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2017
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Optimise Information Technology (IT) to Maximise Business Value in South Africa

Sarah Louise Blignaut

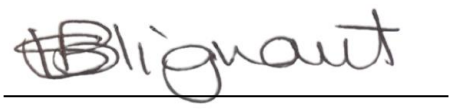
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A research article submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

Johannesburg, 2017

Declaration

I, Sarah Louise Blignaut, declare that this research article is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the Graduate School of Business Administration, University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.



Sarah Louise Blignaut

Signed at Pretoria

On the 25th day of August 2017

Acknowledgements

This research could not have been concluded without the assistance of several people. Each of them deserves a special thank you.

My husband Johan and son Ryan, for your unconditional love and encouragement. Without your support, I could not have undertaken this journey. Ryan, I especially treasured your hugs which convinced me to persevere, no matter the circumstance.

My supervisor and mentor, Marius Papenfus who influenced my decision to study an MBA. The ongoing practical guidance and reassurance that you provided was invaluable. Thanks for always inspiring me, and for the hours dedicated to reviewing the research notwithstanding the immense work pressure.

My Mum and late Dad, for making me believe that anything is possible.

SARS for financial support and affording leave to write examinations. Mr Shaik thanks for your unwavering support.

Jenny Croll for “crossing the t’s and dotting the i’s”.

Finally, although I cannot name you, I wish to acknowledge the participants who imparted their invaluable practical knowledge that has contributed to knowledge creation. Without your involvement, this research would not have been possible.

Supplementary Information

Nominated journal:	The African Journal of Information Systems
Supervisor / Co-author:	Marius Papenfus
Word count †:	13810
Key Words:	Information technology components, information technology organisation enablement, information technology prioritisation

† Including abstract, references, etc.

Abstract

The extent to which the pervasiveness of technology and real-time information influences the dynamics of global change and corporate survival is no longer a debate, but a reality. The rate of change emanating from the digital revolution is becoming increasingly faster and organisations will have to adapt. Technology is not merely a business enabler, but rather the platform facilitating business and is a source of both disruption and future opportunities. If organisations are to prosper, they will need to become digitally fluent in order to maximise the value obtained from technology.

This article positions the quintessential Information Technology (IT) components and their relative importance, drawing on the collective experiential knowledge of IT professionals totalling over 240 years. In order to gain understanding, insight and explore the depth, richness and complexity of the topic, a qualitative research methodology was followed which facilitated the gathering of contextual descriptions. To ensure meaningful results, ten senior executives from various organisations, who are well versed in technology, each with over fifteen year's practical experience knowledge were selected to be interviewed.

The study determined five key IT components, positioned with pertinent success factors and enabling frameworks that drive business value. **Strategy** encompasses scanning the environment for disruptive or enabling technologies and drives large scale innovation. **Execution** is a methodical approach to planning and guiding delivery from conception to completion to meet specific goals. The **maintenance** function includes the activities that are performed by an organisation to plan, design, deliver, operate and control IT services to meet customer requirements. **Sustainability** involves monitoring results to establish the value derived, but more significantly, to determine changes required to deliver value. Finally, **governance** underpins all IT components and relates to consistent management, policies, guidance, processes and decision-making with the relevant oversight and accountability.

The study advises organisations to prioritise efforts on the IT components of execution and strategy, followed by governance and finally, on maintenance and sustainability. If organisations are to survive and prosper in a changing technological world, it is recommended that effective leadership underpin these IT components with an enabling culture and conducive environment for risk taking, learning and innovation.

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INTRODUCTION

Purpose of the Study

The purpose of this research is to identify ways to optimise Information Technology (IT) and to recommend ways to improve the efficiency of IT delivery in order to provide meaningful information to organisations, minimise long-term business risk and drive business value.

Context of the Study

IT's advancement into cloud computing, mobility, the Internet of Things, machine learning and artificial intelligence is driving global innovation and disruption. Over the past 20 years, literature has dedicated increased focus on the relevance, importance and business value of IT. Academic interest has been incited due to the high expenditure on IT: calculated at $3.375 trillion dollars in 2016 (Lovelock et al., 2017), and the large proportion of IT spend when compared to total organisational expenditure. Hamilton (2013) reports that between 4% to 5% of an organisation's total revenue is comprised of IT spend, increasing to 10% for industries that are highly dependent on technology.

Most Chief Executive Officers realise that without a well-functioning IT service, their business is unlikely to survive and prosper. The Edelman Global Chair of Technology states that technology drives a large percentage of the world's greatest inventions and has the ability to create unprecedented growth and valuation (Edelman Trust Barometer, 2017). The King IV report recognises that technology is no longer merely a business enabler but rather, it provides the platform on which business is conducted and is the source of an organisation's future opportunities (Institute of Directors, 2016). An efficient and well managed IT operation positively impacts an organisation's profits and projects a professional image to external customers, suppliers and competitors (Hamilton, 2013).

Conversely, poorly managed IT can have a broader negative impact on the success of an enterprise and can make the difference between a successful business and one that struggles or fails. IT allows a firm to differentiate itself from its competitors or, at the least, creates demands to conform with competitive norms (Hamilton, 2013; Mithas, Tafti, & Mitchell, 2013).

Business transactions and processes are becoming increasingly dependent on technology and the IT environment is becoming more complex. There are a higher number of infrastructural and software components to manage over an often distributed technical landscape. The diversity of infrastructure and software has also increased as has the number and autonomy of users (Kappelman, McLean, Johnson, & Gerhart, 2014; Vanning, 2014).

IT failures are immediately visible throughout the organisation and to key stakeholders, inclusive of customers, competitors and stock analysts. An example is that of the Royal Bank of Scotland, whereby a software upgrade failure in June 2012 cost the bank in excess of £125 million and left customers without access to their accounts, and unable to make or receive payments for up to two weeks (Vanning, 2014). A study conducted in 2015 by IHS indicates that the cost of IT outages to North American companies totals $700 billion per annum (Stanganelli, 2016).

Due to the importance and visibility of IT, coupled with its complexity, risk and severity of failure, organisations must understand and optimise their IT investment to minimise risk and maximise business value.

Research Problem

There is an inadequate understanding of how organisations can leverage off the complexities of technology to add business value. This introduces significant risk and compromises the long term sustainability of organisations.

The first sub-problem is to determine the key components comprising IT. The second sub-problem is to determine the relative importance of the technology components that maximise business value. The third sub-problem is to establish and analyse the enabling response mechanisms and best practices per area to minimise risk and deliver organisational value.

Significance of the Study

Having reviewed much of the relevant literature, it was found that there is a high emphasis on the substantial IT expenditure, but limited work that addresses how organisations can optimise their IT operations with focused areas for prioritisation.

This study is intended to provide guidance to organisations, specifically those involved with IT such as Chief Executive Officers, Chief Information Officers or Chief Data Officers. It aims to better understand how to identify and prioritise technology components for optimisation without subjecting the organisation to undue risk.

Limitations of the Study

Due to the methodology selected for the study, the results may not be generalised beyond the sample population. The study focusses on the value add of technological components and hence, participants who are well versed in technology were selected to participate. To ensure meaningful results, senior executives from various organisations with over 15 year's experiential knowledge in technology were selected to be interviewed.

Based on the scope and the design of the research, it is not possible to generalise the findings to optimise business value using non-technology based mechanisms.

LITERATURE REVIEW: APPLICATION OF PRIOR RESEARCH

Information Technology Management is the discipline concerned with understanding IT as a corporate resource. The goal is to align IT with the organisation's strategic and operational needs and priorities. IT contributes to customer satisfaction, productivity, profitability and competitiveness through the design and development of technological products and services. The resources include tangible investments such as hardware, software, data, networks, data centre facilities as well as human resources required to install and maintain these assets. The central aim is to create value through technology and is thus heavily reliant upon the close alignment of technology and business strategies (Catalin & Alina, 2011; Harishchandra, 2016; Sukhwal, 2011). Bird (2010) highlights that this requires business and technology management to work collaboratively as a synergistic team.

In order to understand how to realise business value from IT, it is essential to establish the components that contribute to IT operational excellence. Lane (2011) defines a framework, composed of four primary functions:

- Strategic alignment: enable operational efficiencies and financial growth
- Value attainment: deliver solutions and services that return firm value
- Project delivery: predictable, consistent and efficient delivery
- Support delivery: provide cost efficient support.

Lane (2011) represents these functions in a pyramid structure with strategic alignment at the pinnacle, followed by value attainment, project delivery and support delivery at the base. A collapse of a lower level negatively affects the functions above it.

Traversing the four primary functions defined by Lane (2011), is the enabler of data analytics through the provision of the right data and information enabling informed decision making, integrated reporting, risk management, risk mitigation and facilitating sustainability (Goble & Bier, 2013; Teymouri & Ashoori, 2011; Wu, Chen, & Olson, 2014).

Support Delivery

The support delivery function is the foundation on which all else is built, and is hence the most important IT function. It encompasses technical operations such as systems and database administration, development, business process analysis, monitoring and help desk functions. A large percentage of the IT budget (approximately 70 - 80%) is spent sustaining existing systems. As a result, one of the key deliverables to optimise IT involves implementing efficient mechanisms and cost savings to provide the maximum amount of support at minimal cost (Lahtela & Jäntti, 2010; Lane, 2011).

Enabling Mechanisms

Information Technology Service Management (ITSM) is a process oriented discipline that details best practices. This enables and optimises IT services to satisfy tactical and strategic business requirements. ITSM leverages off IT Infrastructure Library (ITIL) standards, categorised into two functional areas: IT service support and IT service delivery (Leopoldi, 2016).

The IT service support area encompasses the following:

- Configuration management: physical and logical representation of the IT infrastructure and services
- Change management: standard procedures for managing changes
- Release management: testing, verifying and releasing IT changes
- Incident management: processes that restore service and minimise the impact to business
- Problem management: diagnosis of root causes of incidents to proactively prevent and manage them
- Service desk: a central point of contact between users and IT (Leopoldi, 2016).

The IT service delivery area includes the following functions:

- Availability management: optimise IT infrastructure capabilities, service and support to minimise service outages and sustain service levels
- IT service continuity: provide the required level of service following a service interruption
- Capacity management: manage current and future resource requirements
- Service level management: maintain and enhance service levels to the business

- IT service financial management: manage the costs and resources to meet expectations (Leopoldi, 2016).

In order to optimise IT support and delivery, the ITSM framework advocates a five step process inclusive of:

- Assessment: determine and document the current state
- Architect and design: develop a future state model
- Planning: develop a roadmap of evolution from the current to the desired state
- Implementation: deploy the proposed actions defined in the plan across the organisation to migrate to the future state
- Support: manage, maintain and enhance the future state (Leopoldi, 2016).

Leopoldi (2016) highlights that people, process, technology, organisational culture and integration dimensions are key perspectives within the framework to effectively manage and optimise IT as an enterprise wide, service oriented entity (Leopoldi, 2016).

Project Delivery

Projects are the mechanism through which IT value is delivered to the business. The most important perspective is to be predictable and reliable in delivering projects within time, budget and of the desired quality. Frequent failure to deliver will cause mistrust and lack of confidence in the IT department (Lane, 2011). Research conducted by McKinsey, in collaboration with the University of Oxford, indicates that on average, large IT projects overrun projected budgets by 45%, 7% run over time and deliver 56% less value than anticipated (Bloch, Blumberg, & Laartz, 2012).

Enabling Mechanisms

Lane (2011) accentuates that one of the most challenging tasks is the prioritisation of projects and proposes that there are various methods to achieve the portfolio of projects. Some organisations make the decisions at IT steering committees, others make prioritisation decisions at the executive committee level, or leave this prioritisation decision to the Chief Executive Officer. Regardless of the decision-making process, business must be involved in prioritising and funding the projects in order to make informed trade-offs in IT investment and prevent over-commitment of IT resources.

The PMBOK® (Project Management Body of Knowledge) provides knowledge of proven practices and forms the basis of a good project management methodology (Project Management Institute, 2013). Furthermore, project management methodologies, which are a set of methods, techniques, procedures, templates, rules and best practices contribute to a project's success (Špundak, 2014). Kerzner (2013) proposes that the use of a methodology ensures faster delivery through the control of the project's scope, time and costs whilst decreasing project risks and improving decision making and customer satisfaction.

