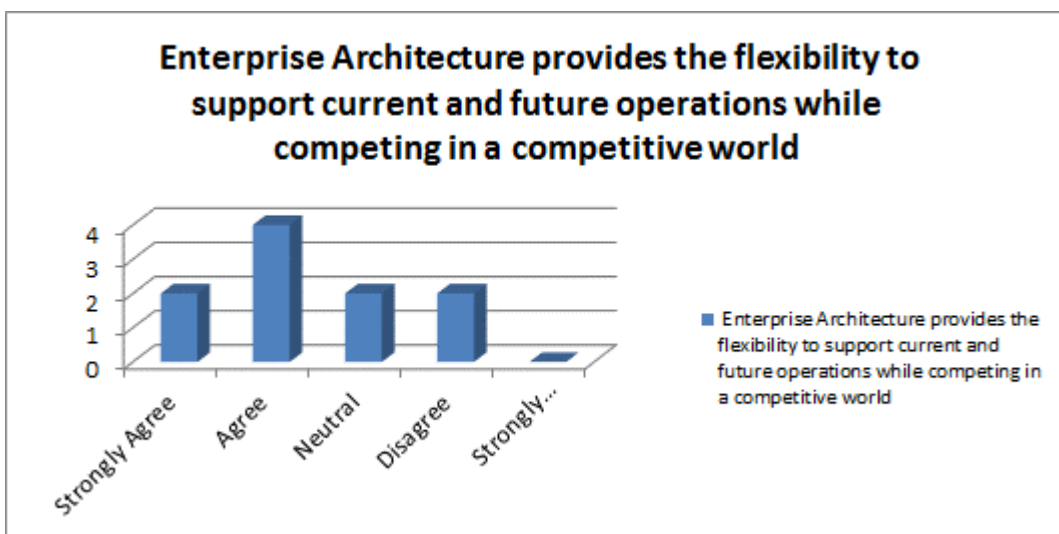
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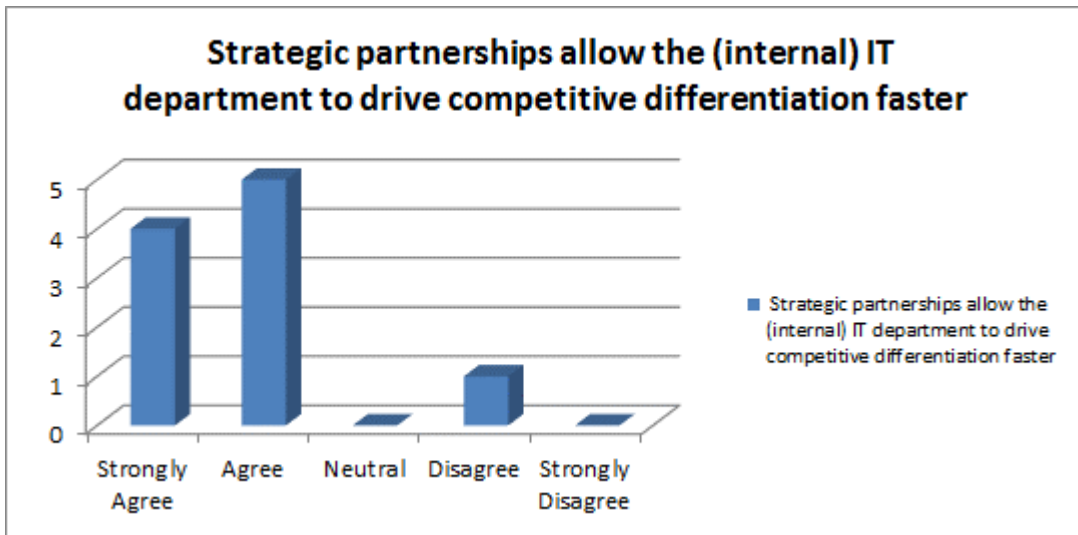
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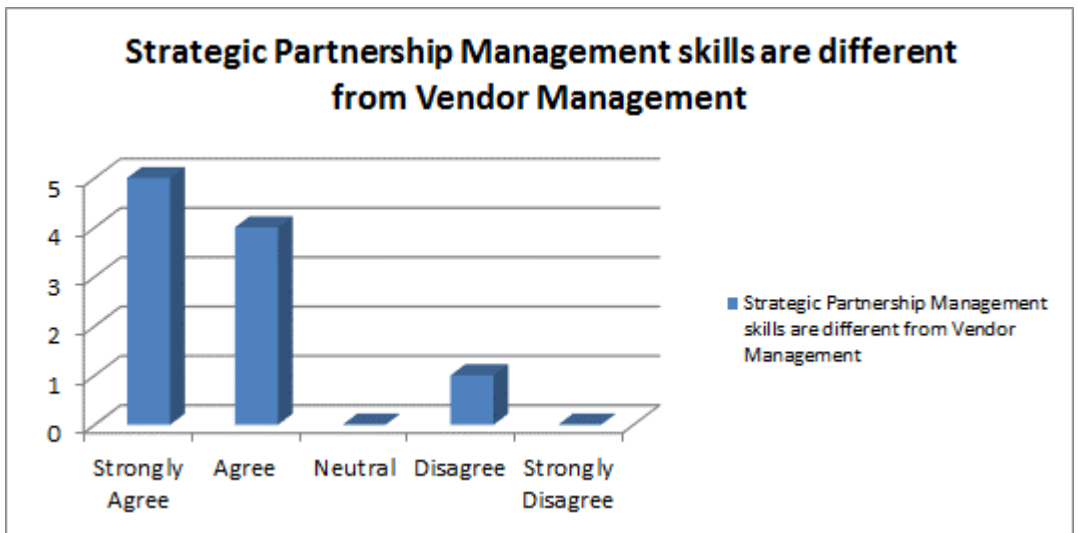
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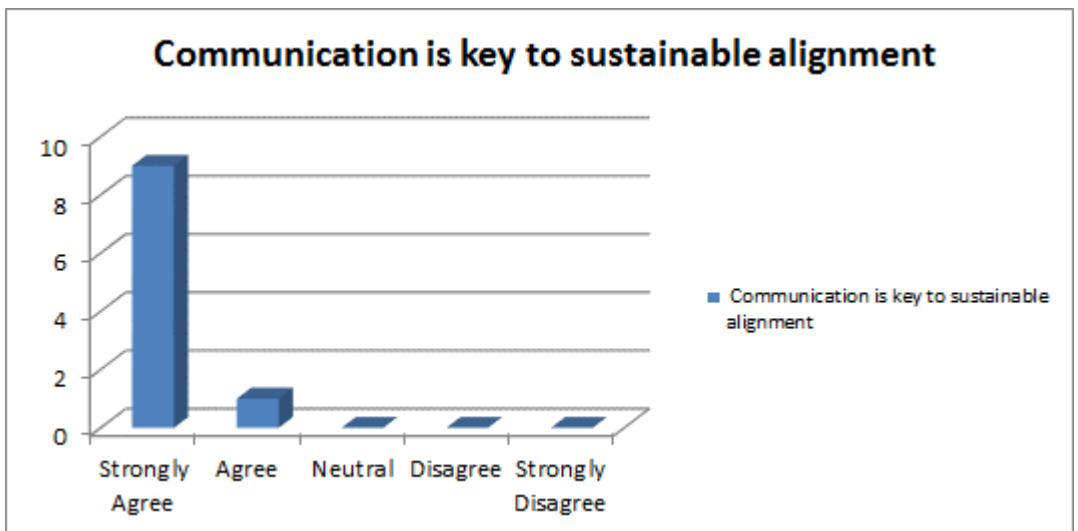
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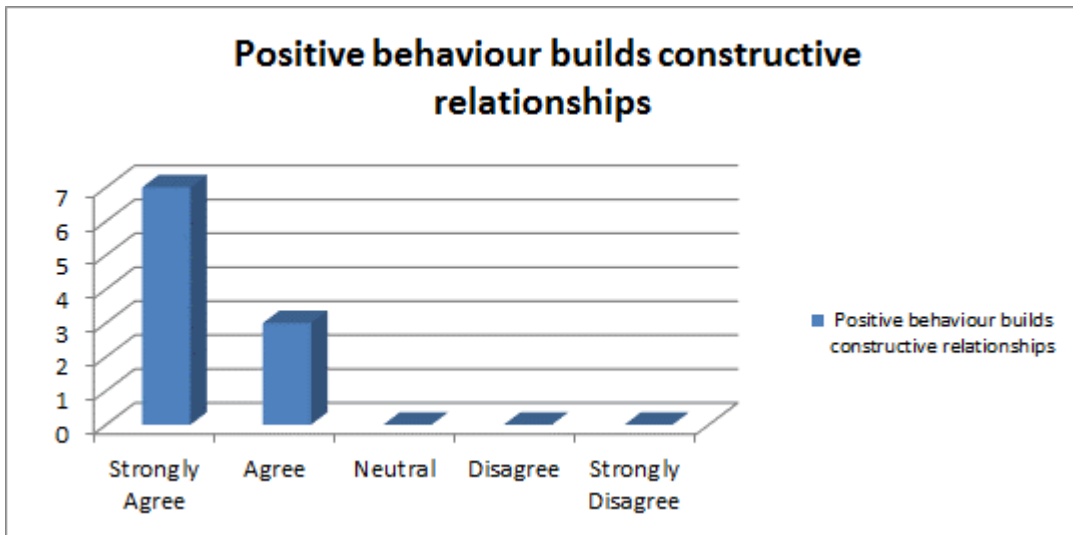
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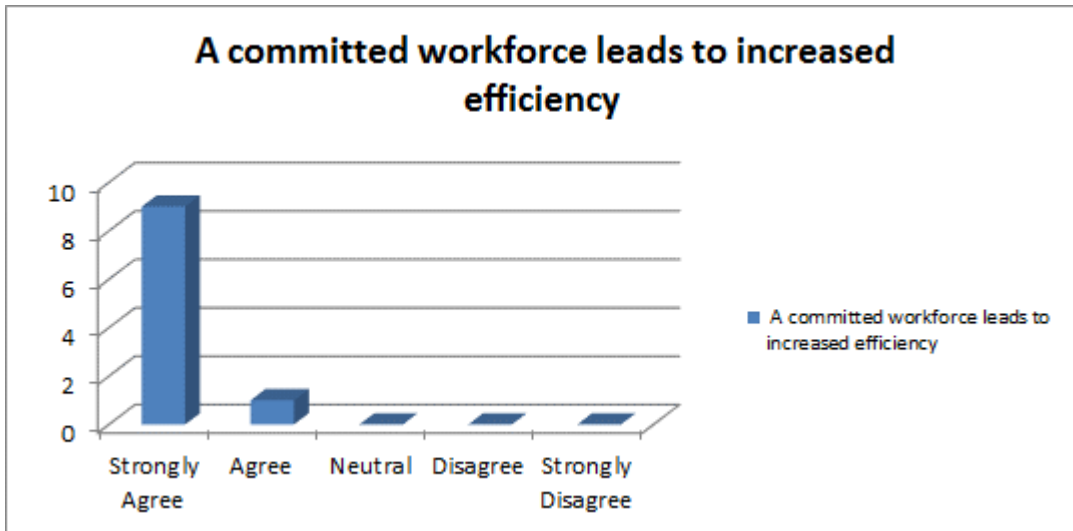
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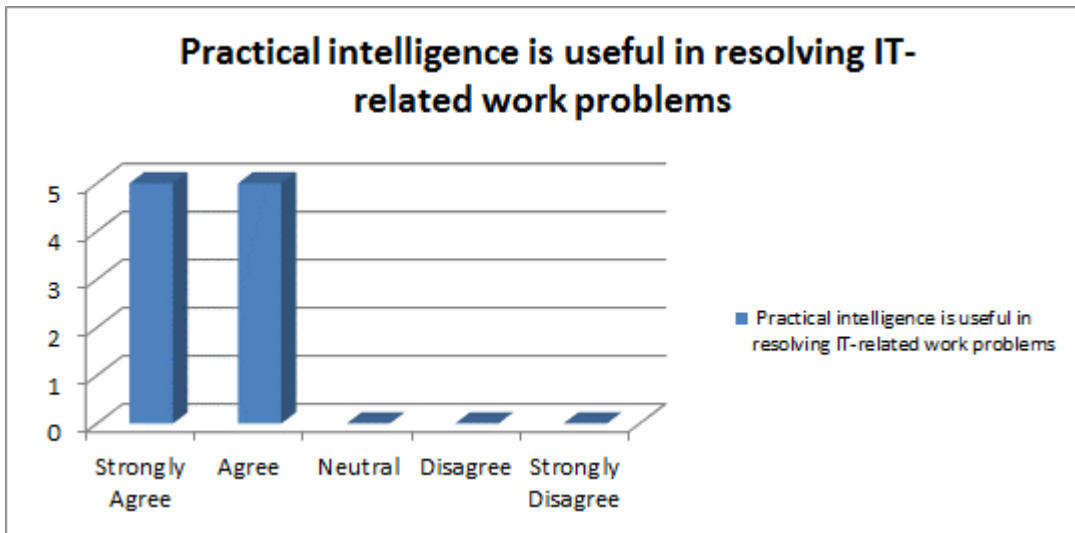
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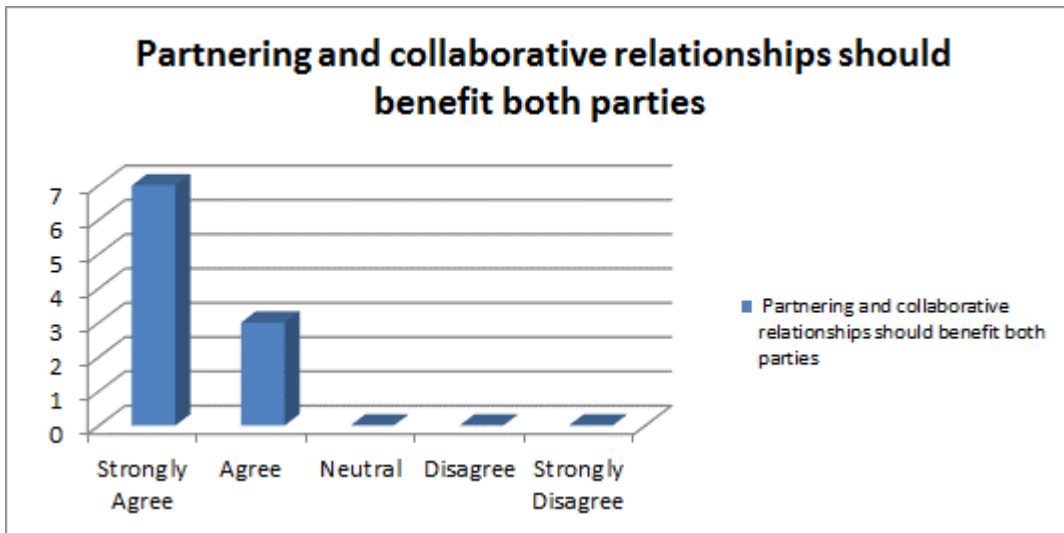
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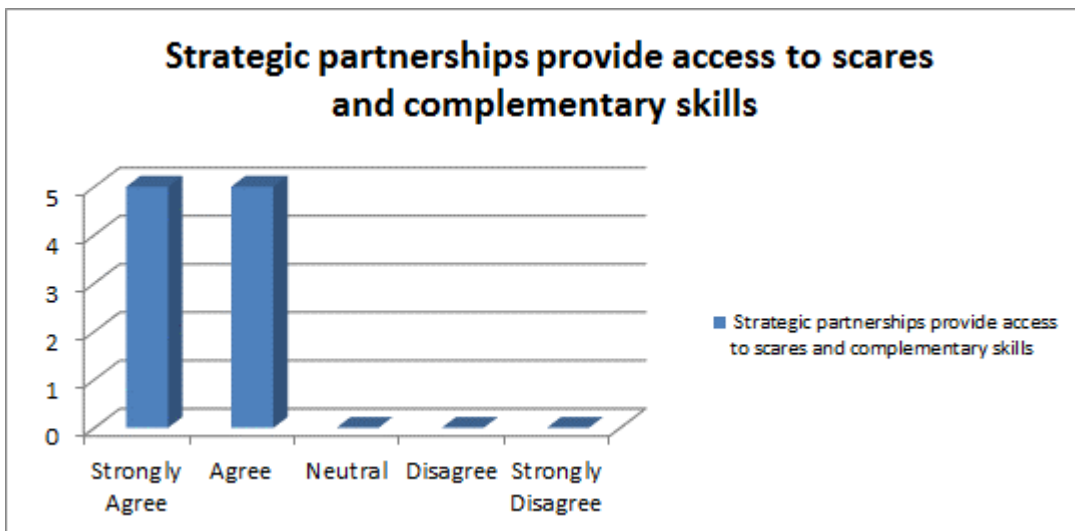
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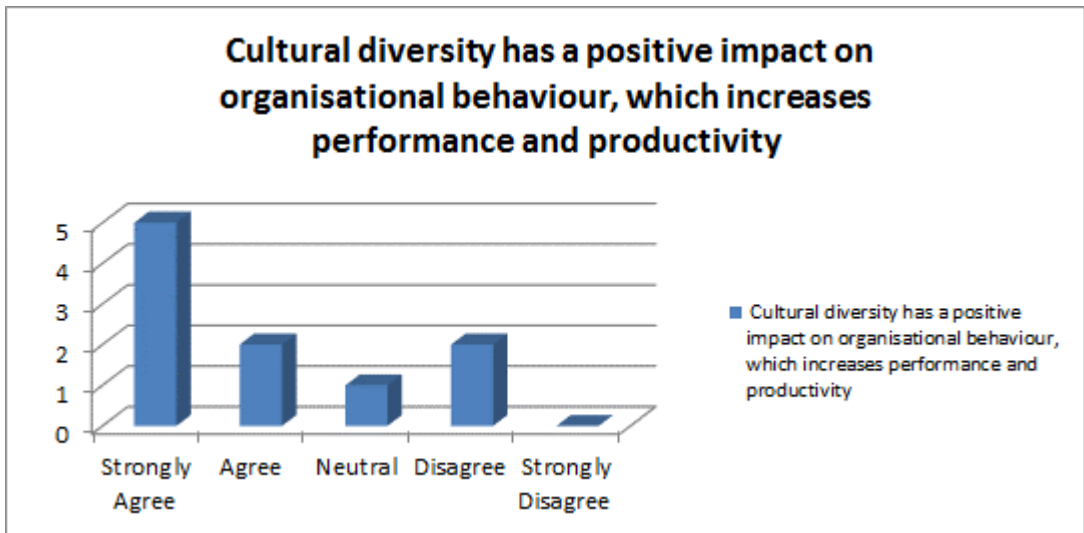
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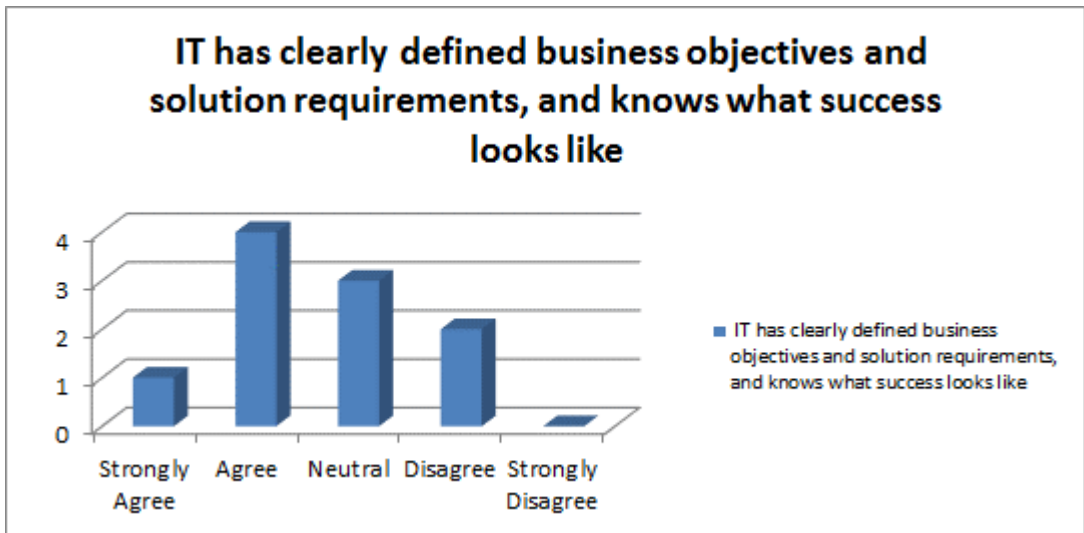
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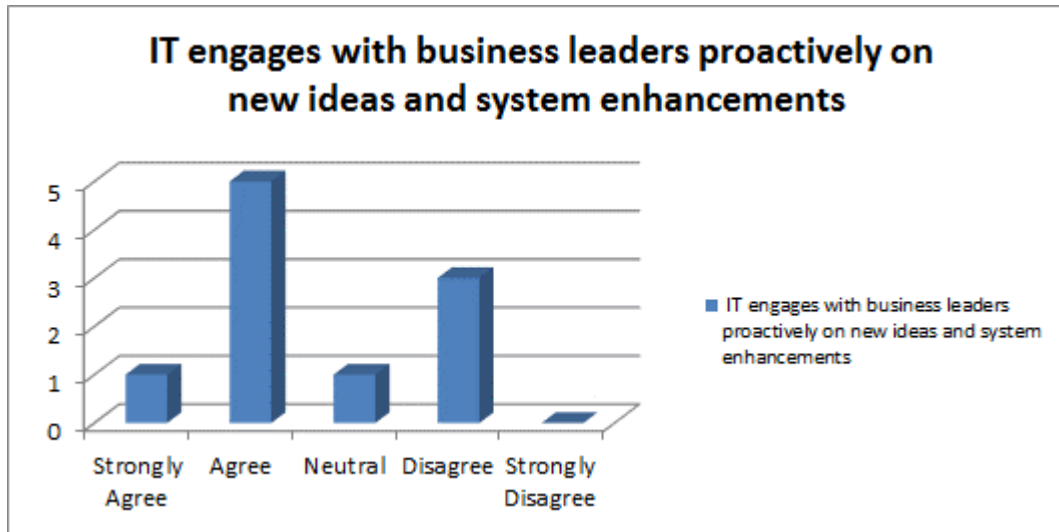