Bloch et al. (2012) support this proposal and highlight that the key to successful IT projects is founded on a methodology comprised of four principal dimensions:

- **Focus on managing strategy and stakeholders**
  Establish an understanding of the project's strategic value by building a robust business case that is aligned with the organisational strategy. Build and maintain relationships with internal and external stakeholders and continuously engage to ensure business needs are aligned to the IT solution (Bloch et al., 2012).

- **Master technology and project content by securing knowledgeable talent**
  Create high performing teams with the expertise to orchestrate the technical aspects of the project. The team should be multidisciplinary to ensure adequate focus and highlight concerns across both technical issues and business value (Bloch et al., 2012).

- **Build effective teams with alignment to the end goals**
  A common vision, shared team processes and a high-performance culture should be established within the project team. Bloch et al. (2012) further propose that financial incentives of the project team congruent to business value delivery encourages increased focus on meeting the targets and ensuring effective change management.

- **Excel at project management practices**
  The project should be planned with short delivery timeframes utilising a gated process with a high focus on quality checking throughout the project. Tested best project management practices should be employed, inclusive of a strategic and disciplined project management office and rigorous requirements and change management process (Bloch et al., 2012).

Perry (2009) further contends that a methodology in itself is seldom referenced and used in order to add value. The concepts should be encompassed in a project management office process framework providing content assets such as dashboards, project management processes and process guidance. Through this process view, higher levels of project management skills and capabilities are established.

Value Attainment

The question asked for value realisation is what can be done with ten more percent versus what ten percent can be saved (Lane, 2011). Business executives have in the past been critical of IT: a global study conducted by the London School of Economics uncovered that only 25% expressed satisfaction with the performance of the IT investments (Grindley, 1999). However, a global study conducted by Korn Ferry in 2016 found that two-thirds of Chief Executive Officers now believe that technology will provide a competitive advantage to their organisations (Ferry, 2016).

The reason why companies invest in IT is to achieve a business result and positive financial return. It is imperative that the results are monitored, not only to realise whether the value has been achieved but also to determine whether changes are required in order to deliver the anticipated value (Lane, 2011).

Researchers argue that higher levels of value from IT are achieved with more focused goals for IT and conversely that a lack of alignment of IT with the business strategy results in an inability to realise sufficient value (Tallon, Kraemer, & Gurbaxani, 2000). Research indicates that fewer than 25% of organisations use formal return on investment (ROI) measures to evaluate IT investments (Mithas & Rust, 2016). In addition, the IT Trends Study ranks IT Value Proposition in the Business number six in the organisations' top ten most important IT management concerns (Kappelman, McLean, Johnson, & Torres, 2016).

Enabling Mechanisms

Historically, insights into the benefits and payoffs from IT investments have proved challenging. Initial value realisations mechanisms focused on positive productivity impacts from the IT investment (Brynjolfsson & Hitt, 1996 as cited in Tallon et al., 2000; Dewan & Min, 1997). This research, however, failed to consider broader economic and strategic impacts (Tallon et al., 2000).

Tallon et al. (2000) explore a process-level model of IT business value and the impact of IT on business activities within an organisational value chain. The value chain depicts a sequence of primary activities and support activities. The impact of IT on these value adding activities is measured.

The corporate goals are depicted by Tallon et al. (2000) in a quadrant. Low strategic positioning and operational effectiveness results in unfocused goals: where IT is not deemed critical to the business strategy. Low strategic positioning and high operational effectiveness result in an operations focus: where the IT goals are focused on speed, quality, cost reduction and improving organisational performance. Low operational effectiveness and high strategic positioning result in market focus: IT goals are focused on extending the market and changing practices. Finally, high operational effectiveness coupled with high strategic focus gives rise to a dual focus: IT is focussed on operations and the market.

When embarking on an IT initiative, it is recommended that routine, systematic and recurring evaluation, utilising approaches such as feasibility studies and pre- and post-implementation reviews should be undertaken. This encompasses up-front analysis of the prospective benefits to be achieved, as well as ongoing assessment to measure the payoff against the original business case. A 2015 report by the Project Management Institute shows thirty-nine percent of high performing organisations report high benefits tracking maturity versus nine percent of low performers (Schwalbe, 2015). In order to realise the value, there should be commitment from both IT and business to manage the requirements and more importantly, the results (Lane, 2011).

Strategic Alignment

Research affirms that there is strong support for closely aligning IT and business to obtain performance benefits and value (Chan & Reich, 2011; Chan, Sabherwal, & Thatcher, 2006; Kearns & Lederer, 2003; Leede, Looise, & Alders, 2002; Yayla & Hu, 2012).

Strategic alignment includes understanding the business, where IT works and adds value, and where it does not (Chan & Reich, 2011). It is necessary to establish and maintain good relationships with the business and key stakeholders, and measure all aspects of IT within each function, with clearly defined key performance indicators (Lane, 2011).

Findings from the Society for Information Management's 2016 IT trends study places aligning IT with the business as the top IT management concern (Kappelman et al., 2016). Strategic alignment involves defining business strategy from the perspective of IT and driving business initiatives that leverage off technology opportunities to deliver financial value (Cassidy, 2016; Lane, 2011).

Enabling Mechanisms

Cassidy (2016) proposes that in order to have true alignment, where IT provides optimal support for business goals, objectives and strategies, the IT strategy and the business strategy must be developed concurrently. The IT strategy must be embedded within the business strategy and direction must be fully aligned. The IT processes, infrastructure, applications, budgets and metrics should be reflective of the business.

COBIT® (Control Objectives for Information and Related Technologies) highlights the importance of strategic alignment in IT value delivery and utilises the goals cascade framework that shows that stakeholder drivers create stakeholder needs and inform the enterprise goals. These goals, in turn, influence the IT related goals cascading to enabler goals (ISACA, 2012; Kulkarni, 2017).

In contradiction to this view, other researchers proclaim that the close strategic alignment is not always desirable. The principal argument is that if the strategies of IT and business are too closely aligned, that businesses may stagnate as they are unable to respond adequately to technological opportunities. In addition, it is argued that technology is unpredictable and delivers unexpected outcomes and thus working towards fixed outcomes may be unrealistic (Ciborra, 1997 cited in Chan & Reich, 2011). Shpilberg, Berez, Puryear, and Shah (2007) further expound on this notion indicating that a narrow alignment focus underestimates the complexity of IT and that the emphasis should be on IT-driven growth, effective IT projects and delivery, followed by alignment.

Data Analytics

The abundance of available data, gathered via web-based, mobile or sensor generated mechanisms provides new insights from the highly detailed, contextualised and rich content. Data analytics increases the value-add across the organisational value chain from the definition and measurement of business strategy and provision of insight, to the identification of opportunities for maximum organisational advantage. Improved decision making is enabled via actionable enterprise intelligence and foresight, and associated actions resulting from the decisions and the measurement of their impact. Business analytics enhances value creation via increased efficiency and effectiveness: cost reduction and the optimal allocation of resources. The use of data within a process view reduces the siloed thinking and enables the measurement of key indicators and provides insight to continuously learn and improve the process and performance (Chen, Chiang, & Storey, 2012; Laursen & Thorlund, 2016; Lenssen, Simon Pickard, & Edgeman, 2013; Lim, Chen, & Chen, 2013). A study conducted by LaValle, Lesser, Shockley, Hopkins, and Kruschwitz (2011) indicates that top performing organisations use data analytics five times more than lower performing organisations.

The use of analytics of business data assists the organisation to understand its business and market and facilitates timely business decisions, enabling the effective management of risks (Chen et al., 2012; Kou, Peng, & Wang, 2014). Risk analytics has transformed from reporting past and present performance to data exploration, segmentation, statistical clustering, predictive modelling and event simulation and scenario analysis.

Enterprise intelligence and analytics are a key component of sustainable enterprise excellence which balances key stakeholder interests, inclusive of society and the natural environment. It contributes to organisational resilience and robustness through informed strategic decisions, responsible governance and superior performance and results (Lenssen et al., 2013). This is aligned to the King IV report on Corporate Governance for South Africa that recommends that leadership should be courageous to take risks and embrace opportunities in the best interests of the organisation and in a responsible manner (Institute of Directors, 2016).

The era of radical transparency, coupled with declining trust worldwide as measured by the Edelman Trust Barometer (2017) compels organisations to evolve from a traditionally siloed financial emphasis and reporting mechanism to focus on societal issues and integrated reporting. This encompasses strategy, governance, performance and opportunities in the context of the external environment, which results in value creation. IT underpins this new generation of reporting and tools and technologies can be applied to make corporate reporting faster, more accurate and efficient, with increased integration into business processes. Through the usage of data, driving knowledge management, predictive modelling and scenario planning, integrated thinking is stimulated, enabling the promotion of sustainable development which meets the present requirements, without compromising the ability of future generations to attain their needs (Institute of Directors, 2016).

Managing these intangible assets whilst accounting for externalities in the environment and society requires the recognition of social trends that may influence business developments (Churet & Eccles, 2014). Ongoing engagement and feedback from relevant stakeholders and sentiment analysis are utilised to capture public opinion on organisational strategies, marketing campaigns and product preference. Forums, blogs, social networks and content sharing services provide platforms from which useful intelligence can be gathered from the abundance of unstructured data via the use of data mining and natural language processing techniques (Cambria, Schuller, Xia, & Havasi, 2013).

Human Capital Strategies

The rapid changes in technology necessitate the redefinition of operational paradigms. Leadership must redesign organisations to move faster, adapt quicker and facilitate rapid learning. New human capital strategies are required to align how businesses are organised, how people are managed, developed and aligned. Mindset changes are required for the organisation to adopt the new rules. In order to survive and prosper, businesses must organise themselves for learning and facilitate a collaborative environment, that is focused on customer impact. Organisations must establish a culture of innovation and risk taking to ensure that they can adapt and survive (Bersin, Pelster, Schwartz, & van der Vyver, 2017).

RESEARCH METHODOLOGY

The research methodology used in this study was guided by the Wilson (2014) Honeycomb of Research Methodology. After an evaluation of the attributes and features of the primary paradigms in the context of the research topic, the qualitative research strategy was adopted. This decision was informed by the research philosophy and approach and further delineates the research design, data collection and analysis techniques.

Research Philosophy

- Epistemology: the researcher subjectively interacted with and observed research participants who have a contextual grounding and an in-depth knowledge of IT. The research was subjective, participatory and progressed from observation to theory, lending itself to the interpretivist epistemological approach (Khazanchi & Munkvold, 2003).
- Ontology: Khazanchi and Munkvold (2003) state that reality is socially constructed, subjective, complex and understood via the interaction of human actors. The study focused on the pragmatic technical knowledge of actors and their perceptions which is in line with the subjectivist ontological approach.
- Axiology: The interdependence of the researcher with the research, coupled with the experiential technical knowledge and the ability to draw on own values assisted to distinguish facts and draw relevant inferences, following a biased axiological approach.

The research philosophy is thus aligned to the interpretivist paradigm as described by Khazanchi and Munkvold (2003).

Research Approach

An inductive approach was followed, commencing with the theory of technology components and IT optimising practices, gathering data, detecting patterns to formulate a general conclusion.

Research Strategy

Wilson (2014) states that the qualitative approach focuses on processes and meanings that are not measured in terms of quantity, amount, intensity or frequency. Interviews and observation assisted the researcher to obtain an understanding of the actors' perspective. IT is a complex topic, is not well defined, is comprised of several components, is ever evolving and the relative importance of each component to meet the goal of optimising IT is not extensively documented. In order to gain understanding, insight and explore the depth, richness and complexity of the topic, the research method followed was qualitative which facilitated the gathering of contextual descriptions.

Research Design

Gomm, Hammersley, and Foster (2000) describe common features of case study to include:

- an in-depth study of a small number of cases
- data is collected and analysed on a large number of features of each case
- Cases are not manipulated and are naturally occurring
- The multiple sources of data inclusive of interviews, observation and literature enable the triangulation of findings.

Case study was thus the most appropriate and thus selected research design based on the research topic.

Data Collection

Data was collected via semi-structured interviews with key actors. The motive for using this enquiry method was to leverage off the open framework which allowed for focused, interactive and two-way communication. The pre-determined set of open questions prompted and guided the discussion but still provided the opportunity to further explore relevant themes and responses via open ended and probing questions. This method also enabled in-depth discussion of unique strategies and implementations that have enabled organisations to differentiate themselves through the innovative use of IT. Ten senior IT managers with over fifteen year's experiential knowledge in IT were interviewed. Reliability was facilitated through the keeping of meticulous records and validity was enabled via data triangulation and comparison.

Data Analysis Techniques

As recommended by Chambliss and Schutt (2012), whilst interviewing, detailed notes were made that assisted in identifying the problem. A matrix structure facilitated coding, categorisation and themes.

Ethical Considerations

Interviewees were not coerced to participate, but rather were informed of the reason for the study and provided details of what the participation entails. Written consent was obtained from each participant at the commencement of the interview. The names of interviewees and their respective organisations were not disclosed in order to protect confidentiality.

RESEARCH FINDINGS

The research findings were focussed around themes that were generated from the thematic analysis after interviewing respondents. Ten respondents were interviewed, who are identified as P1-P10 (Participant one = P1) in order to ensure confidentiality and the protection of their identity. The number of years in IT of the participants ranges from 18 to 32. The combined practical IT experience of the participants totals 245 years, with an average of 25 year's IT experience per participant. The procedures and techniques that were used in collecting and analysing the data followed the approach as discussed in the section on Research Methodology. A combination of the findings, analysis and discussion in a single section seemed appropriate to prevent a repetition of information.

The key themes of interest were examined to provide further detail as to their importance and mechanisms on how IT can add value to the business. The main themes include strategy, execution, maintenance, sustainability and governance. Both descriptive material and deeper analysis and interpretation of the themes were explored. Thereafter the importance of IT to business was discussed.

Key IT Components

The application of prior research identified a framework of four primary IT functions: strategic alignment, value attainment, project delivery and support delivery (Lane, 2011). Based on the interaction with participants, the model has been extended to include external forces, which informs strategy, execution, maintenance and sustainability. These four quadrants are underpinned by governance, as illustrated below in Figure 1: IT Components in Context of Relevant Frameworks. The relevant frameworks inclusive of COBIT®, PMBOK®, Prince2®, ITSM, ITIL and King IV have been depicted.

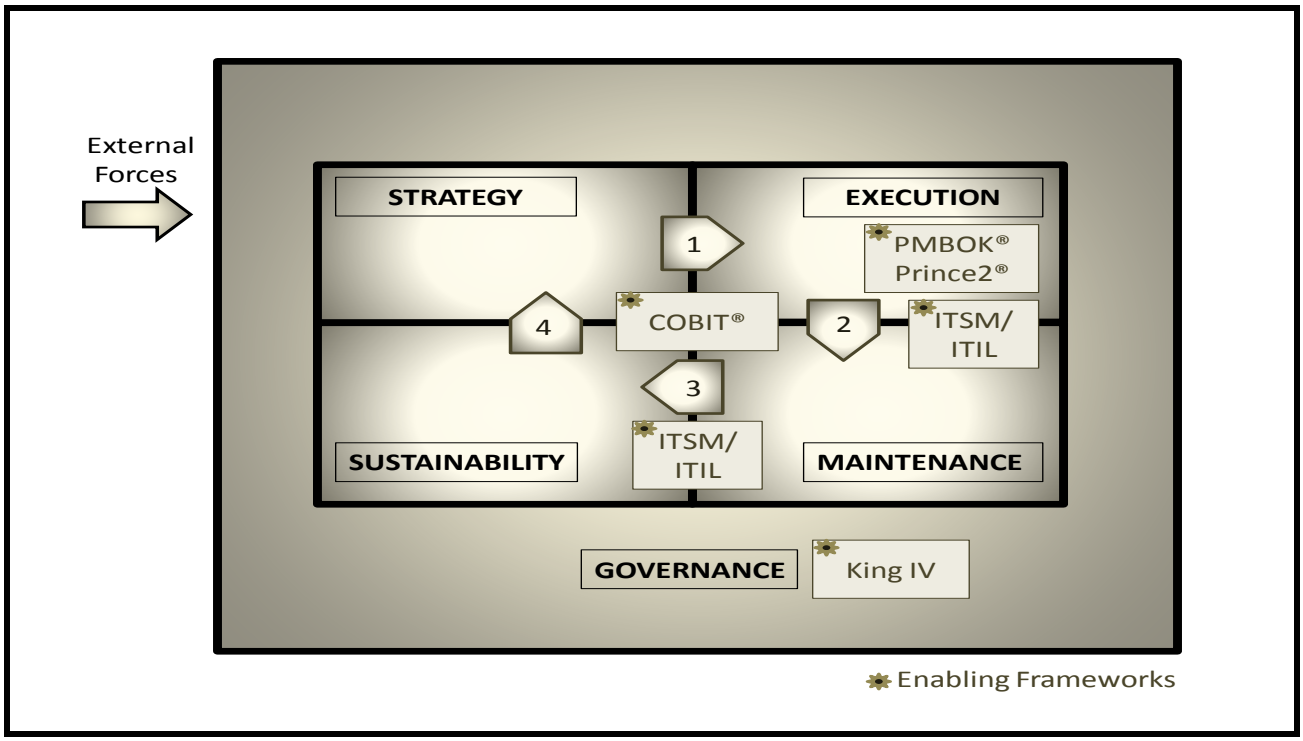


Figure 1: IT Components in Context of Relevant Frameworks

Strategy: Lane (2011) defines strategy as an enabler for operational efficiencies and growth. Similarly, Chan and Reich (2011) describe strategy as understanding the business, identifying where IT adds value and where it does not. Strategy encompasses scanning the environment for disruptive or enabling technologies and it drives large scale innovation and change. It includes influencing others to get buy-in and sets the culture for the organisation. The talent strategy is determined and key decisions such as in-sourcing and out-sourcing resource models are established. The right mix of technology and the co-existence of old and new technologies are defined. As depicted by arrow 1 in Figure 1: IT Components in Context of Relevant Frameworks, strategy influences and informs execution.

Execution: Bossidy, Charan, and Burck (2011) refer to execution as a discipline or a "systematic way of exposing reality and acting on it" (Bossidy et al., 2011, p. 22). It encompasses programme and project management and is a methodical approach to planning and guiding delivery from conception to completion to meet specific goals. The Project Management Institute (2013) defines project management as the application of knowledge, skills, tools and techniques to activities in order to meet requirements. P1 summarises execution as "the conversion of thought leadership into delivery", enabling the vision. As documented in the Application of Prior Learning, Lane (2011) describes projects

as a means to deliver IT value to the business. As depicted by arrow 2 in Figure 1: IT Components in Context of Relevant Frameworks, execution influences and impacts maintenance.

Maintenance: The large value spent on maintaining existing technical operations necessitates focus in order to ensure maximum value-add for minimum cost (Lahtela & Jäntti, 2010; Lane, 2011). The maintenance function encompasses the activities that are performed by an organisation to plan, design, deliver, operate and control IT services to meet customer requirements. It encompasses IT service support and delivery (Leopoldi, 2016). P4 and P9 expound that maintenance includes the "standard tasks of ensuring systems are updated, supported by the vendors": P4 and P9: "maintaining is about keeping the lights on". Arrow 3, as depicted in Figure 1: IT Components in Context of Relevant Frameworks shows that maintenance informs sustainability.

Sustainability: For decades, corporate sustainability has been limited and primarily tied to corporate branding. However, a shift is underway as technology brings substance to targets and organisations acknowledge the risk of inaction. P5: "look at organisations that have gone down: Nokia or Blackberry: they lacked sustainability". Lane (2011) stresses the importance of monitoring results to establish the value derived, but more significantly, to determine what changes are required to deliver the anticipated value. P1: "Sustainability is about survival – you must ensure that you are forward looking in order to ensure that your strategy is enabled with the right decisions. It is to make sure that we can sustain what we have today into the future".

Sustainability includes value measurements such as feasibility study reviews, post implementation reviews and cost containment and is facilitated by the provision of business value dashboards. Arrow 4 as depicted in in Figure 1: IT Components in Context of Relevant Frameworks, indicates that maintenance inputs into the strategy.

Governance relates to consistent management, policies, guidance, processes and decision-making with the relevant oversight and accountability. Van Grembergen and De Haes (2017) emphasise that the pervasive use and critical dependency on IT requires specific focus on governance. Although governance is included in several of the IT components already discussed, based on the importance of this component, and because it underpins all IT components, it has been discussed as a separate theme. This is an addition to the pyramid

view provided by Lane (2011). As depicted in Figure 1: IT Components in Context of Relevant Frameworks, governance frameworks exist such as COBIT®, Prince2®, ITSM, ITIL and the King IV report, to name a few, and South Africa is pioneering in its adoption thereof.

The Importance of Technology Components to Add Business Value

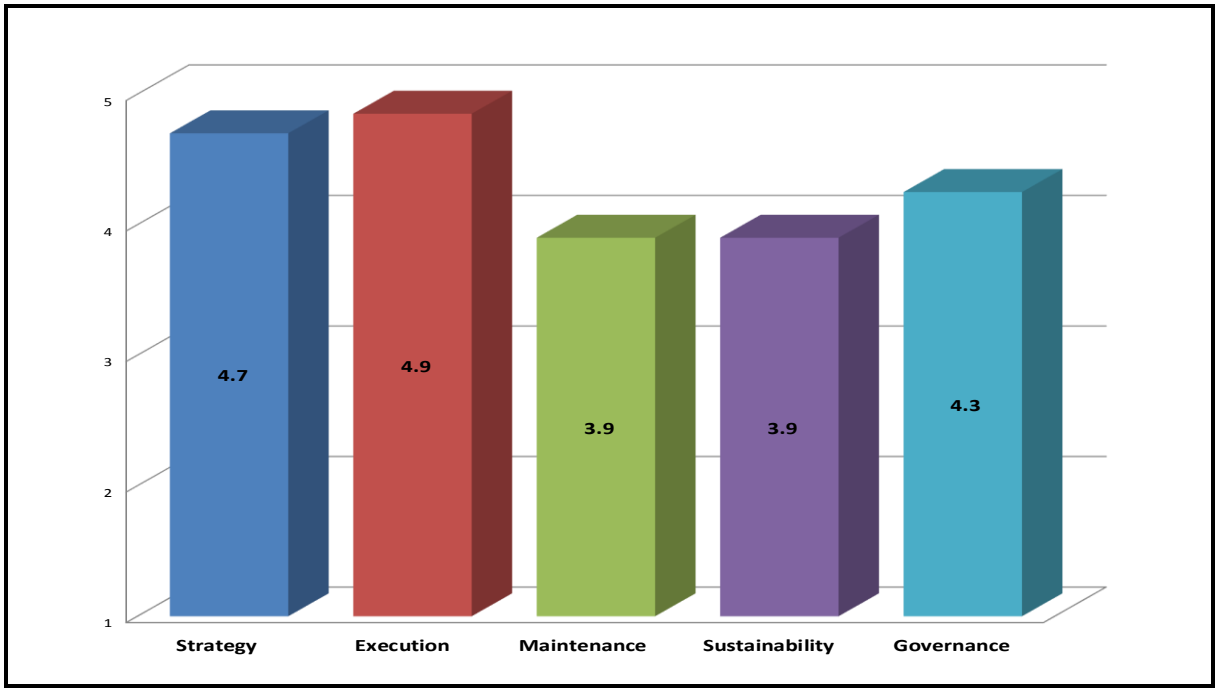


Figure 2: Importance of IT Components to Add Business Value

The interview transcripts produced evidence that **execution** was rated the highest contributor to maximise value add as illustrated in Figure 2: Importance of IT Components to Add Business Value. On a scale of 1 to 5 – where 1 is not important and 5 is very important, eight participants rated execution as very important (5). The remaining two participants rated this component as 4.5 and 4 respectively. The median of the execution component was 5.

Very Important	5	P3	P4	P5	P6	P7	P8	P9	P10
	4.5	P2							
	4	P1							
	3.5								
	3								
	2.5								
	2								
	1.5								
Not important	1								

Figure 3: Participant Rating of the Importance of Execution to add Business Value

Strategy was rated the second most important IT component to add business value, with an average of 4.7. Eight participants rated execution as very important (5), whilst the remaining two participants rated this component 4 and 3.5 respectively. The median for the strategic component was 5.