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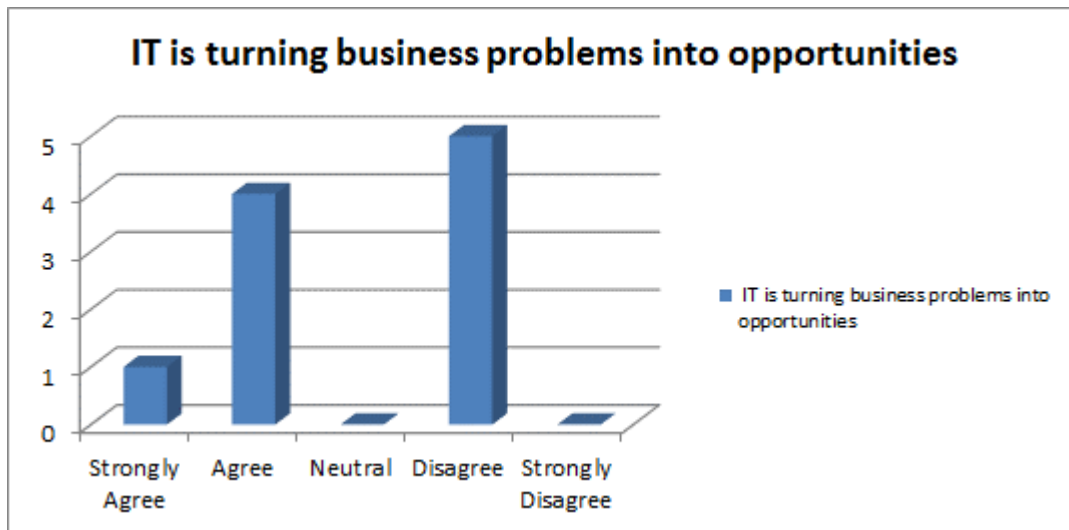


Appendix J: External Service Provider Results (Stage I)