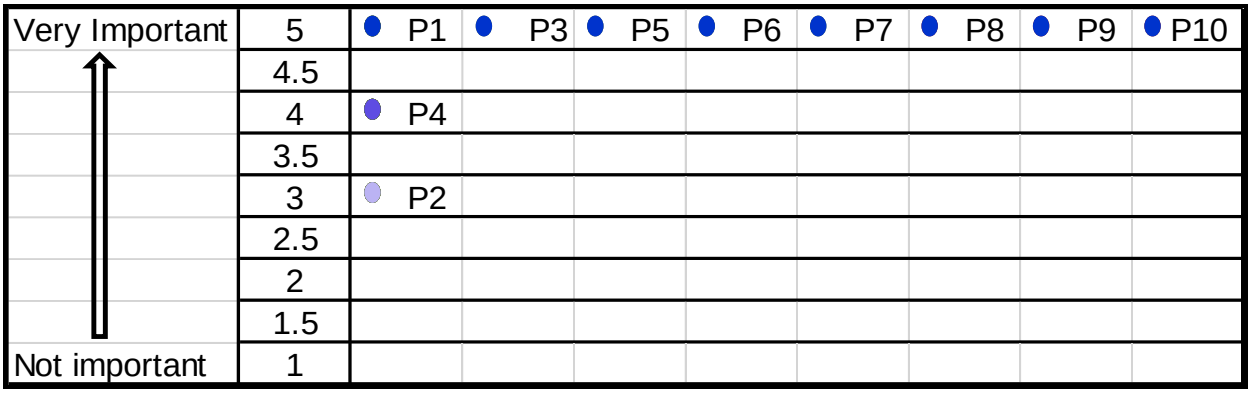


Figure 4: Participant Rating of the Importance of Strategy to add Business Value

Governance was rated on average as the third highest component contributing to business value at a score of 4.3. Five participants rated governance as very important (5), two rated it as a 4, one rated it as 3.5 and two rated the importance of governance as a 3. The median was 5 for the governance component. The standard deviation of 0.9 of the importance of governance is the highest showing disparate views of the participants in terms of the importance to the business value-add.

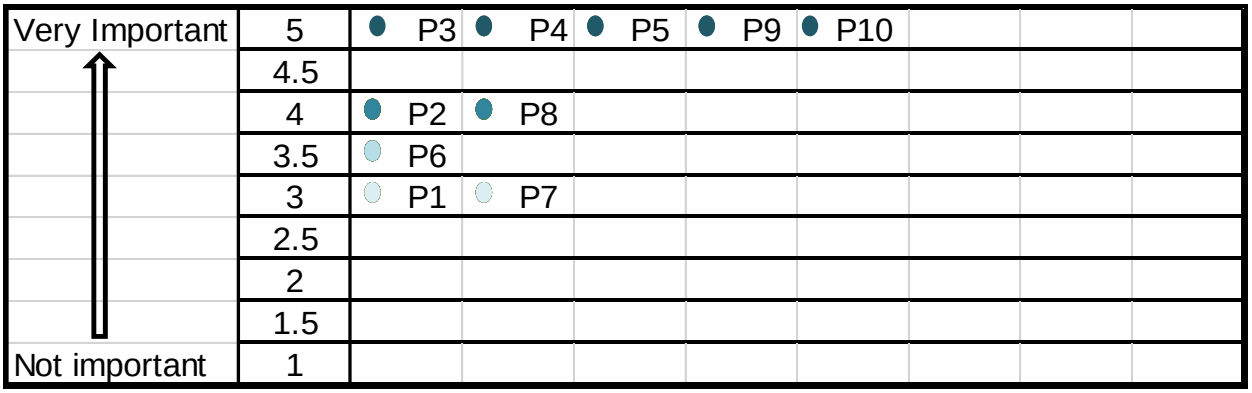


Figure 5: Participant Rating of the Importance of Governance to add Business Value

Sustainability and **maintenance** were considered of lower importance in terms of the value add of IT to the business, both with an average of 3.9 and a median of 4. Two participants rated sustainability as very important (5), five rated it as a 4 and three rated it as a 3.

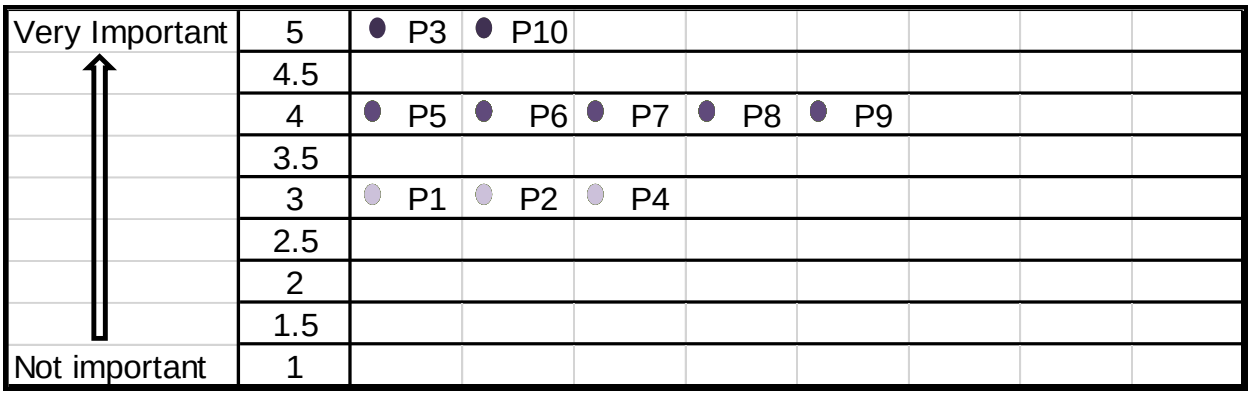


Figure 6: Participant Rating of the Importance of Sustainability to add Business Value

The maintenance component was marginally different whereby two participants rated it as a 5 (very important), one rated it as 4.5, three rated the importance of maintenance as a 4, one participant rated it as 3.5 and the remaining three participants rated the importance of maintenance as a 3.

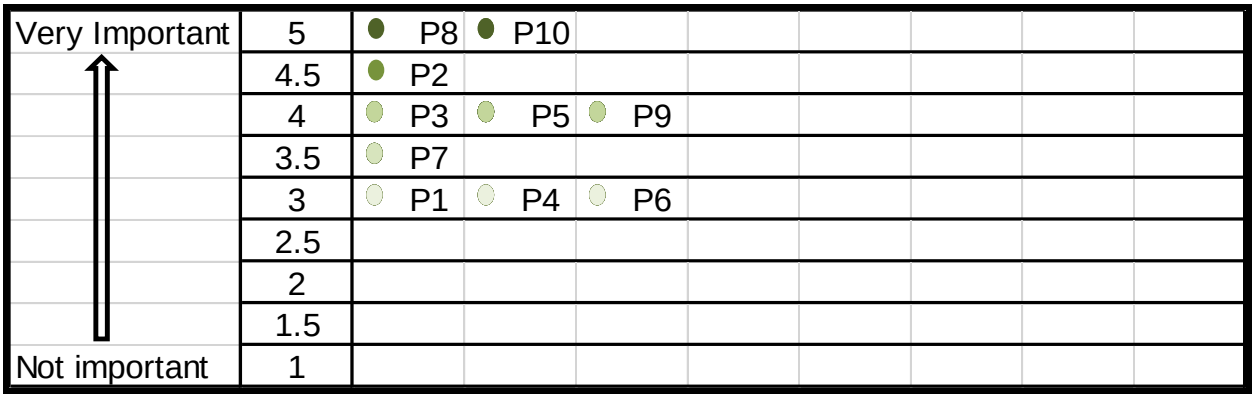


Figure 7: Participant Rating of the Importance of Maintenance to add Business Value

Importance of Strategy

The participants rated strategy with an average of 4.7 out of 5, and a median of 5 as detailed in Figure 2: Importance of IT Components to Add Business Value. Strategy is rated as the second most important component for IT to deliver business value, slightly trailing execution.

Participants endorsed the importance of strategy by stressing that the “Strategy sets the direction of the organisation”: P1. It creates a vision for the organisation. A well-defined and clearly communicated strategy establishes the base against which an organisation can measure their success. It assists organisations to define their core capabilities, leveraging off their strengths and addressing weaknesses to mitigate risks to deliver financial gains. Strategy helps organisations to position themselves so that they focus on the right things, it sets them up for success now and in the future.

The strategy provides the organisation with a common purpose, goals and objectives. It ensures that everyone works towards a common outcome. Resources are effectively allocated to the same goals and objectives and it prevents organisations from losing sight of the organisational aims.

“If you get the strategy wrong, everything else is irrelevant”: P3 and “Strategy defines success”: P9. P10 indicated “If you don't know where you going, there is no way that you can execute something that is actually going to help you or enable you to get to where you want to be with your business”. P5 stressed that “the formulation of the strategy sets the tone of everything that must happen. If you do not get that right, you are just surviving”. These findings are aligned to those held by Chan and Reich (2011), Lane (2011) and Cassidy (2016).

It is evident from the interviews conducted there are still disparate views whether IT drives business strategy or vice versa to derive maximum business value.

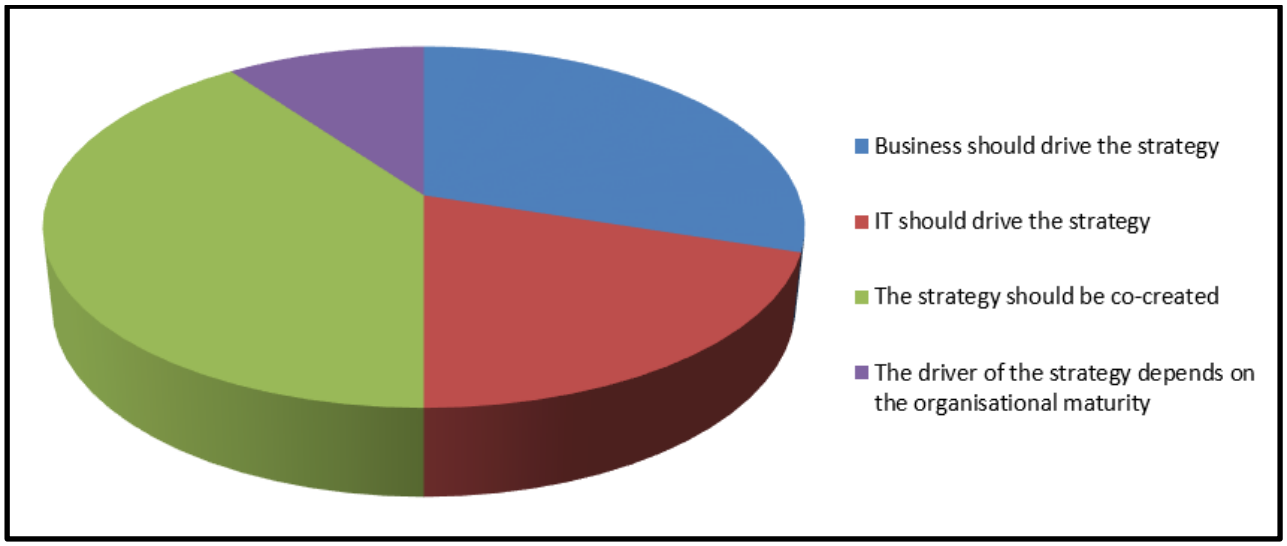


Figure 8: Driver of Strategy

P2 indicated that it depends on the business and the maturity level of the organisation. “Organisations that are technology driven such as Google will have strategies that are driven by IT. However, as organisations mature, the business will increasingly drive the IT strategy.”

Other participants are aligned to the view of Shpilberg et al. (2007) proposing that IT should drive business as substantiated by P1: “I lean towards the fact that IT should drive by virtue of the fact that business is sort of becoming irrelevant if it's not IT enabled and we see a lot of disruptive technologies in the world driving global trends”. This is necessitated by IT having a detailed “understanding of what drives the strategy in order to differentiate your organisation from your competitors”: P1. P3 supports this view: Right now, technology changes are so fundamental and IT has a huge opportunity to be driving the business strategy.”

The remainder of the respondents are of the opinion that the strategy is best co-created by using a mix of technologists and business representatives, as supported by Bird (2010) and Cassidy (2016). “Most successful businesses are those where the leaders have the vision from business and IT perspectives”: P4, whilst P5 suggested, “Business must be connected to IT to conceive what IT can do for them”. This viewpoint is also advocated by Catalin and Alina (2011), Harishchandra (2016) and Sukhwal (2011) who propose that technology and business management need to work collaboratively to create value.