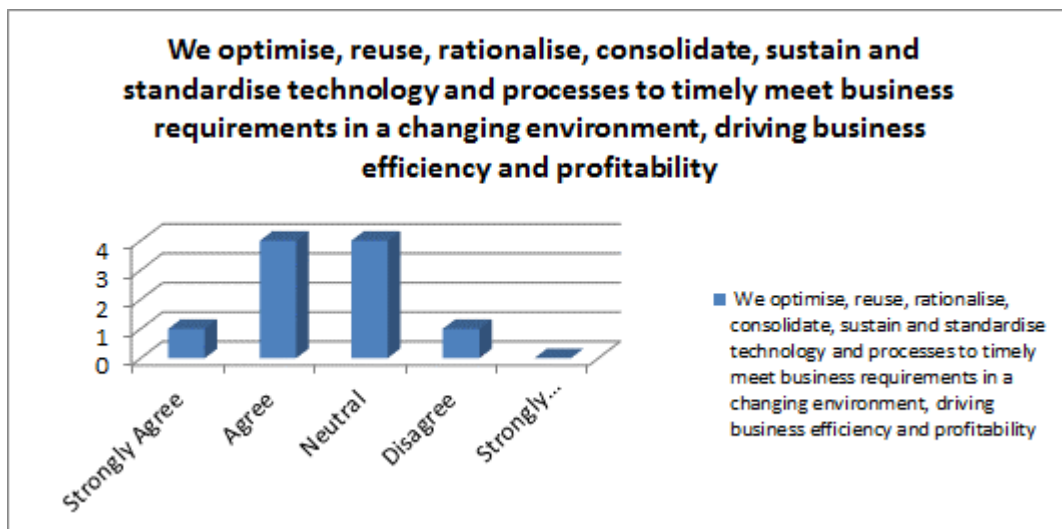
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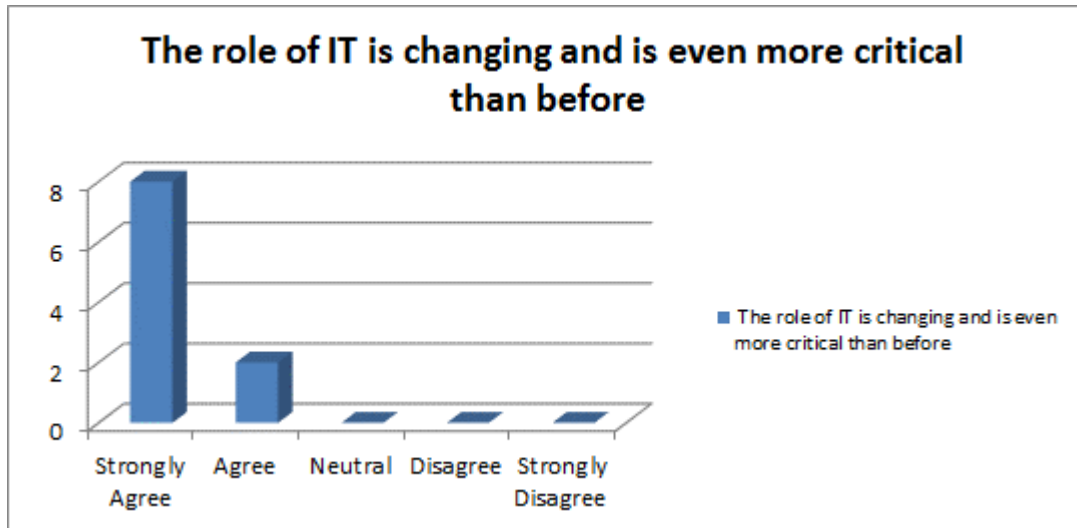
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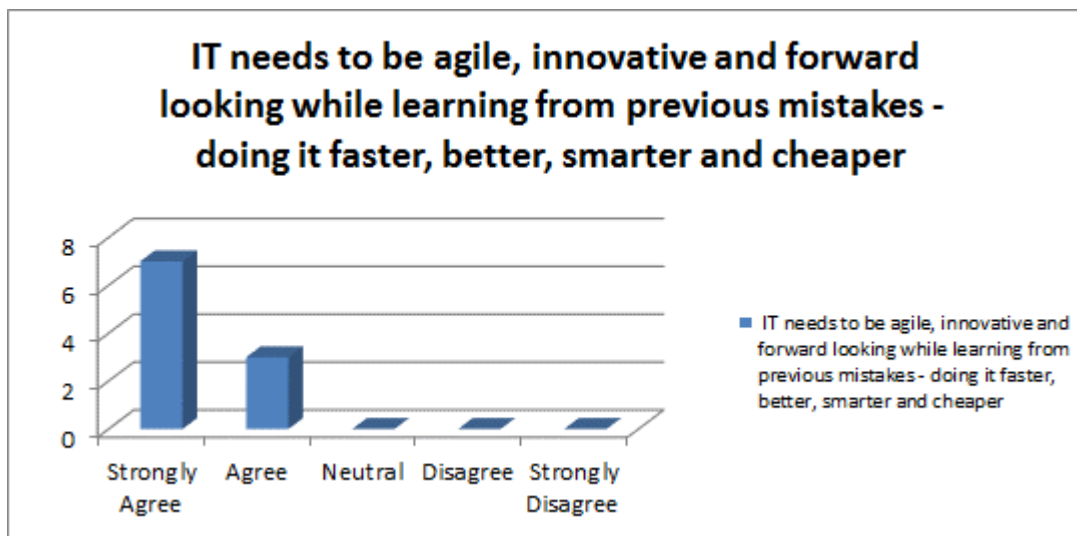
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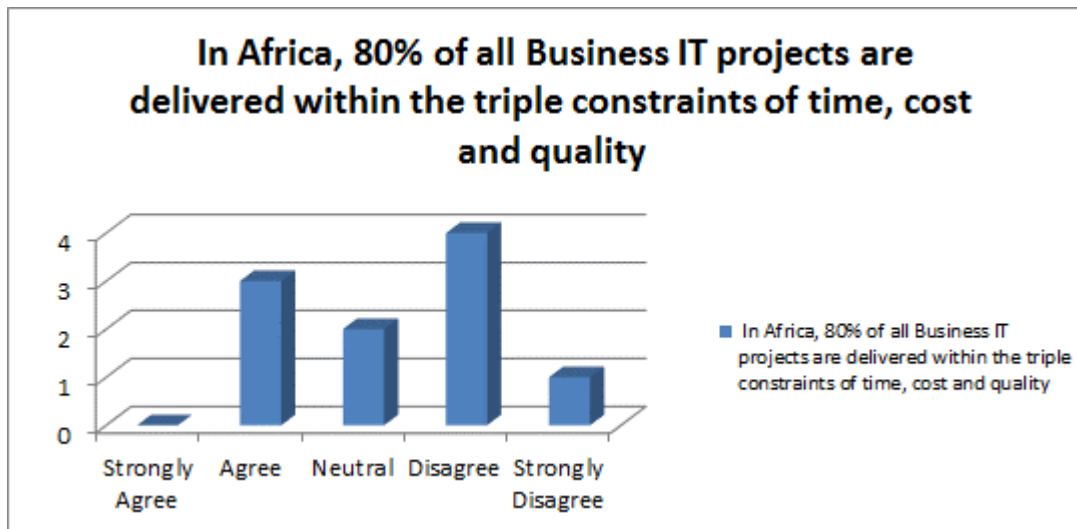
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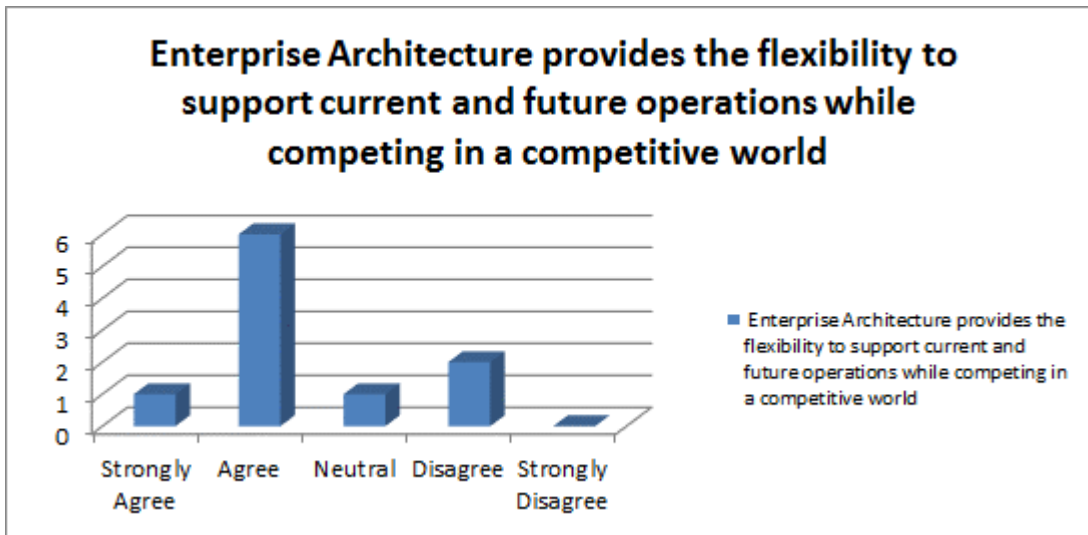
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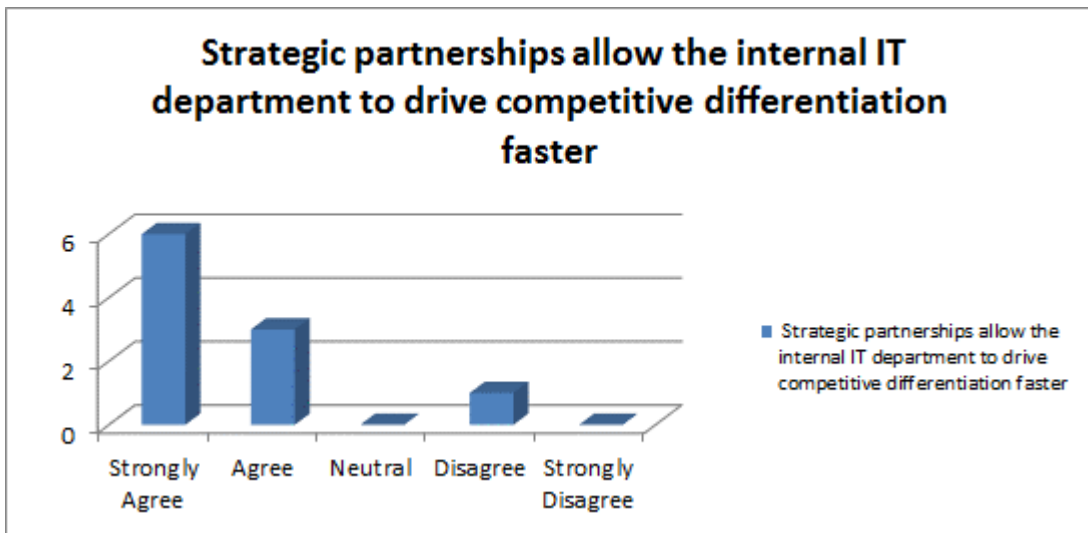
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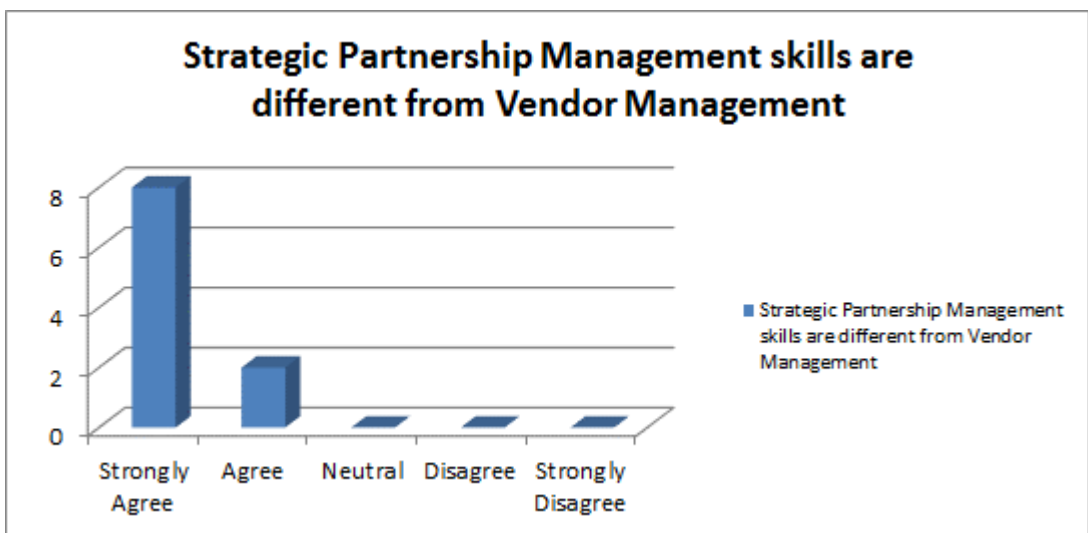
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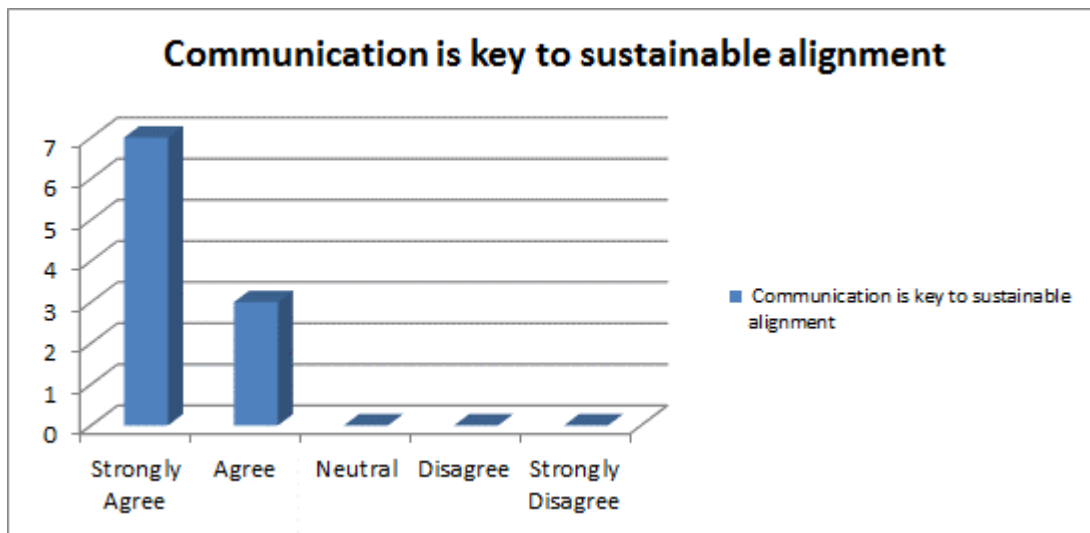
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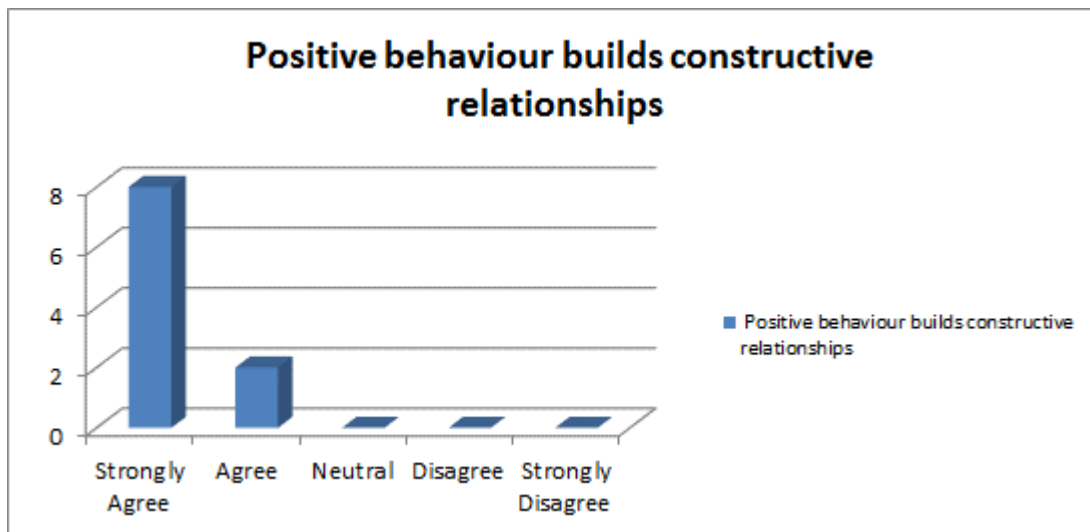
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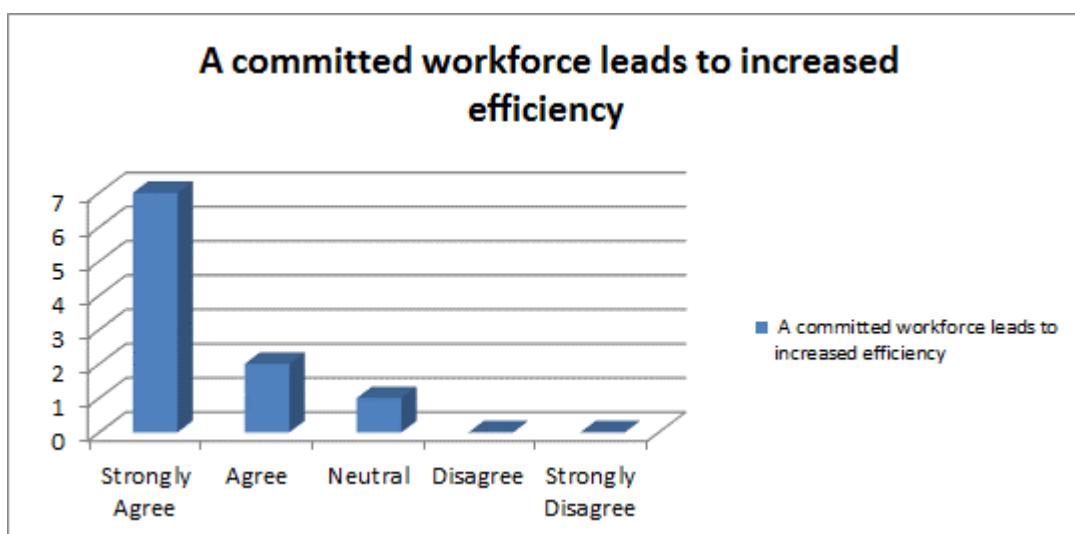
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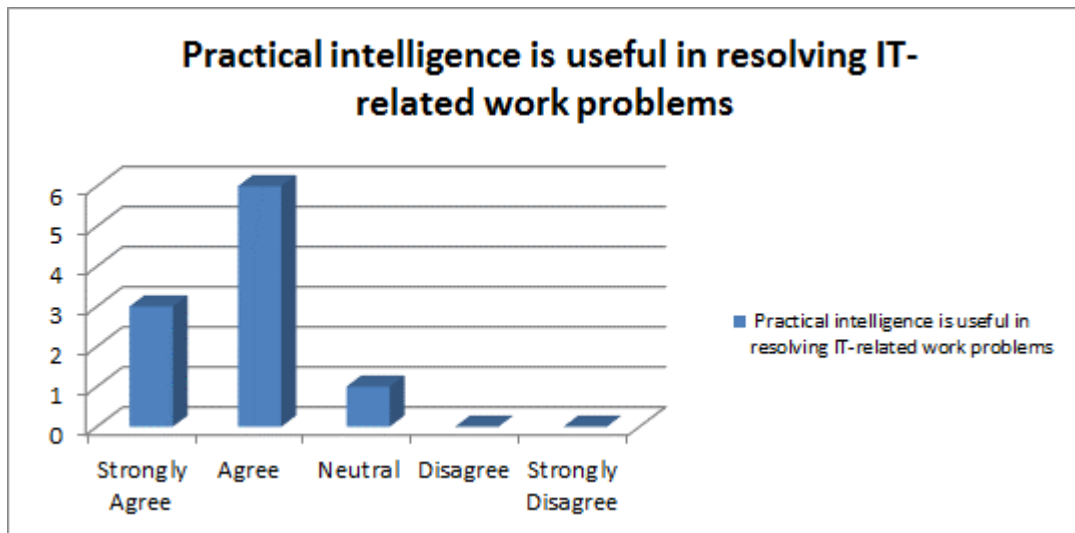
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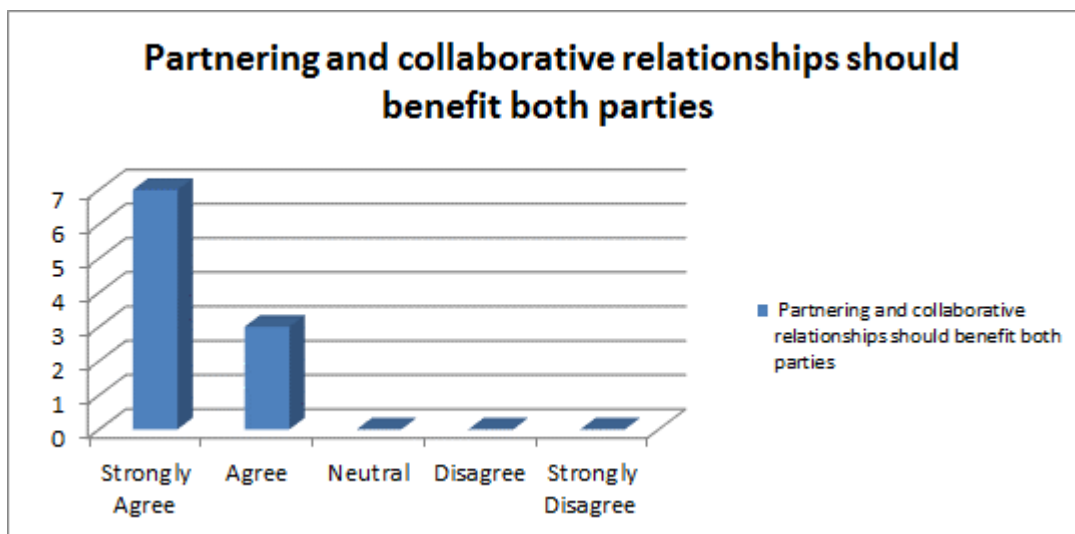
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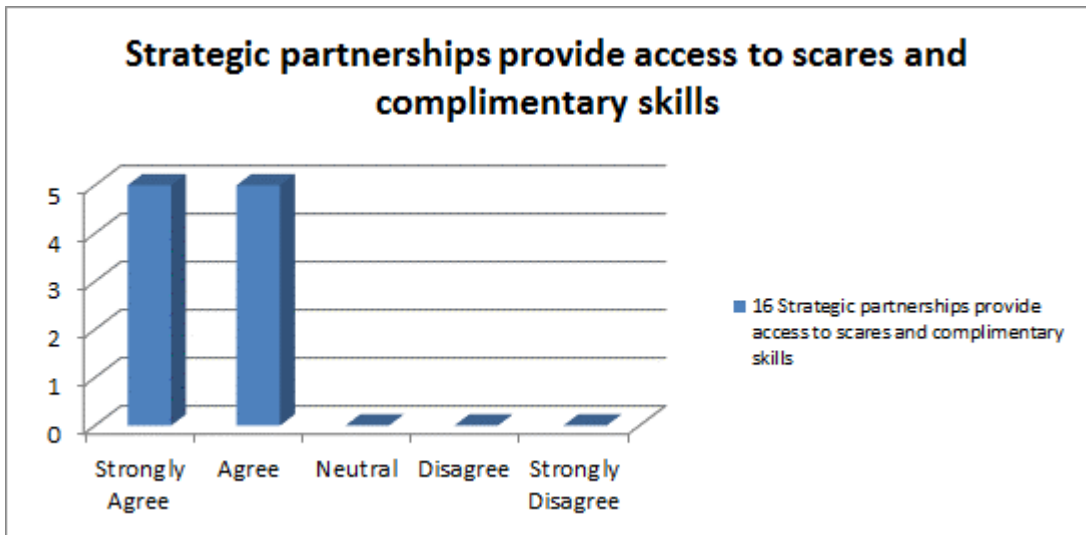
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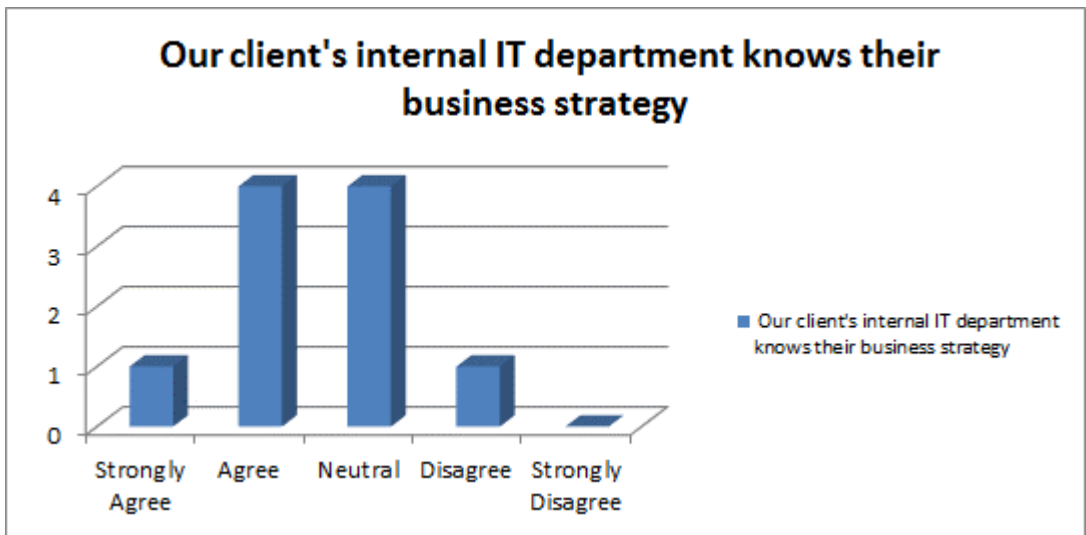
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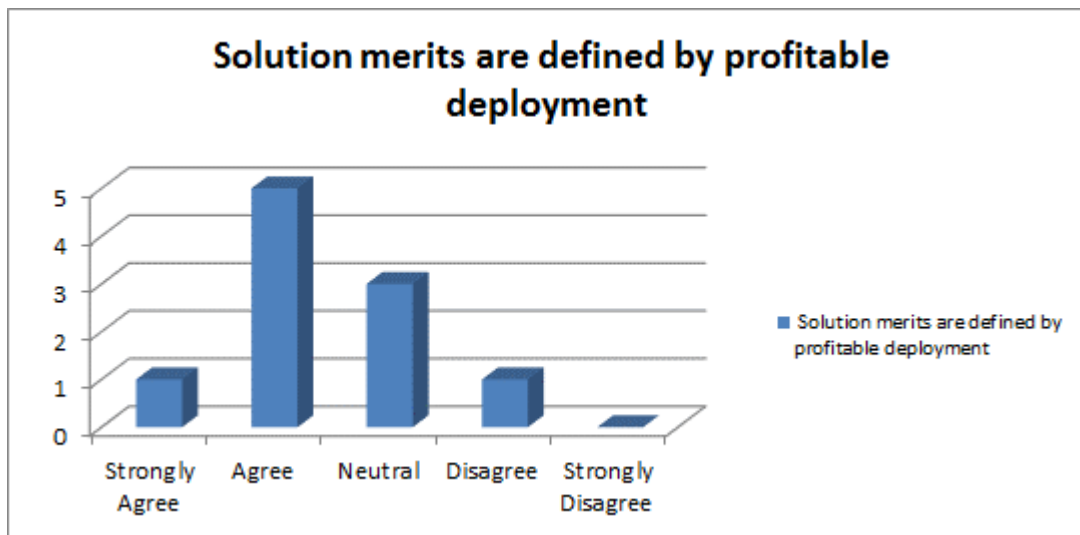
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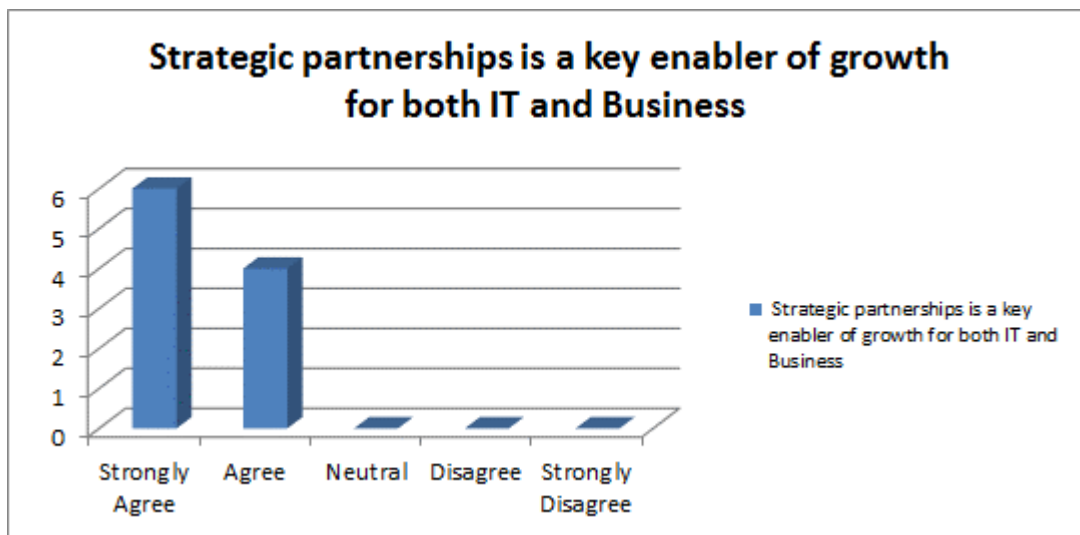
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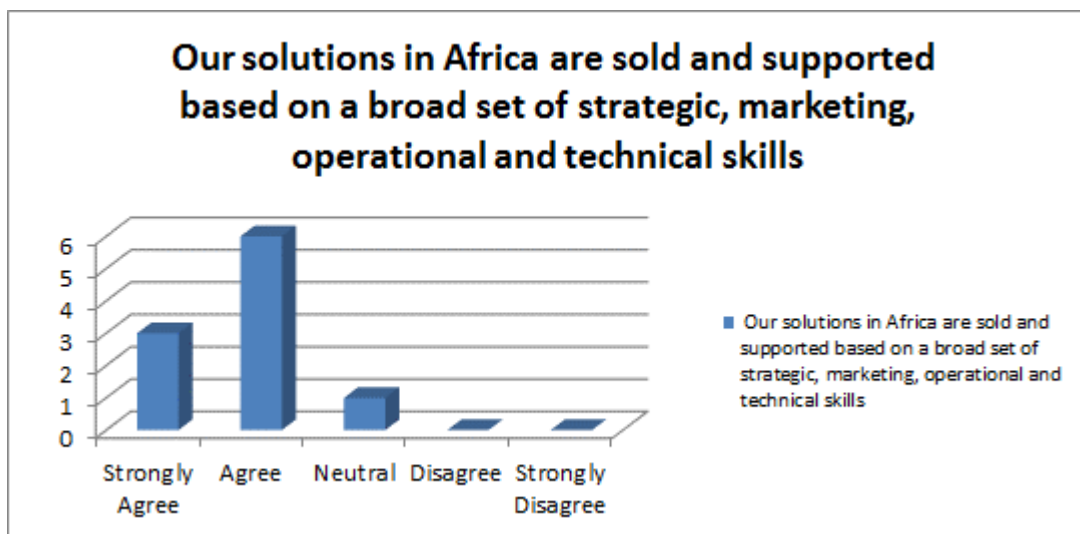
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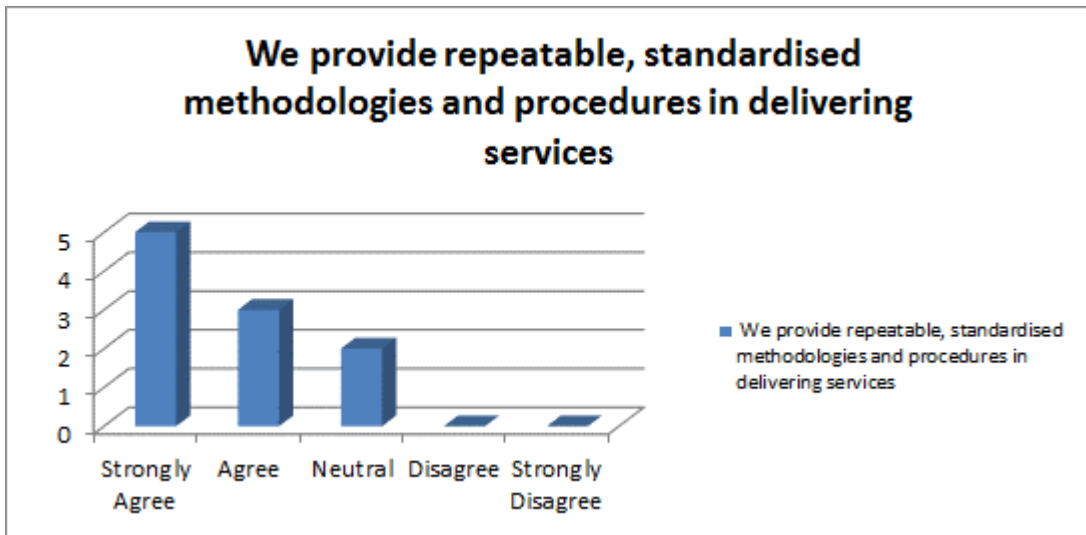
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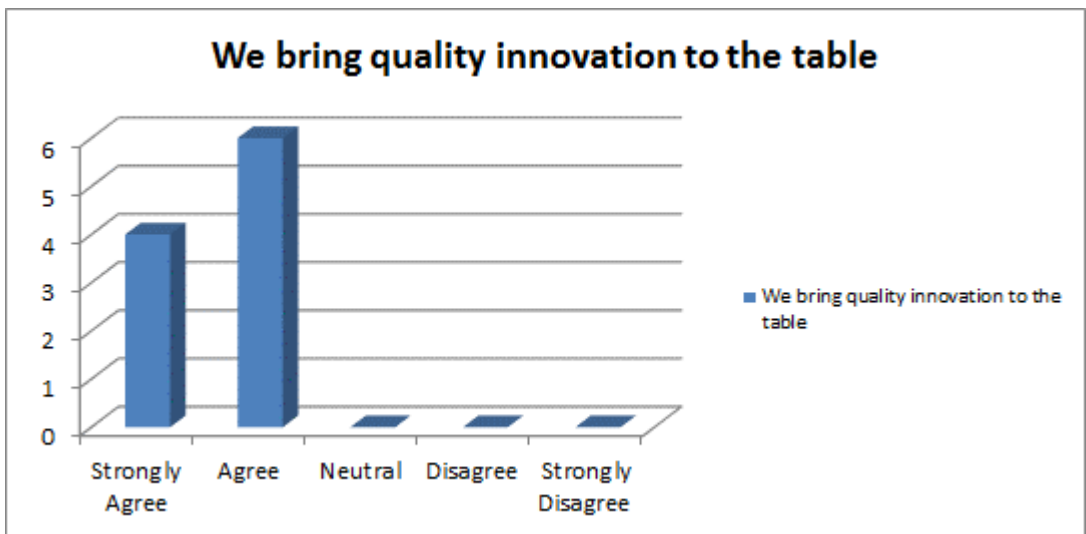
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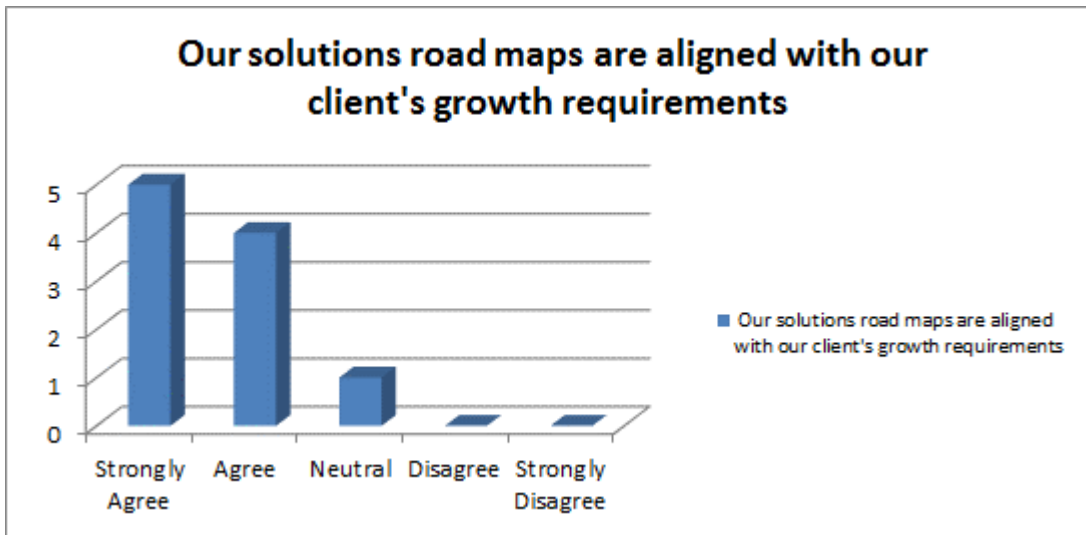
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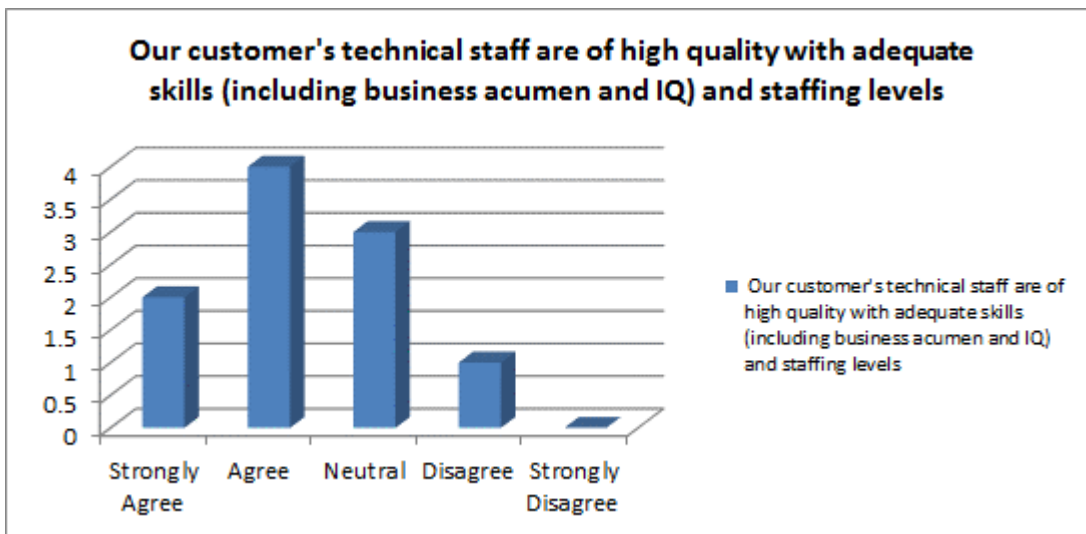
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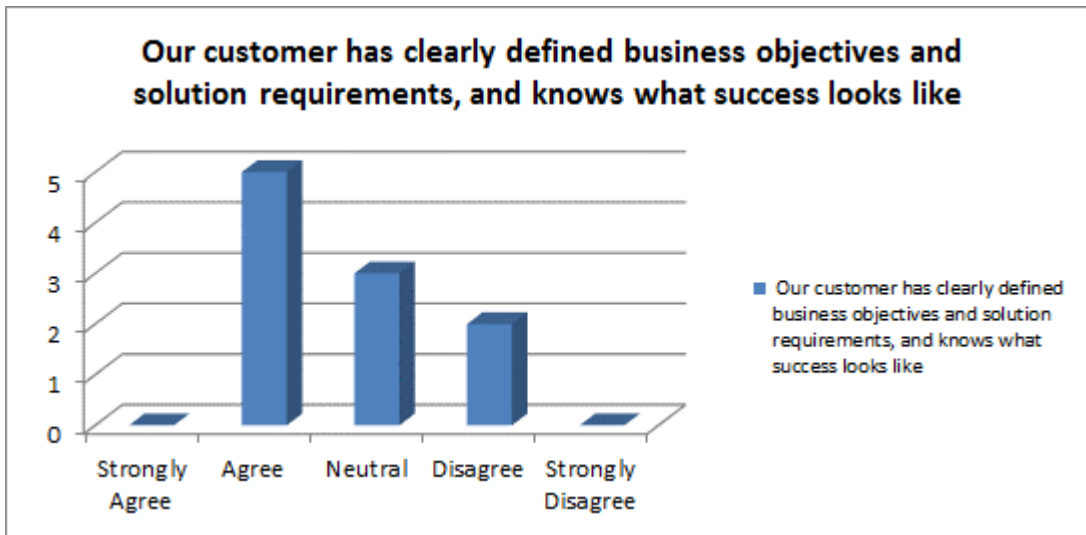
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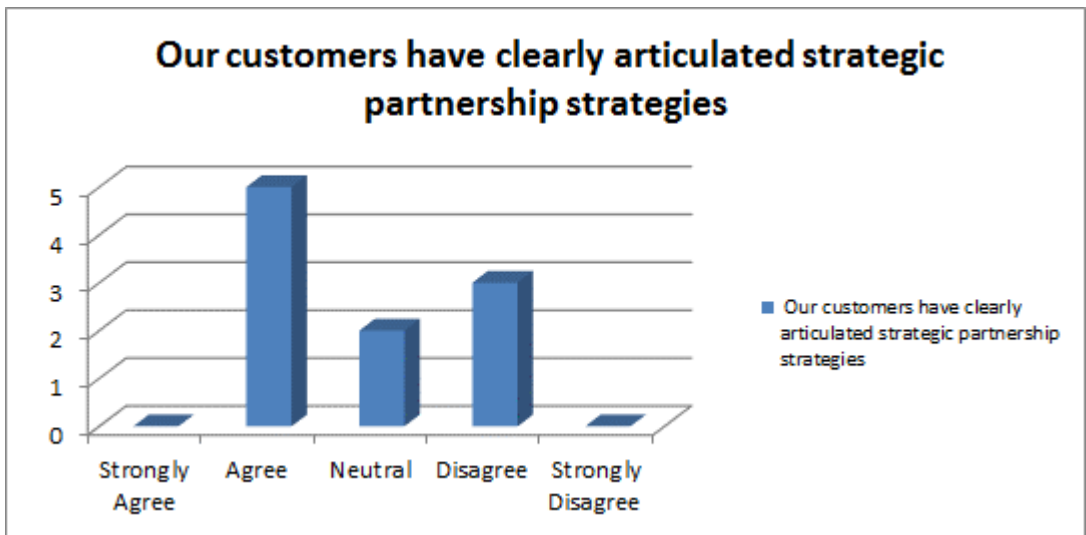
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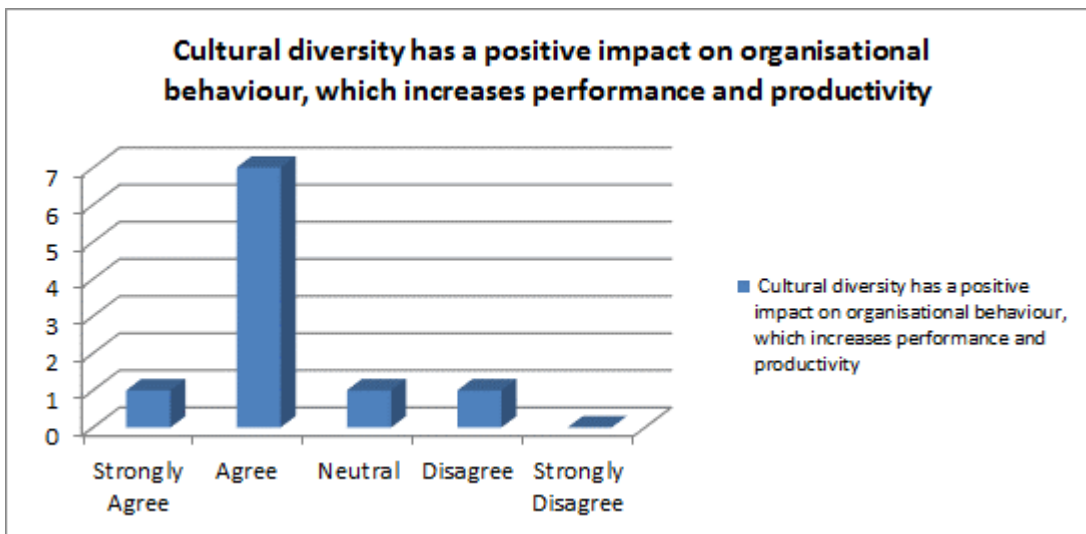
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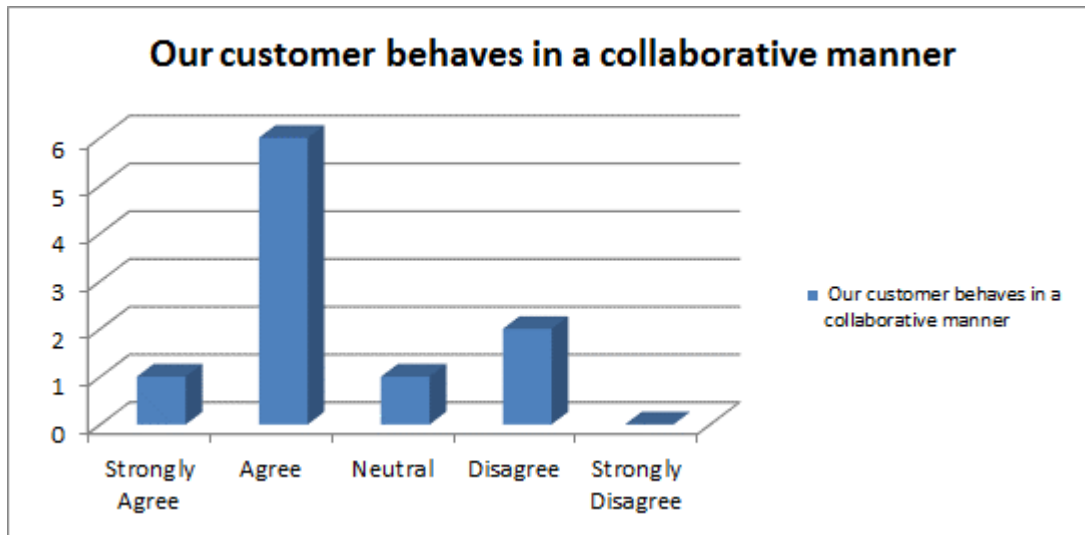