Irrespective of the strategic driver, there was alignment across all participants that IT should understand the business operations in order to provide contextual guidance and advice in terms of the technological opportunities, aligned to the views of Chan and Reich (2011). Furthermore, business needs to become more technology aware and comprehend the value that can be added via the use of technology. As technology becomes more pervasive and disruptive, business must “understand the complexities of IT”: P4 and “business needs to become connected with IT to understand what IT can do for them”: P5. P9 was of the view that: “you need to probably have an EXCO that is technology savvy”.

The success of a strategy is mainly attributed to leadership and management talent. Leaders need to be creative and stay abreast of the latest trends and the associated impact on their business. P9 highlighted the importance of having a forward looking strategy “to be able to see the megatrends beforehand”. External forces such as legislative changes, economic and political climate, competitive behaviour as well as internal forces influence the strategy. In

order to add business value, the strategy must be sufficiently agile to adapt to ongoing technological disruption and advancements.

The application of prior research accentuated that data analytics facilitates the definition of business strategy, insight and the identification of opportunities to add business value. The intelligence extracted from data also enables improved decision making (Chen et al., 2012; Laursen & Thorlund, 2016; Lenssen et al., 2013; Lim et al., 2013). This was confirmed by participants, who articulated that data is a key ingredient of a successful strategy to enable organisations to understand stakeholder needs, identify and predict trends and adapt accordingly. “The most successful strategies that will make organisations excel are those that depend on data”: P1.

Ownership of the strategic vision and the communication of the strategy were mentioned as critical success factors in order to add business value. P5 was of the opinion that the strategic direction is not something that can be outsourced. “If leaders abscond from this responsibility, the strategy will fail to deliver business value”. Likewise, in order for a strategy to be successful, “stakeholder buy-in and alignment is imperative”: P8.

As depicted in Figure 1: IT Components in Context of Relevant Frameworks, the strategy informs and influences execution. As expressed by Lane (2011), one of the most challenging tasks is the prioritisation of projects. All participants in the study concurred and were of the opinion that too little focus is spent on prioritising the programs of work. This is verbalised by P4: “this process is generally very reactive which puts you on the back foot”. P3 referred to prioritisation as a “balancing act that is influenced by several factors”. “What is actually of paramount importance is the necessary insight to probe and interrogate all the initiatives in order to filter out what you are not going to do.”: P1. P9 concurred: “there should be proper time spent prioritising the value of an objective, or an initiative linked to a strategic objective, to the value that it can bring to the organisation, versus the costs”.

P1 indicated that strategy must be informed by “the execution cycle and your capacity to deliver”, inclusive of funding and resources: “nobody has an infinite number of resources and money to execute”. Several participants referred to the lack of human resources as a key constraint, especially in the South African context given the skilled resource scarcity. Although out-sourcing is mentioned as a mechanism to complement internal human capacity, it was stressed that human resources are not the only constraint. P1 listed other constraints:

“you only have so many decision makers, you only have so many test platforms, you only have so many delivery time slots to take solutions into production”. These are all factors that influence “the decision making funnel and give you a good sense of how to throttle execution based on the constraints”. In order for value to be added, P7 recommended that one should work within “a priority framework” with clearly defines prioritisation criteria to prevent the scenario where “the group that shouts the loudest gets the highest priority”: P6. P10 concurs that prioritisation is an essential component to add value. The Pareto principle is proposed: “get 80% of the value for 20% of the effort” or only embark on projects “if they result in a ten-fold improvement”.

The projects must be aligned to the organisational strategies and goals. Only those projects that contribute to the strategy should be undertaken. P9: “If it does not fit or enable anything that is listed as part of the strategy and the lower level details of the strategy then it should not be part of the scope”.

Summary of Findings: Strategic Component

The thematic material related to the value add of the strategic component of IT, concluded that strategy is a very important IT component contributing to business value. There was general dissent amongst the participants whether IT should drive business strategy or vice versa. However, a common theme was that IT is critical to business success and a strong IT influence is required. This can be achieved by IT setting the strategy, by business being more technology conscious, or alternatively via a co-creation mechanism.

A causal analysis has been presented in Figure 9: Cause-effect Diagram: Strategy, in summary of the success factors identified to derive business value.

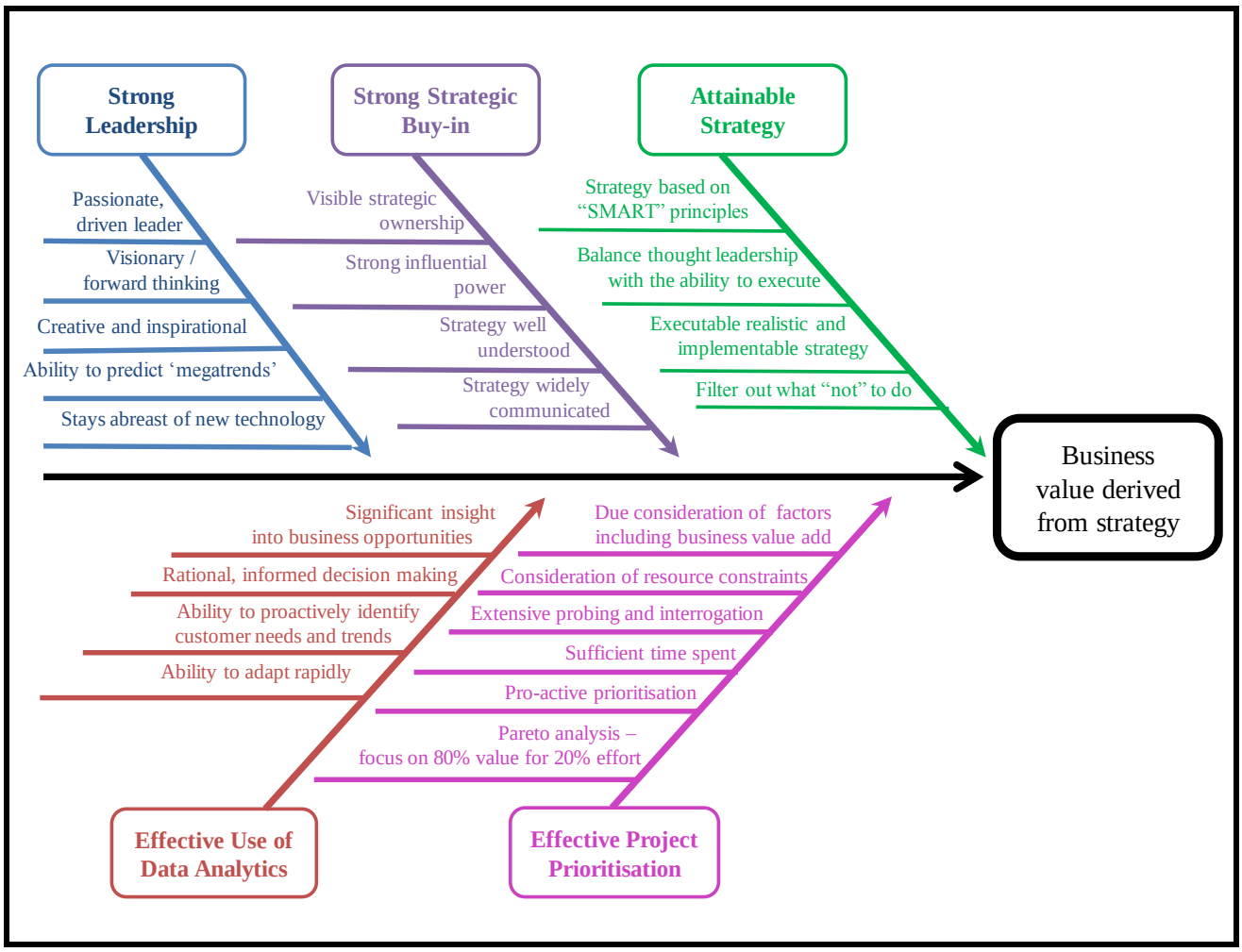


Figure 9: Cause-effect Diagram: Strategy

Importance of Execution

Execution was rated the highest priority to contribute to business value, with an average of 4.8 out of five and a median of 5 as detailed in Figure 2: Importance of IT Components to Add Business Value. Eight of the ten participants rated execution as very important. This thinking is aligned with Bossidy et al. (2011) who indicate that strategy fails to deliver results unless it results in specific actions. Furthermore, Lane (2011) specifies that the most important perspective is to deliver on time, on budget and of the desired quality.

P2 justifies the high rating of execution because "that's where the tyre hits the tar, what you have strategised about comes to fruition". P4 similarly concludes that "strategy is important, but execution thereof is critical – which can make or break you. The potential for loss comes

in the execution phase". P8 concurs: "It is important to be able to execute according to the strategy, and it is very important to have a firm and capable execution capability because, without that, none of the plans that you make will be executable".

The PMBOK® framework (Project Management Institute, 2013) stresses the criticality of the project sponsors in successful delivery. They have over all accountability for the project and are concerned with ensuring that the project delivers the specified business benefits. P1 supports this view and highlights that one of the critical success factors related to successful execution is "continued and aggressive sponsorship", and they "must have the energy to spend least 5 hours per week on any strategic or significant projects". They should know the daily status of the project and sponsors must make timeous decisions. "King IV speaks about the courage of management to make the right decisions in a short space of time": P1.

P4 and P2 concur: "sponsors should be in a position to manage time, cost and quality based on intelligent analysis. Typically, the project sponsorship is lacking, delaying key decisions": P4 and "if you don't have strong sponsorship or management ownership with what you are busy with, then it can derail": P2.

The second common theme across all participants is that skilled, knowledgeable resources should be sourced to ensure delivery. This is aligned with Bloch et al. (2012) who propose the creation of high performance, multi-disciplinary teams. P4 indicated that one of the largest challenges with delivery is the "lack of project management knowledge. They should have sufficient information to prioritise tasks and make relevant decisions. They should be organic and fluid based on the circumstances e.g. people availability, issues experienced or other priorities".

P9 concurred – one of the core criteria for successful execution is the "skill capability, and for me, it is just about the people because people make the execution. The South Africa context and labour law challenges further expound the situation as the business climate is not really conducive to creating a highly capable workforce because the constraints are too big". This challenge can be circumvented by out-sourcing the delivery, however, concerns were raised that the logistics around this, e.g. funding or procurement vehicles, are sometimes lacking, further delaying execution. Furthermore, this is not to be seen as the panacea, given the overall skills constraints in South Africa.

The challenges and risks with time-boxing were noted, whereby an end implementation date is set without due consideration of the task complexity, interdependencies, activity duration or resource availability. This compromises the project delivery date. Alternatively, either the cost increases or the quality of the solution is compromised. P1 commented that delivery is compromised when there are: “management push time-boxed, aggressive timelines without rigorous interrogation of activity duration estimation and the subsequent risk”. This view was echoed by P9 who indicated that delivery challenges are linked to “predefined timelines for implementation without taking into account the resources to deliver against those timelines”.

The organisational ability to absorb the change brought about by the execution of the strategy must be carefully considered and planned. P1 advises that “you must have the management to own the product once it is delivered, and if not, you should reconsider the pace and the magnitude of what you are trying to push downstream into the organisation”. During project execution, a high focus is on delivering the technological components of the solution and in certain instances, insufficient time is allocated to change management. This is a critical component without which the value-add and sustainability of technology solutions are significantly reduced.

As documented in section 2: Literature Review: Application of Prior Research, Špundak (2014), Kerzner (2013) and Bloch et al. (2012) propose the use of project management methodologies to deliver successful projects. Perry (2009) however, argues that a methodology in itself fails to add value. In order to establish the value add of methodologies in practice, the participants were questioned which enabling frameworks they had personally used during project delivery and whether these had added value.

There was a unanimous view from all participants that methodologies do provide guidance and a checklist of items that can prevent basic tasks from being overlooked. However, one must be careful in using these where relevant and experiential knowledge is still required in order to effectively execute delivery. One should not follow a methodology merely to conform and tick all the boxes. Rather, the relevance of the deliverables of the framework should be clearly understood in terms of the contribution to successful project delivery and business value.

P1 supported the use of frameworks, such as PMBOK®, and indicated that the use of same would increase the probability of project delivery: “at least PMBOK® gives you a framework like a checklist that you can interrogate and action to provide you the assurance”. P2 and P4 were more cautious, communicating: “the puristic application of these frameworks in an information technology environment, I think is a bit of a pipe dream because you can apply PMBOK® to the letter of the law and still fail”: P2 and P4: PMBOK® “does not give you the experiential knowledge and subsequent insight into real problems that occur”. P8 further commented that frameworks “do not always understand the dynamics of a digital implementation, and do not necessarily cater for changing requirements as a software project goes along” which is more closely aligned with the views of Perry (2009).