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Appendix K: Stage I – Combined Results

No.	Statement	UNIT OF ANALYSIS			
		C-level	CIO	ESP	Avg.
1	IT delivers a secure and reliable service	0.60			0.60
2	IT engages with business leaders proactively on new ideas and system enhancements	0.31	0.34	0.26	0.30
3	As an enabler of business, IT participates in business strategy formulation	0.02	-0.02		0.00
4	IT delivers solutions that enable organisational growth and transformation	0.49			0.49
5	The use of IT (such as mobility, big data management, business intelligence, etc.) accelerates organisational performance	0.58			0.58
6	IT participates in the engineering and continuous improvement of business processes	0.44			0.44
7	IT is an enabler of the organisational vision	0.55			0.55
8	IT personnel have the business acumen to serve our organisation	0.00			0.00
9	IT plays a facilitators role in organisational change	0.00			0.00
10	IT provides timely, relevant and the right data to decision makers	0.35			0.35
11	Knowledge Management assists with the development of new products and services	0.42			0.42
12	IT contributes to the bottom line of our organisation	0.36			0.36
13	The IT structure services the needs of our organisation	0.16			0.16
14	IT provides the platform to reach our customers and service partners	0.53			0.53
15	IT is turning business problems into opportunities	0.22	0.26	0.04	0.17
16	IT is an integral part of our business	0.44	0.38		0.41
17	Strategic partnerships is a key growth area for business over the next 5 years	0.69	0.86		0.78
18	Our organisation has a dashboard that shows employees how they perform and contribute to the achievement of the organisational goals and objectives	0.07			0.07
19	CIOs and IT Management need to have domain knowledge of their company	0.69	0.92		0.81
20	When recruiting, we are looking for technical resources with a sound knowledge (acumen) of the operations of our organisation		0.34		0.34
21	Emotional Intelligence is an important element of our recruitment and selection process		0.54		0.54
22	We deliver products, services and processes that create value for our organisation		0.60		0.60
23	Our staff contribute more to the organisation's objectives if they are treated as responsible and valuable employees		0.64		0.64

No.	Statement	UNIT OF ANALYSIS			
		C-level	CIO	ESP	Avg.
24	We communicate authentically with the business on all projects, incidents, problems and changes		0.40		0.40
25	Our solutions are simple to use and draw on the same data sources across the enterprise		0.10		0.10
26	IT has a clearly articulated partnership strategy		0.50		0.50
27	Coaches are assigned to employees at all levels in the organisation to drive transformation of people, processes and technology		-0.26		-0.26
28	Innovation is the deployment of industry practices as a new process to our organisation		-0.12		-0.12
29	Transforming business strategy into business architecture is a value proposition of IT		0.44		0.44
30	IT (we) optimises, reuses, rationalises, consolidates, sustains and standardises technology and processes to timely meet business requirements in a changing environment, driving business efficiency and profitability		0.44	0.44	0.44
31	IT innovation enables our organisation to stay ahead of our competitors		0.20		0.20
32	The role of IT is changing and is even more critical than before	0.87	0.88	0.92	0.89
33	IT needs to be agile, innovative and forward looking while learning from previous mistakes—doing it faster, better, smarter and cheaper	0.91	0.96	0.88	0.92
34	In Africa, 80% of all Business IT projects are delivered within the triple constraints of time, cost and quality	0.15	0.08	-0.08	0.05
35	All IT services generate shareholder commitment while enabling benefit realisation and growth for business		0.40		0.40
36	When referring to business, we refer to them as partners and not as clients or users		-0.02		-0.02
37	Enterprise Architecture provides the flexibility to support current and future operations while competing in a competitive world	0.47	0.40	0.38	0.42
38	Strategic partnerships allow the (internal) IT department to drive competitive differentiation faster		0.64	0.72	0.68
39	Strategic Partnership Management skills are different from Vendor Management		0.68	0.92	0.80
40	Communication is key to sustainable alignment	0.78	0.96	0.88	0.87
41	Positive behaviour builds constructive relationships	0.84	0.88	0.92	0.88
42	A committed workforce leads to increased efficiency	0.73	0.96	0.86	0.85
43	High emotional intelligence leads to better conflict resolution in the workplace	0.70	0.92	0.72	0.78
44	Practical intelligence is useful in resolving IT-related work problems		0.80	0.70	0.75
45	Partnering and collaborative relationships should benefit both parties		0.88	0.88	0.88

No.	Statement	UNIT OF ANALYSIS			
		C-level	CIO	ESP	Avg.
46	Strategic partnerships provide access to scares and complementary skills		0.80	0.80	0.80
47	Our client's internal IT department knows their business strategy			0.44	0.44
48	We deliver products, services, solutions and processes that create value for our customers			0.66	0.66
49	Solution merits are defined by profitable deployment			0.46	0.46
50	Strategic partnerships is a key enabler of growth for both IT and Business			0.84	0.84
51	Our solutions in Africa are sold and supported based on a broad set of strategic, marketing, operational and technical skills			0.70	0.70
52	We provide repeatable, standardised methodologies and procedures in delivering services			0.76	0.76
53	We ensure that our customer maximises the use of our products			0.52	0.52
54	We bring quality innovation to the table			0.76	0.76
55	Our solutions road maps are aligned with our client's growth requirements			0.78	0.78
56	Our customer provides us with opportunities to participate in new initiatives			0.66	0.66
57	Our customer's technical staff are of high quality with adequate skills (including business acumen and IQ) and staffing levels			0.50	0.50
58	Our customer has clearly defined business objectives and solution requirements, and knows what success looks like		0.34	0.30	0.32
59	Our customers have clearly articulated strategic partnership strategies			0.20	0.20
60	Our customer behaves in a collaborative manner			0.38	0.38
61	Cultural diversity has a positive impact on organisational behaviour, which increases performance and productivity	0.62	0.54	0.50	0.55
Number of questions per Unit of Analysis:		28	35	31	

LEDGENDS:

	Adequate and Effective. SCORE: 1 - 0.50. Number of QUESTIONS - 31 or 50.82%.
	Material Opportunity for Improvement. SCORE: 0.49 - 0.01. Number of QUESTIONS - 24 or 39.34%.
	Pervasive Material Weakness. SCORE: 0 - (-1). Number of QUESTIONS - 6 or 9.84%.

31 questions (50.82%) are deemed **adequate and effective** by the participants. The responses are grouped into the key focus areas as discussed in section 3.9.

Table: Questions deemed 'adequate' and 'effective' by participants

No.	Statement	UNIT OF ANALYSIS				THEMES												
		C-Level	CIO/ISM	ESP	Avg.	TRADITIONAL MANAGEMENT THEORY				PEOPLE				Agile				
						Planning	Organising	Directing	Controlling	IQ	B	Practical Intelligence	Partnering	EA	BT Alignment	Innovation		
1	IT delivers a secure and reliable service	0.60			0.60	X	X	X	X									
5	The use of IT (such as mobility; big data management; business intelligence; etc.) accelerates organisational performance	0.58			0.58										X			
7	IT is an enabler of the organisational vision	0.55			0.55											X		
14	IT provides the platform to reach our customers and service partners	0.53			0.53										X			
17	Strategic partnerships is a key growth area for business over the next 5 years	0.69	0.86		0.78								X					
19	CIOs and IT Management need to have domain knowledge of their company	0.69	0.92		0.81					X		X						
21	Emotional intelligence is an important element of our recruitment and selection process		0.54		0.54						X							
22	We deliver products, services and processes that create value for our organisation		0.60		0.60										X			
23	Our staff contribute more to the organisation's objectives if they are treated as responsible and valuable employees		0.64		0.64						X							
26	IT has a clearly articulated partnership strategy		0.50		0.50								X					
32	The role of IT is changing and is even more critical than before.	0.87	0.88	0.92	0.89	X	X	X	X							X		
33	IT needs to be agile, innovative and forward looking while learning from previous mistakes - doing it faster, better, smarter and cheaper	0.91	0.96	0.88	0.92										X	X	X	
38	Strategic partnerships allow the (internal) IT department to drive competitive differentiation faster		0.64	0.72	0.68									X				
39	Strategic Partnership Management skills are different from Vendor Management		0.68	0.92	0.80									X				
40	Communication is key to sustainable alignment	0.78	0.96	0.88	0.87						X							
41	Positive behaviour builds constructive relationships	0.84	0.88	0.92	0.88						X							
42	A committed workforce leads to increased efficiency	0.73	0.96	0.86	0.85						X							
43	High emotional intelligence leads to better conflict resolution in the workplace	0.70	0.92	0.72	0.78						X							
44	Practical intelligence is useful in resolving IT-related work problems		0.80	0.70	0.75							X						
45	Partnering and collaborative relationships should benefit both parties		0.88	0.88	0.88								X					
46	Strategic partnerships provide access to scarce and complementary skills		0.80	0.80	0.80									X				
48	We deliver products, services, solutions and processes that creates value for our customers			0.66	0.66											X		
50	Strategic partnerships is a key enabler of growth for both IT and Business			0.84	0.84									X				
51	Our solutions in Africa are sold and supported based on a broad set of strategic, marketing, operational and technical skills			0.70	0.70											X		
52	We provide repeatable, standardised methodologies and procedures in delivering services			0.76	0.76										X			
53	We ensures that our customer maximises the use of our products			0.52	0.52											X		
54	We bring quality innovation to the table			0.76	0.76												X	
55	Our solutions road maps are aligned with our client's growth requirements			0.78	0.78										X			
56	Our customer provides us with opportunities to participate in new initiatives			0.66	0.66								X					
57	Our customer's technical staff are of high quality with adequate skills (including business acumen and IQ) and staffing levels			0.50	0.50							X						
61	Cultural diversity has a positive impact on organisational behaviour, which increases performance and productivity	0.62	0.54	0.50	0.55						X							

Management Theory:

- i. IT delivers a secure and reliable service (Q.1 / Code: M-PI; M-Or; M-Di; M-Co);
- ii. The role of IT is changing and is even more critical than before (Q.32 / Code: M-PI; M-Or; M-Di; M-Co).

People:

- i. Strategic partnerships is a key growth area for business over the next 5 years (Q.17 / Code: P-Pa);
- ii. CIOs and IT Management need to have domain knowledge of their company (Q.19 / Code: P-IQ / P-Pi);
- iii. Emotional Intelligence is an important element of our recruitment and selection process (Q21 / Code: P-EI);
- iv. Our staff contribute more to the organisation's objectives if they are treated as responsible and valuable employees (Q23 / Code: P-EI);
- v. IT has a clearly articulated partnership strategy (Q.26 / Code: P-Pa);
- vi. Strategic partnerships allow the (internal) IT department to drive competitive differentiation faster (Q.38 / Code: P-Pa);
- vii. Strategic Partnership Management skills are different from Vendor Management (Q.39 / Code: P-Pa);
- viii. Communication is key to sustainable alignment (Q.40 / Code: P-EI);
- ix. Positive behaviour builds constructive relationships (Q.41 / Code: P-EI);
- x. A committed workforce leads to increased efficiency (Q.42 / Code: P-EI);
- xi. High emotional intelligence leads to better conflict resolution in the workplace (Q.43 / Code: P-EI);
- xii. Practical intelligence is useful in resolving IT-related work problems (Q.44 / Code: P-PI);
- xiii. Partnering and collaborative relationships should benefit both parties (Q.45 / Code: P-Pa);
- xiv. Strategic partnerships provide access to scares and complementary skills (Q.46 / Code: P-Pa);
- xv. Strategic partnerships is a key enabler of growth for both IT and Business (Q.50 / Code: P-Pa);

- xvi. Our customer provides us with opportunities to participate in new initiatives (Q.56 / Code: P-Pa);
- xvii. Our customer's technical staff are of high quality with adequate skills (including business acumen and IQ) and staffing levels (Q.57 / Code: P-PI);
- xviii. Cultural diversity has a positive impact on organisational behaviour, which increases performance and productivity (Q.61 / P-EI).

Agility:

- i. The use of IT (such as mobility, big data management, business intelligence; etc.) accelerates organisational performance (Q.5 / Code: A-EA);
- ii. IT is an enabler of the organisational vision (Q.7 / Code: A-AI);
- iii. IT provides the platform to reach our customers and service partners (Q.14 / Code: A-EA);
- iv. We deliver products, services and processes that create value for our organisation (Q.48 / Code: A-EA);
- v. IT needs to be agile, innovative and forward looking while learning from previous mistakes—doing it faster, better, smarter and cheaper (Q.33 / Code: A-EA; A-AI; A-In);
- vi. We deliver products, services, solutions and processes that create value for our customers (Q.48 / Code: A-AI);
- vii. Our solutions in Africa are sold and supported based on a broad set of strategic, marketing, operational and technical skills (Q.51 / Code: A-AI);
- viii. We provide repeatable, standardised methodologies and procedures in delivering services (Q.52 / Code: A-EA);
- ix. We ensure that our customer maximises the use of our products (Q.53 / Code: A-AI);
- x. We bring quality innovation to the table (Q.54 / Code: A-In);
- xi. Our solutions road maps are aligned with our client's growth requirements (Q.55 / Code: A-EA).

24 questions (39.34%) are deemed by the participants to have **material opportunities for improvements**. The responses are grouped into the key focus areas as discussed in section 3.9.

Table: Questions deemed to have ‘material opportunities for improvements’

No.	Statement	UNIT OF ANALYSIS				THEMES											
		C-Level	CIOISM	ESP	Avg.	TRADITIONAL MANAGEMENT THEORY				PEOPLE				Agile			
						Planning	Organising	Directing	Controlling	IQ	B	Practical Intelligence	Partnering	EA	BIT Alignment	Innovation	
2	IT engages with business leaders proactively on new ideas and system enhancements	0.31	0.34	0.26	0.30							x	X				
4	IT delivers solutions that enable organisational growth and transformation	0.49			0.49												X
6	IT participates in the engineering and continuous improvement of business processes	0.44			0.44										X		
10	IT provides timely, relevant and the right data to decision makers	0.35			0.35										X		
11	Knowledge Management assists with the development of new products and services	0.42			0.42										X	X	
12	IT contributes to the bottom line of our organisation	0.36			0.36	X	X	X	X								
13	The IT structure services the needs of our organisation	0.16			0.16											X	X
15	IT is turning business problems into opportunities	0.22	0.26	0.04	0.17										X		
16	IT is an integral part of our business	0.44	0.38		0.41											X	
18	Our organisation has a dashboard that shows employees how they perform and contribute to the achievement of the organisational goals and objectives	0.07			0.07											X	
20	When recruiting, we are looking for technical resources with a sound knowledge (acumen) of the operations of our organisation		0.34		0.34								X				
24	We communicate authentically with the business on all projects, incidents, problems and changes		0.40		0.40							X					
25	Our solutions are simple to use and draw on the same data sources across the enterprise		0.10		0.10										X		
29	Transforming business strategy into business architecture is a value proposition of IT		0.44		0.44										X		
30	IT (we) optimises, reuses, rationalises, consolidates, sustains and standardises technology and processes to timely meet business requirements in a changing environment, driving business efficiency and profitability		0.44	0.44	0.44										X		
31	IT innovation enables our organisation to stay ahead of our competitors		0.20		0.20												X
34	In Africa, 80% of all Business IT projects are delivered within the triple constraints of time, cost and quality	0.15	0.08	-0.08	0.05	x	x	x	x								
35	All IT services generate shareholder commitment while enabling benefit realisation and growth for business		0.40		0.40											X	
37	Enterprise Architecture provides the flexibility to support current and future operations while competing in a competitive world	0.47	0.40	0.38	0.42										X		
47	Our client's internal IT department knows their business strategy			0.44	0.44											X	
49	Solution merits are defined by profitable deployment			0.46	0.46	X	X	X	X								
58	Our customer has clearly defined business objectives and solution requirements, and knows what success looks like		0.34	0.30	0.32										X		
59	Our customers have clearly articulated strategic partnership strategies			0.20	0.20									X			
60	Our customer behaves in a collaborative manner			0.38	0.38							X					

Management Theory:

- i. IT contributes to the bottom line of our organisation (Q.12 / Code: M-PI; M-Or; M-Di; M-Co);
- ii. IT is an integral part of our business (Q.16 / Code: M-PI; M-Or; M-Di; M-Co);
- iii. In Africa, 80% of all Business IT projects are delivered within the triple constraints of time, cost and quality (Q.34 / Code: M-PI; M-Or; M-Di; M-Co);
- iv. Solution merits are defined by profitable deployment (Q.49 / Code: M-PI; M-Or; M-Di; M-Co).

People:

- i. IT engages with business leaders proactive on new ideas and system enhancements (Q.2 / Code: P-EI; P-Pi);
- ii. When recruiting, we are looking for technical resources with a sound knowledge (acumen) of the operations of our organisation (Q.20 / P-PI);
- iii. We communicate authentically with the business on all projects, incidents, problems and changes (Q.24 / Code: P-EI);
- iv. Our customers have clearly articulated strategic partnership strategies (Q.59 / Code: P-Pa);
- v. Our customer behaves in a collaborative manner (Q.60 / P-EI).

Agility:

- i. IT delivers solutions that enable organisational growth and transformation (Q.4 / Code: A-In);
- ii. IT participates in the engineering and continuous improvement of business processes (Q.6 / A-EA);
- iii. IT provides timely, relevant and the right data to decision makers (Q.10 / A-EA);
- iv. Knowledge Management assists with the development of new products and services (Q.11 / A-EA ; A-AI);
- v. The IT structure services the needs of our organisation (Q.13 / Code: A-EA; A-AI);
- vi. IT is turning business problems into opportunities (Q.15 / Code: A-EA);
- vii. Our organisation has a dashboard that shows employees how they perform and contribute to the achievement of the organisational goals and objectives (Q.18 / Code: A-AI);

- viii. Our solutions are simple to use and draw on the same data sources across the enterprise (Q.25 / Code: A-EA);
- ix. Transforming business strategy into business architecture is a value proposition of IT (Q.29 / Code: A-EA);
- x. IT (we) optimises, reuses, rationalises, consolidates, sustains and standardises technology and processes to timely meet business requirements in a changing environment, driving business efficiency and profitability (Q.30 / Code: A-EA);
- xi. IT innovation enables our organisation to stay ahead of our competitors (Q.31 / Code: A-In);
- xii. All IT services generate shareholder commitment while enabling benefit realisation and growth for business (Q.35 / Code: A-AI);
- xiii. Enterprise Architecture provides the flexibility to support current and future operations while competing in a competitive world (Q.37 / Code: A-EA);
- xiv. Our client's internal IT department knows their business strategy (Q.47 / Code: A-AI);
- xv. Our customer has clearly defined business objectives and solution requirements, and knows what success looks like (Q.58 / Code: A-EA).

6 questions (9.84%) are deemed by the participants to have ***pervasive material weaknesses***. The responses are grouped into the key focus areas as discussed in section 3.9.

Table: Questions deemed to have 'pervasive material weaknesses'

No.	Statement	UNIT OF ANALYSIS				THEMES											
		C-Level	CIOISM	ESP	Avg.	TRADITIONAL MANAGEMENT THEORY				PEOPLE				Agile			
						Planning	Organising	Directing	Controlling	IQ	B	Practical Intelligence	Partnering	EA	BT Alignment	Innovation	
3	As an enabler of business, IT participates in business strategy formulation	0.02	-0.02		0.00							x					
8	IT personnel have the business acumen to serve our organisation	0.00			0.00					X		x					
9	IT plays a facilitators role in organisational change	0.00			0.00						X	X					
27	Coaches are assigned to employees at all levels in the organisation to drive transformation of people, processes and technology		-0.26		-0.26							X					
28	Innovation is the deployment of industry practices as a new process to our organisation		-0.12		-0.12												X
36	When referring to business, we refer to them as partners and not as clients or users		-0.02		-0.02						X						

Management Theory:

- i. None.

People:

- i. IT personnel have the business acumen to serve our organisation (Q.8 / Code: P-IQ; P-EI);
- ii. IT plays a facilitators role in organisational change (Q.9 / Code: P-EI; P-PI);
- iii. Coaches are assigned to employees at all levels in the organisation to drive transformation of people, processes and technology (Q.27 / Code: P-EI);
- iv. When referring to business, we refer to them as partners and not as clients or users (Q.36 / Code: P-EI).

Agile:

- i. As an enabler of business, IT participates in business strategy formulation (Q.3 / Code: A-EA);
- ii. Innovation is the deployment of industry practices as a new process to our organisation (Q.28 / A-In).

Appendix L: Research Stage III – Force Field Analysis



Centre for CIO Research in Africa

Force Field Analysis



NO OBLIGATION: Participation in this study is none-compulsory and out of free will. All participants will receive a synopsis of the research findings once approved by the Academic Council.

Force Field Analysis enables one to more effectively analyse a challenge or opportunity and achieve the optimal goal.

The procedure is to:

1. **Decide** on what it is we want to achieve (**goal or aim**);
2. **List** all the things that might **affect** the goal being achieved (**verb & adjective**: e.g. *install the computer*);
3. **Categorise** these things into those that will **help** the goal to be achieved and those that will **hinder** this from happening;
4. **Rank** the **helping** and **hindering** things;
5. Take full **advantage** of the most **helpful** things and **eliminate** the most **hindering** things.

QUESTION: What are the complexities of IT implementations within organisations?

GOAL 1: Discover (explore) the complexities of IT implementation.

Rating phase iii	Helpful	Votes	%	Rating phase iii	Hindering	Votes	%
3	Valued network enabler	13	59.09%		Lacking industry knowledge	0	0.00%
In(BIT-A)	As an enabler of business, IT is an integral part of the organisation's value network.			Inn(BIT-A)	IT lacks knowledge of the industry they are servicing and is seen as a support function, not as a strategic enabler of business.		
	Cultural bridge builder	7	31.82%		Egocentric	0	0.00%
Staff(EI)	IT is a bridge builder with the correct business acumen, attitude and culture to drive constructive organisational change management.			Staff(EI)	IT specialists are overconfident and egocentric and like to work in isolation as individuals rather than in multidimensional teams.		
1	Business solutions innovator	18	81.82%	1	Disfunctional relationships	15	68.18%
In(Inn)	Collaboration and alignment is key to building trust and innovating new business solutions to address present and future business requirements.			Staff(EI)	Disfunctional relationships and poorly defined business requirement specifications result in mistrust and long lead-times during product development.		
	Controlling behaviour	0	0.00%		Change driven by policy	0	0.00%
Staff(EI)	IT needs the ability to control its own behaviour as well as the behaviour of business.			Staff(EI)	Organisational change is driven by policy and as a result ignorant of human behaviour and emotions.		
2	Enabling decision making	16	72.73%	2	Solutions are complicated	14	63.64%
In(EA)	Enterprise Architecture enables the creation of tailored user experiences that enable decision makers and stakeholders across the enterprise to find more complete information faster and easier for better business outcomes.			Inn(EA)	IT solutions are often over-engineered, complicated and do not consider the competency levels of the actual users on the shop floor.		
	Improving society	0	0.00%		Unable to adapt	5	22.73%
Staff(SP)	IT has a pervasive impact on society at all levels.			Staff(IQ)	As technologists, IT is unable to adapt to service the needs of business; their services are rigid, complex and do not provide sustainable business value.		
	Organisational integrator	3	13.64%		Management theory not established	1	4.55%
Staff(EI)	IT integrates the different parts of an organisation in a seamless and self-constructive manner.			Theory	IT management is not an established theory.		
	Breaking communication barriers	0	0.00%		Solutions do not provide for change	3	13.64%
Staff(EI)	As an agent of change, IT needs to break through communication barriers to transform human behaviours.			Inn(EA)	Poorly engineered solutions do not provide for rate of change in business processes and industry, which lead to poor business performance.		
4	Business acumen	9	40.91%	4	Paradigms limit progress	6	27.27%
Staff(EI)	IT needs to develop the business acumen necessary to service the business.			Staff(EI)	Organisational legacy and people paradigms limit progression, forward thinking and innovation within the organisation and IT implementation.		
5	(Agile) Forward thinking	8	36.36%		Poor relationships lead to mistrust	0	0.00%
Inn(EA)	IT needs to deploy flexible architectures that provide for agility and are forward thinking.			Staff(EI)	Poor relationships lead to mistrust, to the extent where IT becomes an order taker – to be told what to do.		
	Driver of change	5	22.73%	4	Lack of systems thinking	6	27.27%
Staff(SP)	IT needs the ability to influence the business to drive sustainable value and change.			Staff(PI)	Business needs skills in systems thinking and action learning to respond to the rapid rate of change required for competitive advantage.		
	Providing sustainable value	1	4.55%	3	Support for innovation	13	59.09%
Staff(IQ)	Strategies need to be broken-up into deliverable chunks which not only provide sustainable value, but can be changed as and when business and technology change.			Theory	Organisations are run using outdated management theories which do not support innovation and progressive elaboration.		
	Number of Attendees:	22			Number of Questionnaires	22	

Source: Business Education Design (Pty) Ltd +27 11 501 3001 ian@bused.co.za

NOTE: List your top 3 'helpful' and 'hindering' things ONLY.

In response to goal 1, the workshop suggests that organisations take full advantage of the following most helpful artefacts:

- i. Collaboration and alignment is key to building trust and innovating new business solutions to address present and future business requirements (Code: A-In);
- ii. Enterprise Architecture enables the creation of tailored user experiences that enable decision makers and stakeholders across the enterprise to find more complete information faster and easier for better business outcomes (Code: A-EA);
- iii. As an enabler of business, IT is an integral part of the organisational value network (Code: A-BI);
- iv. IT needs to develop the business acumen necessary to service the business that they are servicing (Code: P-EI); and
- v. IT needs to deploy flexible architectures that provide for agility and are forward thinking (Code: P-EA).

The workshop suggests that organisations avoid the following hindering artefacts:

- i. Disfunctional relationships and poorly defined business requirement specifications that result in mistrust and long lead-times during product development (Code: P-EI);
- ii. IT solutions that are over-engineered, complicated and not considering the competency levels of the actual users on the shop floor (Code: A-EA);
- iii. Running organisations using outdated management theories which do not support innovation and progressive elaboration (Code: M-PI; M-Or; M-Di; M-Co);
- iv. Organisational legacy and people paradigms that limit progression, forward thinking, and innovation within the organisation and IT implementation (Code: P-EI); and
- v. Organisations lack skills in systems thinking and action learning to respond to the rapid rate of change required for competitive advantage (Code: P-PI).



Centre for CIO Research in Africa

Force Field Analysis



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3. **Categorise** these things into those that will **help** the goal to be achieved and those that will **hinder** this from happening;
4. **Rank** the **helping** and **hindering** things;
5. **Take full advantage** of the most **helpful** things and **eliminate** the most **hindering** things.

QUESTION: How do organisations deal with the complexities of IT implementation?

GOAL 2: Apprehend (understand) the artefacts that lead to successful IT implementation.

Rating phase iii	Helpful	Votes	%	Rating phase iii	Hindering	Votes	%
	Understanding each other's strengths	0	0.00%		Provider of gadgets	2	9.09%
Staff(SP)	Successful relationships require a high level of emotional intelligence, intellectual qualities and experimental learnings from both business and IT. They need to understand each other's strengths and challenges.			Staff(SP)	As technologists, IT only provides gadgets.		
	Post-implementation reviews	0	0.00%		Inability to change	4	18.18%
Theory	Perform regular post-implementation reviews			Theory	Traditional and conventional management lack the agility and people skills to deal with rapid change in technology and business needs.		
3	Balanced employees	6	27.27%		Execution rigidity	2	9.09%
Staff	IT needs to employ balanced employees (EI, IQ and Practical Experience).			Theory	Project execution is often rigid in nature and follows a set deployment strategy (such as Waterfall).		
2	Common goal	14	63.64%		Generalisation of IT	1	4.55%
In(BIT-A)	Teamwork unifies different competencies working towards a common goal.			In(BIT-A)	Due to generalisation, business lacks the understanding of IT complexity.		
	Enabler of competitive advantage	3	13.64%	2	People capability	8	36.36%
In(BIT-A)	Business recognises IT as an enabler that delivers competitive advantage.			Staff(IQ)	In a deferring process there is no need for competency and people capability to deliver on the process.		
4	Ability to define requirements	5	22.73%	4	IT is a support function	5	22.73%
Theory	Business has the ability to identify and define their requirements, building IT into their business processes.			In(BIT-A)	IT is a support function and not a strategic enabler of business.		
	People skills	1	4.55%		IT treated as vendor	0	0.00%
Staff	IT needs people skills, emotional intelligence and experience to develop sustainable business solutions that are practical, realistic and simple to use.			In(BIT-A)	Business treats IT in the same way they treat their vendors.		
5	Delivering incremental value	4	18.18%	3	Lacks understanding	7	31.82%
Theory	Projects need to be sliced into smaller chunks that can deliver incremental and sustainable value more often with the flexibility to change whenever the business environment changes.			Staff(SP)	Business does not need to know the strategic importance of IT, and IT does not need to have knowledge of the business that are servicing.		
	Listening skills	1	4.55%		KPIs driving behaviour	0	0.00%
Staff(EI)	Treating each other as equals, business and IT need to learn to listen to each other and to communicate clearly in a language that is understood by both.			Theory	Traditional management theory tends to drive and focus on KPIs and does not induce the right behaviour.		
	Cultural knowledge	3	13.64%		Time constraints	3	13.64%
Staff(EI)	IT needs to exercise patience backed by cultural knowledge when implementing change.			Theory	Business does not give the right amount of time and thought to their business processes and the problem they attempt to resolve.		
	Mixed models	1	4.55%	1	Operational complexities	16	72.73%
Theory	Managers use different management styles to achieve their goals when implementing organisational strategy through people, processes and technology.			Theory	Business underestimates the amount of effort and time they have to invest in automating their business processes.		
1	Seeing the big picture	18	81.82%		Corporate empires	1	4.55%
In(EA)	Enterprise Architecture pre-empts future user demands.			Staff(EI)	Low levels of emotional intelligence lead to the creation of corporate empires and dysfunctional relationships which are ignorant of the impact that change has on human behaviour.		
5	Sponsor removes barriers	4	18.18%	4	Lacking innovation	5	22.73%
In(BIT-A)	The right business sponsor removes barriers and puts measures in place to track successes.			Staff	IT lacks knowledge, experience and initiative for business innovation.		
Number of Attendees:		22		Number of Questionnaires		22	

Source: Business Education Design (Pty) Ltd +27 11 501 3001 ian@bused.co.za

NOTE: List your top 3 'helpful' and 'hindering' things ONLY.