P10 indicated that frameworks are important, but advised to “take the bits and pieces that really make sense on the project and make it your own”. A similar view was held by P3: “we have all been involved in methodologies that have been thousands of lines long and overtaken the project. Don’t generate paper for the sake of generating paper and forget the spirit of what you are trying to do”. P9 concurred: “the use of frameworks should be directly linked to business outcomes and then you will probably find 20%, 30% or 40% relevance, but you probably will not get 80% in any of them”.

Summary of Findings: Execution

The analysis of the interview material concluded that the participants viewed execution as the most important contributor to business value-add. One of the most interesting findings is that project management frameworks such as Prince2® or PMBOK® must be used with caution. Although they contribute to successful execution, project managers must be careful not to become slaves to the methodology at the expense of project delivery. Projects, by their very nature, are unique and hence the guidance provided by the methodologies should be adapted to the requirements of each project. The framework deliverables should contribute to the successful execution, with the focus on business outcomes, leveraging off experiential knowledge to use the methodologies effectively.

A causal analysis has been presented in Figure 10: Cause-effect Diagram: Execution, in summary of the success factors identified to derive business value.

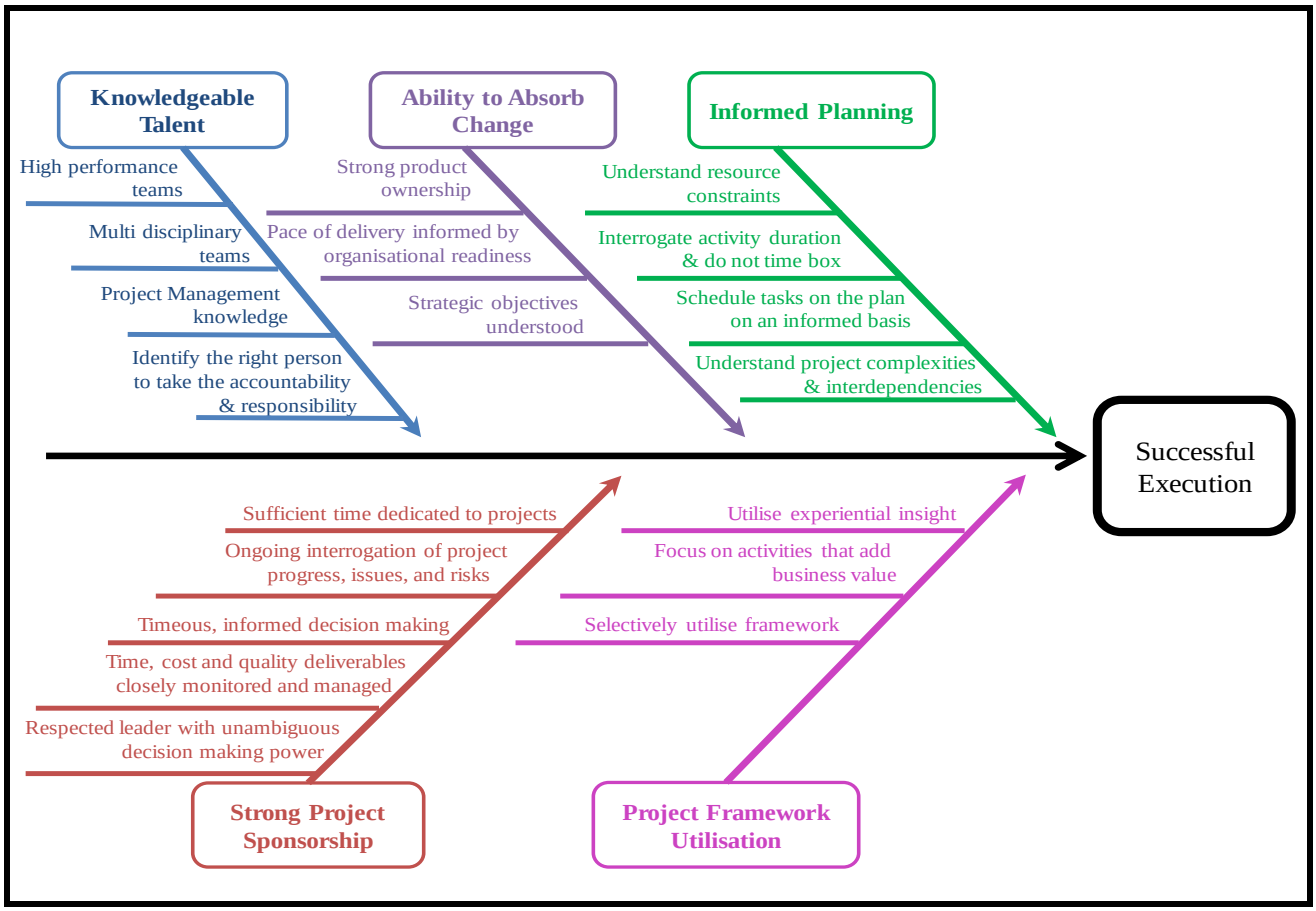


Figure 10: Cause-effect Diagram: Execution

Importance of Maintenance

Together with sustainability, maintenance rated the lowest importance when compared to the other IT component value-add. Maintenance scored an average of 3.8 out of 5, with a median of 4, as detailed in Figure 2: Importance of IT Components to Add Business Value. Two participants (P10 and P8) rated the importance as a 5. The reason for the high ranking was because “even if you have a brilliant strategy that is converted to brilliant execution, if you neglect maintenance, the value to the business after year one could fall flat and become a fruitless expenditure”: P8. P2 rated maintenance as 4.5: “you invest a lot of money to create, and generally when you do that, it is for the long run. IT is core to the business and if a core piece of your infrastructure is just not functioning anymore, it’ll impact you materially”.

Three participants rated maintenance 4, with a common theme that maintenance is “something that is fairly mature in the IT world”: P9 and although maintenance is hugely

important, “the value is not clear. It is clear on the negative side, but not on the positive side and it is treated as just business as usual”: P3. P9 supports this view, maintaining that the “business value of an IT upgrade is zero, but not doing maintenance can be catastrophic”.

Another reason for the lower importance of maintenance is the upcoming trend of cloud computing as discussed by P9. This means that the maintenance tasks are out-sourced, and become “less important from the business perspective, but becomes more important for someone else”. The value proposition is largely derived from the IT skills shortage, both locally and internationally. Many companies cannot attract or afford dedicated IT skills and it is “better to have one system expert, that really knows how it works, that can service ten customers, than having one mediocre resource in your own shop”: P9. P4 and P6 also attributed the lower ranking of 3 partly to cloud computing but did highlight the importance of diligent capacity management when moving to off-premise solutions. P1, rating maintenance at 3 believes that “maintenance is less of a concern because it is more predictable, it is repetitive, and there are rather impressive automated tools that can enable one to keep track of utilisation, reliability, usability, etc”.

One of the keys tasks that can add value is the ability to measure the outcome of the maintenance. A mechanism to prioritise critical components for maintenance is required, in terms of the value add and impact of non-availability. Some participants were of the opinion that organisations are too focused on saving money, and this philosophy is flawed, especially if business value can be derived.

An underlying theme is that a core set of very capable people are required, as held by Leopoldi (2016). This can inform decisions to outsource maintenance or move it to the cloud. P4 concurred: “if you want to optimise and get a return, you need experts and specialist skill. However, if you merely want to keep things running, the skill is not as important”. P10, who rated maintenance as a 5 justified that “it is not something that just happens. It must be managed proactively”.

As advocated by Leopoldi (2016), the relevance of ITIL and service management frameworks to successful maintenance was supported by P1, P3, P4 and P5. P5 stressed the importance of having a framework to reduce the reliance on individuals. Too seldom are lessons learnt through root cause analysis documented back into the ITSM/ ITIL framework. P1 highlighted

the routine nature of maintenance, making it easier to “leverage governance frameworks and methodologies to help assist you to monitor the maintenance cycle.”

Due to digitisation, the reach, impact and risk of technology is expanding. Whilst the frameworks were supported, it was iterated that organisations, enabled by IT, need to be increasingly agile to respond to consumer needs, whilst minimising the risk. P1 communicated that “often maintenance can be too rigorous and can hamper the ability of organisations to implement new thinking”. “There has to be a balance between keeping the lights on and implementing new technologies” as defined by the strategy and implemented in execution.

Similar to the framework section discussed in execution, participants were of the opinion that the framework is critical, “but must be done for the right reasons”: P3. “The toolset must not be implemented too literally and should be informed by the organisational culture”: P4.

P1 believes that a contributor to successful maintenance includes the investment in “necessary insurance mechanisms”, “having a maintenance plan with the Original Equipment Manufacturer (OEM) and to keep abreast in terms of hardware and software versions, and to have the necessary enterprise licence agreements and professional service support”. The necessity to “maintain sound working relationships with the vendor to ensure the best focus in order to resolve a problem when it occurs” was highlighted. This sentiment was echoed by P7 and further expounded to include the integrated nature and interdependencies of several participants in a business process.

P3 commented that “one of the things that organisations do ineffectively is manage their licences”. This is especially concerning due to the high percentage of organisational spend on software maintenance as highlighted by Lahtela and Jäntti (2010). P4 was of the same view that “very few organisations do licencing well”, and in order to be more effective, it requires dedicated focus and segregation of duties.

Maintenance needs to become increasingly predictive and preventative, with the associated proactive activities to ensure maximum system availability. This should be enabled by automated monitoring and where relevant, self-healing activities. The ability to scale capacity quickly via dynamic scaling and capacity management was highlighted as an area that is required but is currently not well managed. The move away from monolithic or distributed

data centres to the cloud was highlighted as a mechanism to facilitate rapid scaling but needs to be carefully controlled to prevent spiralling costs associated with capacity that is not utilised.

The demand for reliable and performant infrastructures designed to serve critical systems has necessitated the need for systems to become highly available. P8 comments: “ensure that technology is aligned with the business requirements in terms of uptime, availability, business continuity, in terms of a business process being available according to the business expectations”. The solution should be architected to meet these needs, focusing on critical components and technical integration that comprises the end to end solution. Single points of failure should be identified and eliminated as far as possible to prevent service interruptions.

Summary of Findings: Maintenance

Participants, on average, rated this category as the least important, when compared to the other IT components. This was primarily because maintenance is predictable and repetitive. This lends itself well to automated tools and monitoring to predict, prevent and enable proactive remediation. This area is mature and the frameworks such as ITSM and ITIL can be utilised effectively, provided that they are not implemented too rigidly, inhibiting agility.

The success factors to enable maintenance to add business value have been summarised in Figure 11: Cause-effect Diagram: Maintenance.