In response to goal 2, the workshop suggests that organisations take full advantage of the following most helpful artefacts:

- i. Enterprise Architecture to pre-empt future user demands (Code: A-EA);
- ii. Teamwork unifies different competencies working towards a common goal (Code: A-BI);
- iii. IT needs to employ balanced employees with the right levels of emotional intelligence, intellectual qualities and practical experience (Code: P-IQ; P-EI; P-PI);
- iv. Business has the ability to identify and define their requirements, building IT into their business processes (Code: M-PI; M-Or; M-Di; M-Co);
- v. Projects need to be sliced into smaller chunks that can deliver incremental and sustainable value more often, with the flexibility to change whenever the business environment changes (Code: M-PI; M-Or; M-Di; M-Co); and
- vi. The right business sponsor removes barriers and puts measures in place to track successes (Code: A-BI).

The workshop suggests that organisations avoid the following hindering artefacts:

- i. Business underestimates the amount of effort and time they have to invest in automating their business processes (Code: M-PI; M-Or; M-Di; M-Co);
- ii. In a deferring process, there is no need for competency and people capability to deliver on the process (Code: P-IQ);
- iii. Business does not need to know the strategic importance of IT, and IT does not need to have knowledge of the business that they are servicing (Code: P-Pa);
- iv. IT is a support function and not a strategic enabler of business (Code: A-BI); and
- v. IT lacks knowledge, experience and initiative for business innovation (Code: P-IQ; P-EI; P-PI).



Centre for CIO Research in Africa

Force Field Analysis



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3. **Categorise** these things into those that will **help** the goal to be achieved and those that will **hinder** this from happening;
4. **Rank** the **helping** and **hindering** things;
5. Take full **advantage** of the most **helpful** things and **eliminate** the most **hindering** things.

QUESTION: Why do IT professionals find it difficult to respond to the demands of business in a traditionally managed environment?

GOAL 3: Transforming the IT department from RIGIDITY to AGILITY.

Rating phase iii	Helpful	Votes	%	Rating phase iii	Hindering	Votes	%
	Turning problems into opportunities	0	0.00%	1	IT excluded from strategy formulation	16	72.73%
In(In)	IT turns business problems into opportunities.			In(BIT-A)	Business excludes IT from strategy formulation.		
	Restricted number of service requestors	0	0.00%		Support function	0	0.00%
Theory	Limit the number of people making project requests.			In(BIT-A)	IT is seen as a support function.		
4	Interactive development	5	22.73%		People behaviour	1	4.55%
Theory	Deliver small workable solutions more frequently with the ability to change with technology and business progression.			Staff(EI)	Change is ignorant to people's needs, behaviour, fears and emotions.		
5	Holistic view of change	4	18.18%		Unclear user requirements	1	4.55%
In(EA)	IT to create a holistic view of organisational change management.			In(BIT-A)	Lack of clearly defined User Requirement Specifications.		
	IT evolves with market trends	2	9.09%		Business politics	2	9.09%
In(EA)	IT evolves with the changing dynamics within business and market trends.			Staff(EI)	Business is structured to function in silos.		
	Business reaches out to IT	2	9.09%	2	Decisions made without IT	14	63.64%
In(BIT-A)	Sustainable shareholder value is determined by the business ability to reach out to IT and collaborate with them on requirements formulation and solution selection.			In(BIT-A)	Mergers and acquisition decisions are made without IT.		
3	Adapting to changing demands	11	50.00%		Lack of control over external factors	0	0.00%
In(EA)	IT architectures need to be forward looking, flexible and easy to adopt and adapt according to changing business demands.			In(EA)	Successful IT implementation is not influenced by business acumen or dependant on IT's understanding of the business drivers and the forces shaping the business direction.		
	Control human behaviour	0	0.00%		No feedback	0	0.00%
Staff(EI)	New business solutions consider the human factor and the impact on them.			In(EA)	Organisational structures and processes are designed to function independently and are not dependent on internal or external feedback.		
	Self-correcting structures	0	0.00%		Inability to manage change	2	9.09%
Staff	'Professionalism calls it early' – when spotting a problem it is called out. The earlier it is called, the earlier it can be fixed without impacting the processes or people.			Theory	Traditional management theory is flexible enough to deal with fast changing business requirements.		
	Business sponsor	3	13.64%		Disruptive change interventions	0	0.00%
In(BIT-A)	The right business sponsor removes barriers and puts measures in place to track successes.			Theory	Long lead-times and disruptive change management interventions stimulate sustainable growth.		
	Managing teams	0	0.00%	3	Lacking business knowledge	4	18.18%
Staff(EI)	Non-IT executives should have the ability to manage teams, relationships and partnerships, and source and align the appropriate technology for business priorities.			Theory	Technical competency alone guarantees IT success.		
1	Business and IT are aligned	16	72.73%		Unable to integrate culture	0	0.00%
In(BIT-A)	Business and IT alignment is essential from EXCO level right down to the workroom.			Staff(EI)	IT is unable to integrate organisational culture, processes and business relationship management principles with its business model.		
	Create value through team dynamics	1	4.55%		Inability to deliver value	2	9.09%
Staff(EI)	As highly complex integrated environments it is essential for business that teams work well together where the best of the team dynamic in its variations are leveraged and taken advantage of.			Theory	Inability to deliver business value on-time and on-budget, and to meet requirements and quality standards.		
2	Proactive business engagement	15	68.18%		IT lacks innovation	1	4.55%
In(BIT-A)	IT engages with business leaders proactively on new ideas and system enhancements.			In(In)	IT lacks business knowledge, experience and initiatives for business innovation.		
	Number of Attendees:	22			Number of Questionnaires	22	

Source: Business Education Design (Pty) Ltd +27 11 501 3001 ian@bused.co.za

NOTE: List your top 3 'helpful' and 'hindering' things ONLY.

In response to goal 3, the workshop suggests that organisations take full advantage of the following most helpful artefacts:

- i. Business and IT alignment is essential from EXCO level right down to the workroom (Code: A-BI);
- ii. IT engages with business leaders proactively on new ideas and system enhancements (Code: A-BI);
- iii. IT architectures need to be forward looking, flexible and easy to adopt, and adapt according to changing business demands (Code: A-EA);
- iv. Interactive development delivers small workable solutions more frequently with the ability to change with technology and business progression (Code: M-PI; M-Or; M-Di; M-Co); and
- v. IT needs to create a holistic view of organisational change management (Code: A-EA).

The workshop suggests that organisations avoid the following hindering artefacts:

- i. Business excludes IT from strategy formulation (Code: A-BI);
- ii. Mergers and acquisition decisions are made without IT (Code: A-BI); and
- iii. Technical competency alone guarantees IT success (Code: P-IQ; P-EI; P-PI).

Appendix M: Research Stage IV – Questionnaire



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Force Field Analysis



NO OBLIGATION: Participation in this study is none-compulsory and out of free will. All participants will receive a synopsis of the research findings once approved by the Academic Council.

Force Field Analysis enables one to more effectively analyse a challenge or opportunity and achieve the optimal goal.

The procedure is to:

1. **Decide** on what it is we want to achieve (**goal or aim**);
2. **List** all the things that might **affect** the goal being achieved (**verb & adjective**: e.g. *install the computer*);
3. **Categorise** these things into those that will **help** the goal to be achieved and those that will **hinder** this from happening;
4. **Rank** the **helping** and **hindering** things;
5. **Take full advantage** of the most **helpful** things and **eliminate** the most **hindering** things.

QUESTION: What are the complexities of IT implementations within organisations?

GOAL 1: Discover (explore) the complexities of IT implementation.

Rating phase iii	Rating phase iv	Helpful	Votes	%	Rating phase iii	Rating phase iv	Hindering	Votes	%
3	2	Valued network enabler	4	44.44%			Lacking industry knowledge	2	22.22%
In(BIT-A)	In(BIT-A)	As an enabler of business, IT is an integral part of the organisation's value network.			Inn(BIT-A)	Inn(BIT-A)	IT lacks knowledge of the industry they are servicing and is seen as a support function, not as a strategic enabler of business.		
		Cultural bridge builder	0	0.00%			Egocentric	1	11.11%
Staff(EI)	Staff(EI)	IT is a bridge builder with the correct business acumen, attitude and culture to drive constructive organisational change management.			Staff(EI)	Staff(EI)	IT specialists are overconfident and egocentric and like to work in isolation as individuals rather than in multidimensional teams.		
1	1	Business solutions innovator	6	66.67%	1	1	Disfunctional relationships	7	77.78%
In(Inn)	In(Inn)	Collaboration and alignment is key to building trust and innovating new business solutions to address present and future business requirements.			Staff(EI)	Staff(EI)	Disfunctional relationships and poorly defined business requirement specifications result in mistrust and long lead-times during product development.		
		Controlling behaviour	0	0.00%			Change driven by policy	1	11.11%
Staff(EI)	Staff(EI)	IT needs the ability to control its own behaviour as well as the behaviour of business.			Staff(EI)	Staff(EI)	Organisational change is driven by policy and as a result ignorant of human behaviour and emotions.		
2	2	Enabling decision making	4	44.44%	2	3	Solutions are complicated	3	33.33%
In(EA)	In(EA)	Enterprise Architecture enables the creation of tailored user experiences that enable decision makers and stakeholders across the enterprise to find more complete information faster and easier for better business outcomes.			Inn(EA)	Inn(EA)	IT solutions are often over-engineered, complicated and do not consider the competency levels of the actual users on the shop floor.		
		Improving society	0	0.00%			Unable to adapt	1	11.11%
Staff(SP)	Staff(SP)	IT has a pervasive impact on society at all levels.			Staff(IQ)	Staff(IQ)	As technologists, IT is unable to adapt to service the needs of business; their services are rigid, complex and do not provide sustainable business value.		
		Organisational integrator	1	11.11%		3	Management theory not established	3	33.33%
Staff(EI)	Staff(EI)	IT integrates the different parts of an organisation in a seamless and self-constructive manner.			Theory	Theory	IT management is not an established theory.		
		Breaking communication barriers	1	11.11%			Solutions do not provide for change	0	0.00%
Staff(EI)	Staff(EI)	As an agent of change, IT needs to break through communication barriers to transform human behaviours.			Inn(EA)	Inn(EA)	Poorly engineered solutions do not provide for rate of change in business processes and industry, which lead to poor business performance.		
4	2	Business acumen	4	44.44%	4		Paradigms limit progress	1	11.11%
Staff(EI)	Staff(EI)	IT needs to develop the business acumen necessary to service the business.			Staff(EI)	Staff(EI)	Organisational legacy and people paradigms limit progression, forward thinking and innovation within the organisation and IT implementation.		
		(Agile) Forward thinking	4	44.44%		2	Poor relationships lead to mistrust	4	44.44%
Inn(EA)	Inn(EA)	IT needs to deploy flexible architectures that provide for agility and are forward thinking.			Staff(EI)	Staff(EI)	Poor relationships lead to mistrust, to the extent where IT becomes an order taker – to be told what to do.		
		Driver of change	2	22.22%	4	3	Lack of systems thinking	3	33.33%
Staff(SP)	Staff(SP)	IT needs the ability to influence the business to drive sustainable value and change.			Staff(PI)	Staff(PI)	Business needs skills in systems thinking and action learning to respond to the rapid rate of change required for competitive advantage.		
		Providing sustainable value	3	33.33%	3		Support for innovation	2	22.22%
Staff(IQ)	Staff(IQ)	Strategies need to be broken-up into deliverable chunks which not only provide sustainable value, but can be changed as and when business and technology change.			Theory	Theory	Organisations are run using outdated management theories which do not support innovation and progressive elaboration.		
Number of Attendees:			9		Number of Questionnaires			9	

Source: Business Education Design (Pty) Ltd +27 11 501 3001 iam@bused.co.za

NOTE: List your top 3 'helpful' and 'hindering' things ONLY.

In respect to objective 1, the participants suggest that organisations take full advantage of the following most helpful artefacts:

- i. Collaboration and alignment is key to building *trust* and *innovating* new business solutions to address present and future business requirements (Code: A-In);
- ii. As an enabler of business, IT is an integral part of the organisation's value network (Code: A-BI);
- iii. Enterprise architecture enables the creation of tailored user experiences that enable decision makers and stakeholders across the enterprise to find more complete information faster and easier for better business outcomes (Code: A-EA);
- iv. IT needs to develop the business acumen necessary to service the business that they are servicing (Code: P-EI); and
- v. IT needs to deploy flexible architectures that provide for *agility* and are forward thinking (A-EA).

The participants suggest that organisations avoid the following hindering artefacts:

- i. Disfunctional relationships and poorly defined business requirement specifications result in mistrust and long lead-times during product development (Code: P-EI);
- ii. Poor relationships leading to mistrust, to the extent where IT becomes an order taker—to be told what to do (Code: P-EI);
- iii. IT solutions are often over-engineered, complicated and do not consider the competency levels of the actual users on the shop floor (Code: A-EA);
- iv. IT management is not an established theory (Code: M-PI; M-Or; M-Di; M-Co); and
- v. Organisations lack skills in systems thinking and action learning to respond to the rapid rate of change required for competitive advantage (Code: P-PI).



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Force Field Analysis



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1. **Decide** on what it is we want to achieve (goal or aim);
2. **List** all the things that might **affect** the goal being achieved (**verb & adjective**: e.g. *install the computer*);
3. **Categorise** these things into those that will **help** the goal to be achieved and those that will **hinder** this from happening;
4. **Rank** the **helping** and **hindering** things;
5. **Take full advantage** of the most **helpful** things and **eliminate** the most **hindering** things.

QUESTION: How do organisations deal with the complexities of IT implementation?

GOAL 2: Apprehend (understand) the artefacts that lead to successful IT implementation.

Rating phase iii	Rating phase iv	Helpful	Votes	%	Rating phase iii	Rating phase iv	Hindering	Votes	%
		Understanding each other's strengths	0	0.00%			Provider of gadgets	1	11.11%
Staff(SP)	Staff(SP)	Successful relationships require a high level of emotional intelligence, intellectual qualities and experiential learnings from both business and IT. They need to understand each other's strengths and challenges.			Staff(SP)	Staff(SP)	As technologists, IT only provides gadgets.		
		Post-implementation reviews	0	0.00%		3	Inability to change	3	33.33%
Theory	Theory	Perform regular post-implementation reviews			Theory	Theory	Traditional and conventional management lack the agility and people skills to deal with rapid change in technology and business needs.		
3		Balanced employees	0	0.00%			Execution rigidity	2	22.22%
Staff	Staff	IT needs to employ balanced employees (EI, IQ and Practical Experience).			Theory	Theory	Project execution is often rigid in nature and follows a set deployment strategy (such as Waterfall).		
2	1	Common goal	9	100.00%			Generalisation of IT	1	11.11%
In(BIT-A)	In(BIT-A)	Teamwork unifies different competencies working towards a common goal.			In(BIT-A)	In(BIT-A)	Due to generalisation, business lacks the understanding of IT complexity.		
		Enabler of competitive advantage	1	11.11%	2	3	People capability	3	33.33%
In(BIT-A)	In(BIT-A)	Business recognises IT as an enabler that delivers competitive advantage.			Staff(IQ)	Staff(IQ)	In a deferring process there is no need for competency and people capability to deliver on the process.		
4	2	Ability to define requirements	5	55.56%	4	3	IT is a support function	3	33.33%
Theory	Theory	Business has the ability to identify and define their requirements, building IT into their business processes.			In(BIT-A)	In(BIT-A)	IT is a support function and not a strategic enabler of business.		
		People skills	2	22.22%			IT treated as vendor	0	0.00%
Staff	Staff	IT needs people skills, emotional intelligence and experience to develop sustainable business solutions that are practical, realistic and simple to use.			In(BIT-A)	In(BIT-A)	Business treats IT in the same way they treat their vendors.		
5		Delivering incremental value	2	22.22%	3	2	Lacks understanding	5	55.56%
Theory	Theory	Projects need to be sliced into smaller chunks that can deliver incremental and sustainable value more often with the flexibility to change whenever the business environment changes.			Staff(SP)	Staff(SP)	Business does not need to know the strategic importance of IT, and IT does not need to have knowledge of the business that are servicing.		
		Listening skills	1	11.11%			KPIs driving behaviour	1	11.11%
Staff(EI)	Staff(EI)	Treating each other as equals, business and IT need to learn to listen to each other and to communicate clearly in a language that is understood by both.			Theory	Theory	Traditional management theory tends to drive and focus on KPIs and does not induce the right behaviour.		
		Cultural knowledge	0	0.00%			Time constraints	0	0.00%
Staff(EI)	Staff(EI)	IT needs to exercise patience backed by cultural knowledge when implementing change.			Theory	Theory	Business does not give the right amount of time and thought to their business processes and the problem they attempt to resolve.		
		Mixed models	0	0.00%	1	1	Operational complexities	6	66.67%
Theory	Theory	Managers use different management styles to achieve their goals when implementing organisational strategy through people, processes and technology.			Theory	Theory	Business underestimates the amount of effort and time they have to invest in automating their business processes.		
1	2	Seeing the big picture	5	55.56%			Corporate empires	1	11.11%
IN(EA)	IN(EA)	Enterprise Architecture pre-empt future user demands.			Staff(EI)	Staff(EI)	Low levels of emotional intelligence lead to the creation of corporate empires and dysfunctional relationships which are ignorant of the impact that change has on human behaviour.		
5		Sponsor removes barriers	2	22.22%	4		Lacking innovation	1	11.11%
In(BIT-A)	In(BIT-A)	The right business sponsor removes barriers and puts measures in place to track successes.			Staff	Staff	IT lacks knowledge, experience and initiative for business innovation.		
Number of Attendees:			9		Number of Questionnaires			9	

Source: Business Education Design (Pty) Ltd +27 11 501 3001 ian@bused.co.za

NOTE: List your top 3 'helpful' and 'hindering' things ONLY.