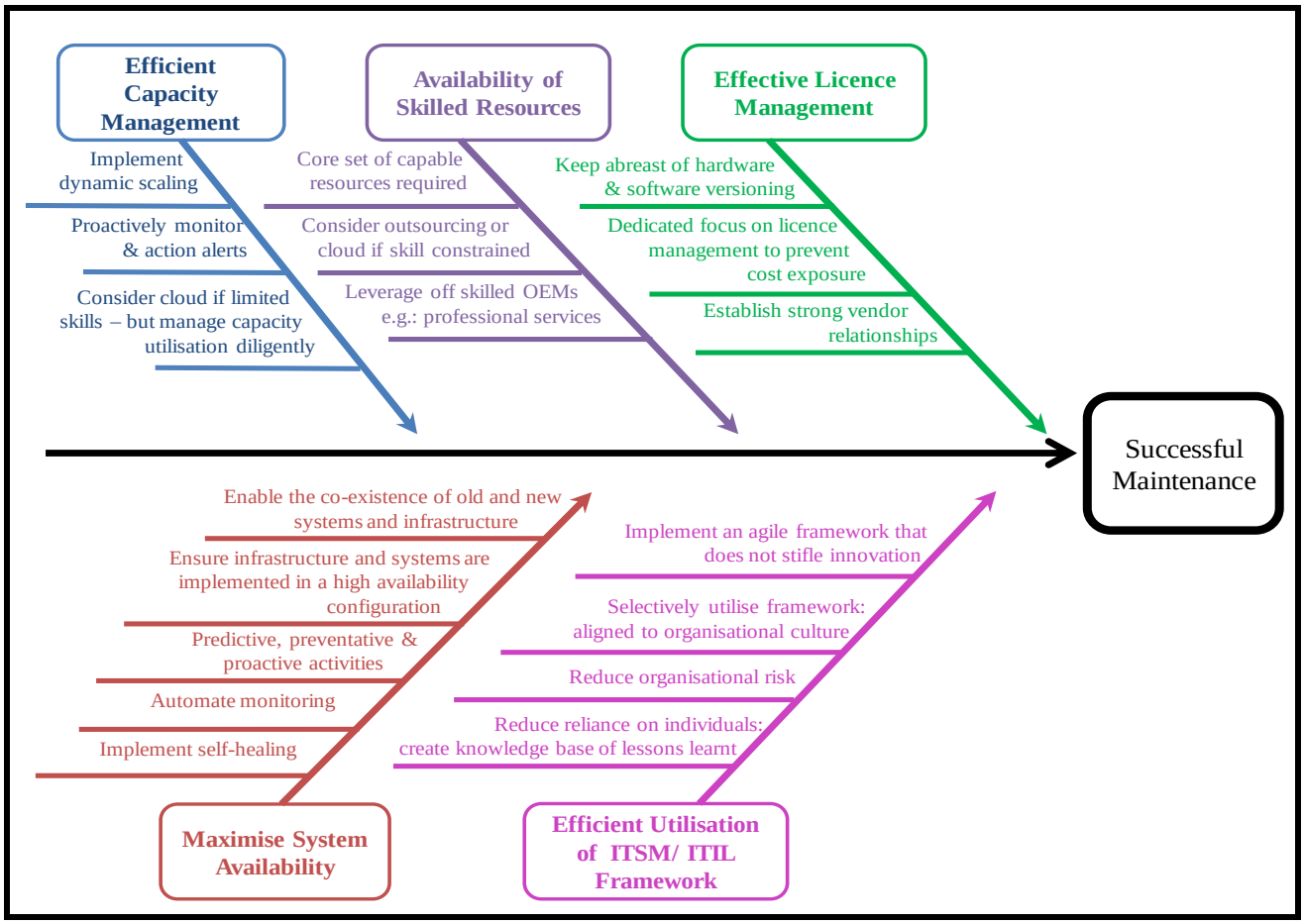


Figure 11: Cause-effect Diagram: Maintenance

Importance of Sustainability

The application of prior research conveyed the significance of sustainability, Schwalbe (2015) reports that studies conducted by the Project Management Institute show that thirty-nine percent of high performing organisations track benefits, compared to nine percent of low performers.

The data gathered from participants during the interview process rated sustainability with an average of 3.9 and a median of 4. This, along with execution, was deemed the least important category. P3 justified the low importance rating as: “It is one of those areas - it doesn’t break if you don’t do it. If you don’t invest in sustainability, the implications of it take time to bubble up”. P1 commented: “if you do maintenance correctly, you already see a carry through into the sustainability of the organisation because you introduce stability and reliability”.

Notwithstanding the low rating of importance, all participants unanimously agreed that organisations spent insufficient time on sustainability. P8 indicated that if sustainability is not considered, “this thing will not be kept going for the defined period and the value will not be reached. If we are not sustainable, we will have to redesign all the time”, resulting in fruitless expenditure. “In an effort to chase the bottom line, sustainability is left out and you shoot yourself in the foot”: P5.

“Some organisations are realising the immense cost that they incur on maintenance – and it is not cost effective anymore. Organisations need to find ways to make solutions more cost effective, more uptime and do it with less people”: P10. The association between the value stream technology enablers and the associated cost must be clearly defined to ensure informed decisions are made. Expensive technological components or applications that add limited value to the business process are prime candidates for replacement or retirement.

P3 communicated that improved sustainability results in strengthened relationships between IT and business. If the value of IT is exposed to business, they will be increasingly supportive: “both on projects that IT wants to do as well as obviously the projects that they want as well”.

Data and volumetrics emanating from the maintenance phase are key enablers of sustainability – factual data analytics should inform the value measurement and in turn, the data driven approach informs the strategy. P1 and P10 concurred: The real time or near real time data also informs organisations. Thinking about the insurance base and how quickly they get information about clients that leave them, clients that re-subscribe. They analyse the data to inform the product offerings.” This is aligned with Section 2: Application of Prior Research: data provides insight to continuously learn and improve the process and performance (Chen et al., 2012; Laursen & Thorlund, 2016; Lenssen et al., 2013; Lim et al., 2013).

Segregation of thinking and duties across the maintenance and sustainability is proposed such that maintenance can focus on reliability and maintainability. “Organisations need to better measure the value of what they do. You need to make people accountable for it”: P3.

The cost containment and ability to scan the marketplace on a continuous basis, as part of sustainability, is of paramount importance. P1 highlights the need to “think creatively about your cost structures and understand the impact of the external environment e.g.: a weak local

currency and the fact that you need to make investments in a dollar based denomination". Furthermore, Moore's Law, which implies that computing power is doubling in performance every couple of years and is getting faster and cheaper, is a large influence in the sustainability component and will impact "the cost to turnover ratio": P1. This view is synonymous with Chen et al. (2012) and Kou et al. (2014) who advocate that organisations need to manage risks via understanding their business and markets.

The dynamic and disruptive nature of IT necessitates on-going assessment – "windows are narrowing of what you can get away with for how long": P7. Organisations need to be in a cycle of "continuous deployment of innovation, constantly training, incrementally improving. You are either on that wave or you are left behind". The consideration of the coexistence of new technologies in the context of your existing technology needs to be understood and architected.

The longevity of technology decisions was emphasised, directly impacting sustainability. "Technology decisions that you take today can serve the organisation for a decade. Nowadays the introduction of technology is complex. So it is not a trivial decision. No technology decision that you take actually has a shorter lifespan than a decade". "The focus on sustainability justifies the right decisions": P1. P9, however, challenged this view by indicating that the "five-year view of IT is already flawed. We need to get to three years". P10 concurred: "We are seeing a lot more projects across the board that are no longer multi-year projects or initiates. They tend to be short, make sure that you can maintain. Make sure that they are sustainable. This could be a result of disruptive technologies, or of the product that you sell. You need to come up with a new idea and very quickly".

P4 said that the sustainability is compromised by decisions that are not properly informed "and happen off the cuff". Improved feasibility studies are required with a focus on sustainability, underpinned by governance.

P8 highlighted that organisations need to "learn from our mistakes – it should teach us what does not work". "The lessons learnt from things that are not sustainable need to feed back into the strategy". "We tried the strategy – it was not sustainable – so we should do it in a different way or not make it part of the strategy going forward". A thorough understanding of the organisational SWOT: strengths, weaknesses, opportunities and threats inform the sustainability.

The sustainability informs the strategy – it is seldom that organisations can implement blue sky thinking from end to end. “There has to be a reality check in terms of time to implement, deciding the priorities and often that is informed from a sustainability perspective”: P3.

P10 stressed the importance of continuous evaluation as proposed by Tallon et al. (2000). “So you may go and re-visit certain things after a period of time and say that was my strategy, we implemented successfully, but things have moved on, and now there are better, more cost effective ways of doing it”.

Summary of Findings: Sustainability

Participants, on average, rated this category, together with maintenance, as the least important, although it was unanimous that more time should be spent on this component. In order to survive, organisations need to leverage off data to make informed decisions. Solutions need to be implemented that add value, more cost effectively.

The success factors to enable sustainability to add business value have been summarised in Figure 12: Cause-effect Diagram: Sustainability.

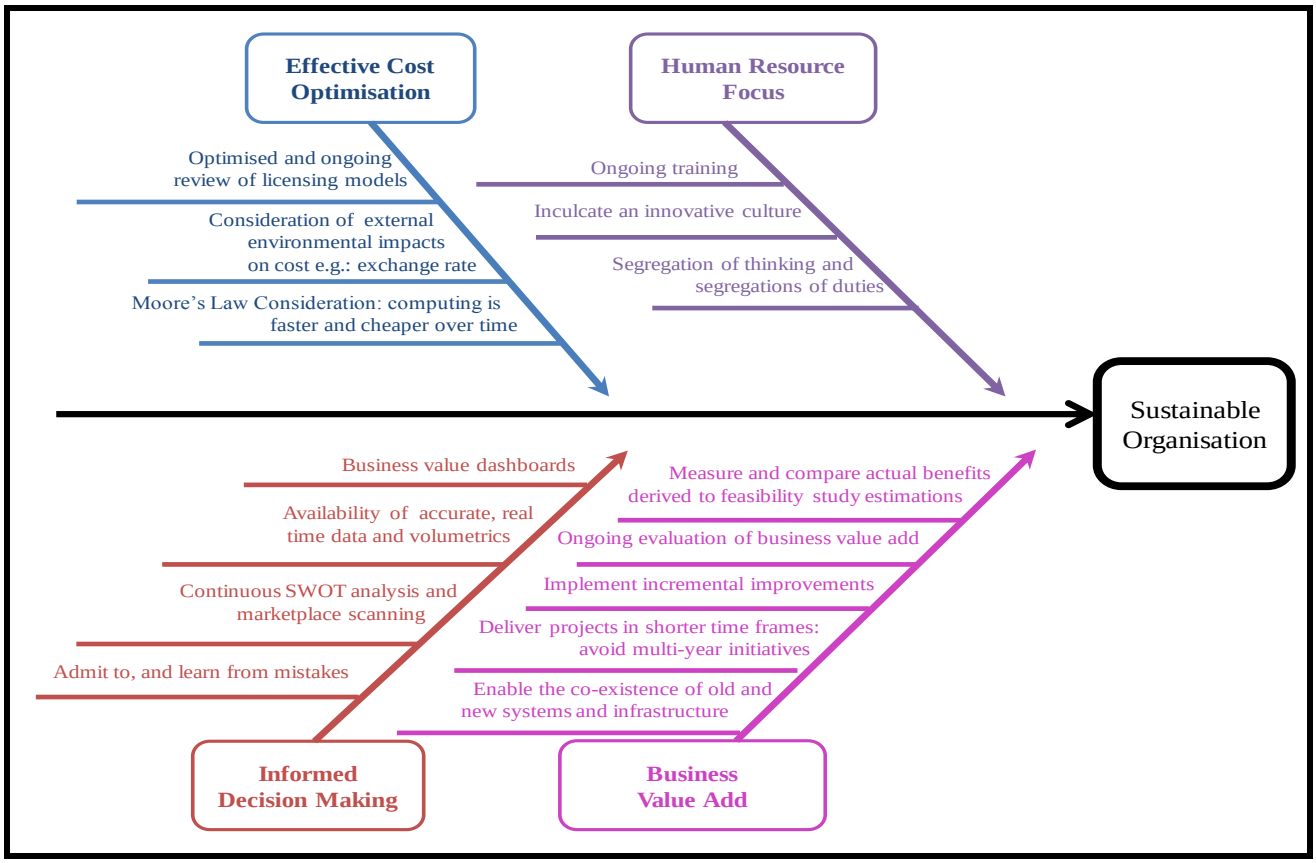


Figure 12: Cause-effect Diagram: Sustainability

Importance of Governance

Governance and the associated enabling frameworks are intended to increase the accountability of organisations and pro-actively identify and eliminate problems to avoid massive disasters. Governance can mitigate risk, keep companies honest, prevent scandals, fraud and organisational civil and criminal liability. P8 indicated that it is a “mechanism to have traceability to ensure that value is derived”.

Participants interviewed rated the importance of governance at an average of 4.3 and a median of 4. Governance thus ranked behind strategy and execution, the primary reason is that “organisations should not be too focused on governance to the detriment of innovation”: P7.

Concern was raised that if governance is taken too literally, the associated bureaucracy can result in inflexibility. P8 stressed that “governance is not about the whip, and if you don’t do things you should be penalised.” The view was rather that governance should focus on stakeholder value throughout the process.

As referred to in the themes above, where enabling frameworks were discussed, there was common consent that governance ‘bodies of knowledge’ should be used where applicable. They should be implemented and adapted to the particular organisation. “The organisation must use them in context”: P8. P6 explained that the biggest challenge is “not to bury yourself in governance. Governance becomes so complicated that it becomes impossible to implement. So one must know when to stop and say: this is good enough”. P9 and P10 concurred: “there must be just enough governance and it must be aligned to value”: P9 and P10: “Governance must focus on the right stuff. If governance is focused on the wrong or non-important items, it adds zero value”. P2 expressed that there are “various levels of governance to make sure that you identify the correct things, that you follow the correct processes, that you don’t jeopardise or put people at risk”.