In response to goal 2, the participants suggest that organisations take full advantage of the following most helpful artefacts:

- i. Teamwork unifies different competencies working towards a common goal (Code: A-BI);
- ii. Business has the ability to identify and define their requirements, building IT into their business processes (Code: M-PI; M-Or; M-Di; M-Co); and
- iii. Enterprise Architecture pre-empts future user demands (Code: A-EA).

The participants suggest that organisations avoid the following hindering artefacts:

- i. Business underestimates the amount of effort and time they have to invest in automating their business processes (Code: M-PI; M-Or; M-Di; M-Co);
- ii. Business does not need to know the strategic importance of IT, and IT does not need to have knowledge of the business that they are servicing (Code: P-Pa);
- iii. IT is a support function and not a strategic enabler of business (Code: A-BI);
- iv. In a deferring process, there is no need for competency and people capability to deliver on the process (Code: P-IQ); and
- v. Traditional and conventional management lack the agility and people skills to deal with rapid change in technology and business needs (Code: M-PI; M-Or; M-Di; M-Co).



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Force Field Analysis



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1. **Decide** on what it is we want to achieve (**goal or aim**);
2. **List** all the things that might **affect** the goal being achieved (**verb & adjective**: e.g. *install the computer*);
3. **Categorise** these things into those that will **help** the goal to be achieved and those that will **hinder** this from happening;
4. **Rank** the **helping** and **hindering** things;
5. **Take full advantage** of the most **helpful** things and **eliminate** the most **hindering** things.

QUESTION: Why do IT professionals find it difficult to respond to the demands of business in a traditionally managed environment?

GOAL 3: Transforming the IT department from RIGIDITY to AGLITY.

Rating phase iii	Rating phase iv	Helpful	Votes	%	Rating phase iii	Rating phase iv	Hindering	Votes	%
		Turning problems into opportunities	2	22.22%	1	1	IT excluded from strategy formulation	7	77.78%
In(In)	In(In)	IT turns business problems into opportunities.			In(BIT-A)	In(BIT-A)	Business excludes IT from strategy formulation.		
		Restricted number of service requestors	0	0.00%			Support function	0	0.00%
Theory	Theory	Limit the number of people making project requests.			In(BIT-A)	In(BIT-A)	IT is seen as a support function.		
4		Interactive development	1	11.11%			People behaviour	1	11.11%
Theory	Theory	Deliver small workable solutions more frequently with the ability to change with technology and business progression.			Staff(EI)	Staff(EI)	Change is ignorant to people's needs, behaviour, fears and emotions.		
5	3	Holistic view of change	3	33.33%		2	Unclear user requirements	3	33.33%
In(EA)	In(EA)	IT to create a holistic view of organisational change management.			In(BIT-A)	In(BIT-A)	Lack of clearly defined User Requirement Specifications.		
		IT evolves with market trends	1	11.11%			Business politics	1	11.11%
In(EA)	In(EA)	IT evolves with the changing dynamics within business and market trends.			Staff(EI)	Staff(EI)	Business is structured to function in silos.		
		Business reaches out to IT	2	22.22%	2	1	Decisions made without IT	7	77.78%
In(BIT-A)	In(BIT-A)	Sustainable shareholder value is determined by the business ability to reach out to IT and collaborate with them on requirements formulation and solution selection.			In(BIT-A)	In(BIT-A)	Mergers and acquisition decisions are made without IT.		
3	3	Adapting to changing demands	3	33.33%			Lack of control over external factors	0	0.00%
In(EA)	In(EA)	IT architectures need to be forward looking, flexible and easy to adopt and adapt according to changing business demands.			In(EA)	In(EA)	Successful IT implementation is not influenced by business acumen or dependant on IT's understanding of the business drivers and the forces shaping the business direction.		
		Control human behaviour	0	0.00%			No feedback	0	0.00%
Staff(EI)	Staff(EI)	New business solutions consider the human factor and the impact on them.			In(EA)	In(EA)	Organisational structures and processes are designed to function independently and are not dependent on internal or external feedback.		
		Self-correcting structures	0	0.00%			Inability to manage change	2	22.22%
Staff	Staff	'Professionalism calls it early' – when spotting a problem it is called out. The earlier it is called, the earlier it can be fixed without impacting the processes or people.			Theory	Theory	Traditional management theory is flexible enough to deal with fast changing business requirements.		
3		Business sponsor	3	33.33%			Disruptive change interventions	1	11.11%
In(BIT-A)	In(BIT-A)	The right business sponsor removes barriers and puts measures in place to track successes.			Theory	Theory	Long lead-times and disruptive change management interventions stimulate sustainable growth.		
		Managing teams	0	0.00%	3	2	Lacking business knowledge	3	33.33%
Staff(EI)	Staff(EI)	Non-IT executives should have the ability to manage teams, relationships and partnerships, and source and align the appropriate technology for business priorities.			Theory	Theory	Technical competency alone guarantees IT success.		
1	1	Business and IT are aligned	8	88.89%			Unable to integrate culture	0	0.00%
In(BIT-A)	In(BIT-A)	Business and IT alignment is essential from EXCO level right down to the workroom.			Staff(EI)	Staff(EI)	IT is unable to integrate organisational culture, processes and business relationship management principles with its business model.		
		Create value through team dynamics	0	0.00%			Inability to deliver value	2	22.22%
Staff(EI)	Staff(EI)	As highly complex integrated environments it is essential for business that teams work well together where the best of the team dynamic in its variations are leveraged and taken advantage of.			Theory	Theory	Inability to deliver business value on-time and on-budget, and to meet requirements and quality standards.		
2	2	Proactive business engagement	4	44.44%			IT lacks innovation	0	0.00%
In(BIT-A)	In(BIT-A)	IT engages with business leaders proactively on new ideas and system enhancements.			In(In)	In(In)	IT lacks business knowledge, experience and initiatives for business innovation.		
Number of Attendees:			9		Number of Questionnaires			9	

Source: Business Education Design (Pty) Ltd +27 11 501 3001 ian@bused.co.za

NOTE: List your top 3 'helpful' and 'hindering' things ONLY.

In response to goal 3, the participants suggest that organisations take full advantage of the following most helpful artefacts:

- i. Business and IT alignment is essential from EXCO level right down to the workroom (Code: A-BI);
- ii. IT engages with business leaders proactively on new ideas and system enhancements (Code: A-BI);
- iii. The right business sponsor removes barriers and puts measures in place to track successes (Code: A-BI);
- iv. IT architectures need to be forward looking, flexible and easy to adopt, and adapt according to changing business demands (Code: A-EA); and
- v. IT needs to create a holistic view of organisational change management (Code: A-EA).

The participants suggest that organisations avoid the following hindering artefacts:

- i. Business excludes IT from strategy formulation (A-BI);
- ii. Mergers and acquisition decisions are made without IT (Code: A-BI);
- iii. Lack of clearly defined User Requirement Specifications (Code: A-BI); and
- iv. Technical competency alone guarantees IT success (Code: M-PI; M-Or; M-Di; M-Co).

Appendix N: List of Interview Transcripts

The transcripts of the interviews as index in the list below are available from the CD which forms part of this Thesis.

No.	Ref.	Company	Participant	Target Population			Consent	
				<i>C-level</i>	<i>CIO/ ISM</i>	<i>ESP</i>	<i>Ind.</i>	<i>Comp.</i>
1	N-1	PetroSA	Andrew Dippenaar	X			Yes	Yes
2	N-2	PetroSA	Faizel Mulla	X			Yes	Yes
3	N-3	Total SA	Nazlee Rajmohamed	X			Yes	Yes
4	N-3	Total SA	Wayne Kaak	X			Yes	Yes
5	N-3	Total SA	Frederique Simonnet		X		Yes	Yes
6	N-4	ESKOM	Sal Laher		X		Yes	Yes
7	N-5	Tullow	Andrew Marks		X		Yes	Yes
8	N-6	Botswana Oil Ltd	Galeboe Mmelesi		X		Yes	Yes
9	N-7	PetroSA	Bheki Malinga		X		Yes	Yes
10	N-8	PetroSA	Sello Lehong		X		Yes	Yes
11	N-9	IBM	Richard Downing			X	Yes	Yes
12	N-10	HP	Sandra Solomon			X	Yes	Yes
13	N-11	Gijima	Theo Hattingh			X	Yes	Yes
14	N-12	EOH	Dexter Roniger			X	Yes	Yes
15	N-13	EOH	Johannes Petrus Cronje			X	Yes	Yes
16	N-14	EOH	Brian Desmond Harding			X	Yes	Yes

Appendix O: Mapping the Stage I survey statements to the research questions

No.	Stage I Survey Statement	THEME			RESEARCH QUESTIONS		
		TRADITIONAL MANAGEMENT THEORY	PEOPLE	AGILE	What are the complexities of IT implementations within organisations?	How do organisations deal with the complexities of IT implementation?	Why do IT professionals find it difficult to respond to the demands of business in a traditionally managed environment?
1	IT delivers a secure and reliable service	Yes			Yes		
2	IT engages with business leaders proactively on new ideas and system enhancements		Yes		Yes		Yes
3	As an enabler of business, IT participates in business strategy formulation		Yes	Yes	Yes	Yes	Yes
4	IT delivers solutions that enable organisational growth and transformation			Yes		Yes	
5	The use of IT (such as mobility; big data management; business intelligence; etc.) accelerates organisational performance			Yes	Yes		
6	IT participates in the engineering and continuous improvement of business processes			Yes	Yes		
7	IT is an enabler of the organisational vision			Yes		Yes	
8	IT personnel have the business acumen to serve our organisation		Yes		Yes		
9	IT plays a facilitators role in organisational change		Yes		Yes	Yes	
10	IT provides timely, relevant and the right data to decision makers			Yes	Yes		
11	Knowledge Management assists with the development of new products and services			Yes	Yes		
12	IT contributes to the bottom line of our organisation	Yes					Yes
13	The IT structure services the needs of our organisation			Yes	Yes		Yes
14	IT provides the platform to reach our customers and service partners			Yes	Yes	Yes	
15	IT is turning business problems into opportunities			Yes	Yes	Yes	
16	IT is an integral part of our business			Yes			Yes
17	Strategic partnerships is a key growth area for business over the next 5 years		Yes		Yes	Yes	Yes
18	Our organisation has a dashboard that shows employees how they perform and contribute to the achievement of the organisational goals and objectives			Yes	Yes		
19	CIOs and IT Management need to have domain knowledge of their company		Yes		Yes		
20	When recruiting, we are looking for technical resources with a sound knowledge (acumen) of the operations of our organisation		Yes			Yes	Yes
21	Emotional intelligence is an important element of our recruitment and selection process		Yes		Yes	Yes	
22	We deliver products, services and processes that create value for our organisation			Yes	Yes	Yes	Yes
23	Our staff contribute more to the organisation's objectives if they are treated as responsible and valuable employees		Yes				Yes
24	We communicate authentically with the business on all projects, incidents, problems and changes		Yes				
25	Our solutions are simple to use and draw on the same data sources across the enterprise			Yes	Yes		

No.	Stage I Survey Statement	THEME			RESEARCH QUESTIONS		
		TRADITIONAL MANAGEMENT THEORY	PEOPLE	AGILE	What are the complexities of IT implementations within organisations?	How do organisations deal with the complexities of IT implementation?	Why do IT professionals find it difficult to respond to the demands of business in a traditionally managed environment?
26	IT has a clearly articulated partnership strategy		Yes		Yes	Yes	Yes
27	Coaches are assigned to employees at all levels in the organisation to drive transformation of people, processes and technology		Yes				Yes
28	Innovation is the deployment of industry practices as a new process to our organisation			Yes	Yes	Yes	
29	Transforming business strategy into business architecture is a value proposition of IT			Yes		Yes	
30	IT (we) optimises, reuses, rationalises, consolidates, sustains and standardises technology and processes to timely meet business requirements in a changing environment, driving business efficiency and profitability			Yes	Yes	Yes	
31	IT innovation enables our organisation to stay ahead of our competitors			Yes		Yes	Yes
32	The role of IT is changing and is even more critical than before	Yes		Yes	Yes		
33	IT needs to be agile, innovative and forward looking while learning from previous mistakes—doing it faster, better, smarter and cheaper			Yes	Yes	Yes	
34	In Africa, 80% of all Business IT projects are delivered within the triple constraints of time, cost and quality	Yes			Yes.		
35	All IT services generate shareholder commitment while enabling benefit realisation and growth for business			Yes	Yes		
36	When referring to business, we refer to them as partners and not as clients or users		Yes		Yes		Yes
37	Enterprise Architecture provides the flexibility to support current and future operations while competing in a competitive world			Yes	Yes	Yes	
38	Strategic partnerships allow the (internal) IT department to drive competitive differentiation faster		Yes		Yes	Yes	Yes
39	Strategic Partnership Management skills are different from Vendor Management		Yes				Yes
40	Communication is key to sustainable alignment		Yes		Yes		Yes
41	Positive behaviour builds constructive relationships		Yes				Yes
42	A committed workforce leads to increased efficiency		Yes				Yes
43	High emotional intelligence leads to better conflict resolution in the workplace		Yes				Yes
44	Practical intelligence is useful in resolving IT-related work problems		Yes				Yes
45	Partnering and collaborative relationships should benefit both parties		Yes		Yes	Yes	
46	Strategic partnerships provide access to scares and complementary skills		Yes			Yes	
47	Our client's internal IT department knows their business strategy			Yes	Yes	Yes	
48	We deliver products, services, solutions and processes that create value for our customers			Yes	Yes	Yes	
49	Solution merits are defined by profitable deployment	Yes					Yes
50	Strategic partnerships is a key enabler of growth for both IT and Business		Yes		Yes	Yes	Yes
51	Our solutions in Africa are sold and supported based on a broad set of strategic, marketing, operational and technical skills			Yes	Yes	Yes	

No.	Stage I Survey Statement	THEME			RESEARCH QUESTIONS		
		TRADITIONAL MANAGEMENT THEORY	PEOPLE	AGILE	What are the complexities of IT implementations within organisations?	How do organisations deal with the complexities of IT implementation?	Why do IT professionals find it difficult to respond to the demands of business in a traditionally managed environment?
52	We provide repeatable, standardised methodologies and procedures in delivering services			Yes	Yes	Yes	
53	We ensure that our customer maximises the use of our products			Yes	Yes		
54	We bring quality innovation to the table			Yes		Yes	
55	Our solutions road maps are aligned with our client's growth requirements			Yes		Yes	
56	Our customer provides us with opportunities to participate in new initiatives		Yes			Yes	Yes
57	Our customer's technical staff are of high quality with adequate skills (including business acumen and IQ) and staffing levels		Yes				Yes
58	Our customer has clearly defined business objectives and solution requirements, and knows what success looks like			Yes			Yes
59	Our customers have clearly articulated strategic partnership strategies		Yes		Yes		Yes
60	Our customer behaves in a collaborative manner		Yes		Yes		Yes
61	Cultural diversity has a positive impact on organisational behaviour, which increases performance and productivity		Yes		Yes	Yes	Yes

Appendix P: Language Editing Certificate

19 November 2015

Mr Colin Prince
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RE: CERTIFICATE FOR TECHNICAL EDITING AND PROOFREADING OF DOCTORAL THESIS

I, the undersigned, herewith certify that the technical editing and proofreading of the thesis of Colin Prince, entitled *Information Technology in a Complex Economy: The African Oil and Gas Industry*, has been conducted and concluded.

The finalised document was submitted to Colin Prince and copied to Dr de la Harpe on 19 November 2015.

Sincerely



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