“A lot of people see governance as a handbrake, but it can be used to do the right thing. Many system problems arise because of the lack of governance. If governance is adhered to, it can prevent issues down the line”: P4.

Management talent is a key enabler to ensure that governance is instituted and practically applied to maximise the value add. P1 stated that “management discretion must be used”, “there should be sufficient governance, but well understood and inculcated in management controls that are built into the execution of each line manager’s daily job. Leadership is of paramount importance to make sure that governance actually happens”. “Governance must be executable in every element of the business”: P7.

The management controls are well defined in COBIT® and ITIL frameworks: “so it is pretty much a recipe book that you can follow”: P1. It should be used with caution to ensure that the focus remains on using the framework as an enabler and does not become all-consuming to the detriment of the strategic vision and execution. “What is more important is not to have an obsession and to become too hung up on the form. The substance is more important”: P1. P8 agreed and cautioned that “they should not be implemented verbatim. Although they may still add value, you may spend significant time and effort to implement, that could have been better spent in business value adding activities”. P2 held a similar view: “it can become a debilitating factor. Do all the paper work and just don’t get to do the work”. The frameworks must thus promote stakeholder value add, as intended by Cobit®: which facilitates the identification of stakeholder drivers, needs, enterprise goals which are translated into IT related goals and enablers (ISACA, 2012; Kulkarni, 2017).

Summary of Findings: Governance

The correct level of governance was deemed important to mitigate risk, increase accountability, protect the organisational image and to ensure that the stakeholder needs are met. The use of the governance and the enabling frameworks must however, be tailored to the organisation and must enable, rather than hinder, business value add.

The success factors to enable governance to add business value have been summarised in Figure 13: Cause-effect Diagram: Governance.

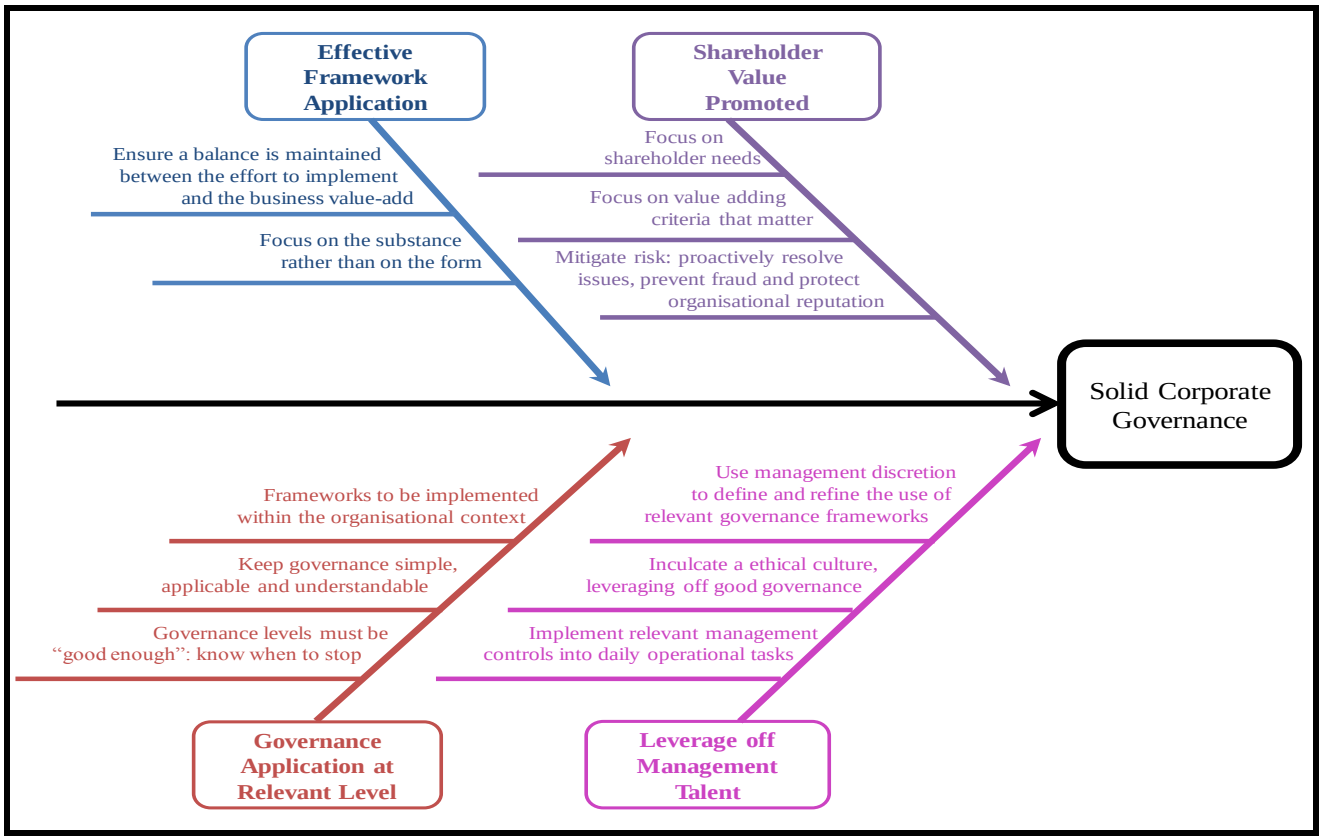


Figure 13: Cause-effect Diagram: Governance

Importance of IT to Business

Section 1: Context of the Study documented the importance of IT to organisational survival and success. Technology drives innovation and creates unprecedented growth and valuation (Edelman Trust Barometer, 2017). The King IV report emphasises that technology is no longer merely an enabler to business, but is the platform to leverage future business opportunities (Institute of Directors, 2016). This was corroborated by all participants. P2 indicated: "we are living in an information society. The bulk of what we do, irrespective if it's a service organisation, a fast moving goods organisation or whether it's a manufacturing outfit, is dependent on information technology to have their businesses run". P6 articulated that IT is "no longer a competitive advantage - it is a bare minimum entry point to operate". P3 concurred with the view and said that "organisations that are treating IT as a back office are very likely, especially in the private sector world, to lose market share and possibly be completely obsolete in 5 to 7 years. So IT is no longer just about supporting the business. In many ways, IT actually is the business".

Technology is not about technology alone, it is about how technology can add value. It is about discovering how technology can be leveraged. It aims to discover more efficient methods and processes. IT is driving innovation which is the path to business success. This is aligned with the views as detailed by the Edelman Trust Barometer (2017): IT drives a large percentage of the world's greatest inventions.

IT has provided business with tools to solve complex problems and has facilitated better decision making via the provision of real time data. "As soon as products are consumed, you see the revenue and can make immediate decisions about marketing campaigns. You can get information exactly on a day to day basis what customers are doing. That is the real time experience of engaging": P7, which is consistent with Cambria et al. (2013). Improved marketing has been enabled via IT through the identification of needs and target markets, and customer support has been enhanced via the establishment of multiple communication channels.

Technology has become synonymous with business success, which was supported by P6: "No organisation can exist without some element of technology". Companies are doing everything in their power to get an edge, to outpace their competitors. Without it, they will fall behind. This trend where technology will shape the future is set to continue as communicated by P8: "Organisations cannot live without IT and it will get worse in the future".

Participants accentuated the key role that leadership plays in order to derive business value from IT. P5 commented: "if you do not have good leadership, you are doomed". The organisation should be designed on team based principles, with clearly defined responsibilities. P8 indicated that "the leader must create high performing teams". This is aligned with the findings in Section 2 Literature Review: Application of Prior Research. Leaders need to encourage collaboration, knowledge sharing and learning should be utilising agile networks (Bersin et al., 2017). The leader should establish an organisational design that inculcates a culture of innovation and risk taking. P10 commented: "Leadership needs the ability to pull the right people together, influence the right people, sell the right story, tell the right story. So the leader is critical – without that, you won't see a lot of things happening".

CONCLUSION

The purpose of this section is to summarise the main findings of the research. Recommendations are made to those involved with IT investment and management decisions such as Chief Executive Officers, Chief Information Officers or Chief Data Officers. Lastly, suggestions for future research are made.

The importance of IT in a world that is becoming increasingly digitally enabled is irrefutable. Organisations that fail to embrace technology and maximise the value derived therefrom, will fall behind competitors and it will be a matter of time before they go out of business.

Based on the research findings, in order to maximise business value-add, organisations are advised to concentrate their efforts on the components of execution and strategy, followed by governance and finally, on maintenance and sustainability. For organisations to survive and prosper in a changing technological world, the importance of leadership and the establishment of an enabling culture and conducive environment for learning and innovation is imperative. The research findings of business value derived from IT is summarised in Figure 14 below.

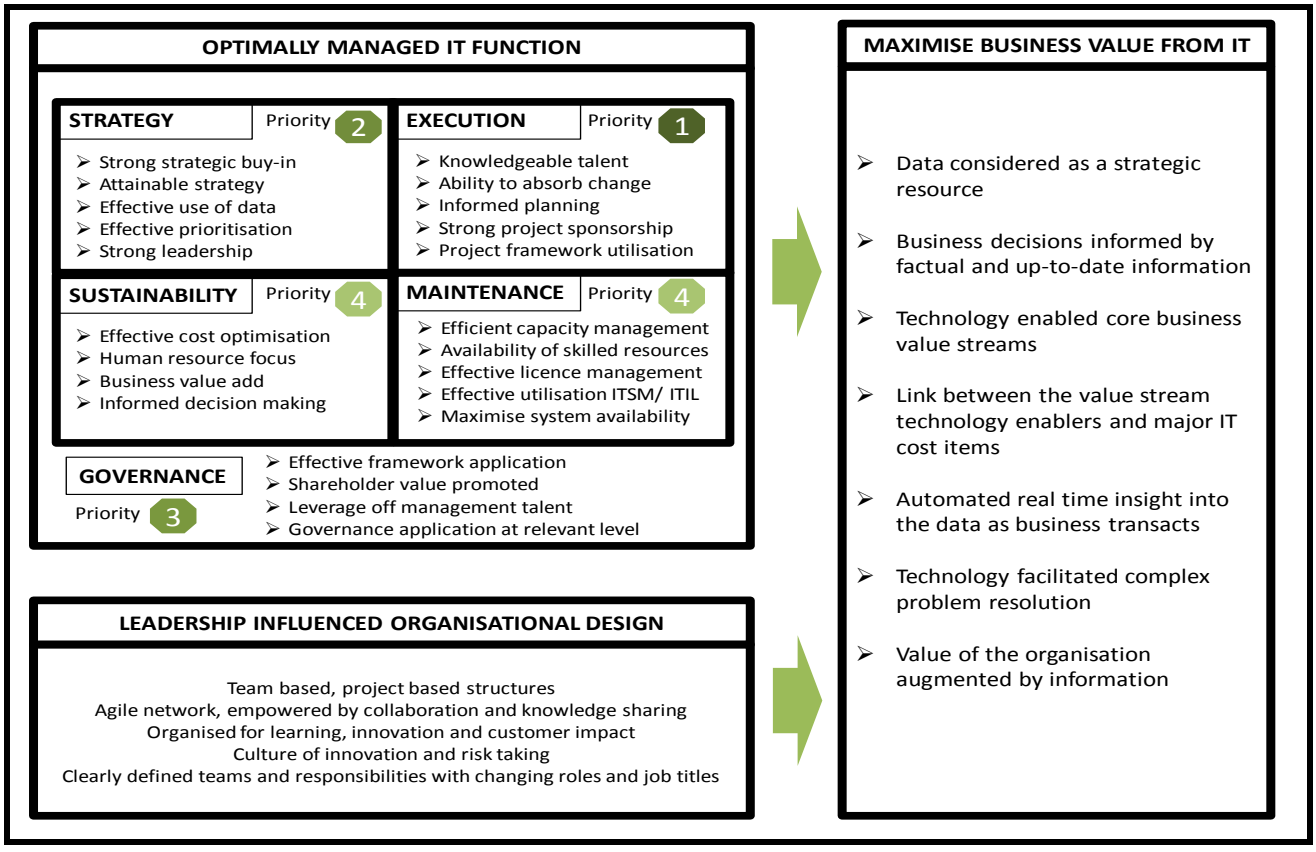


Figure 14: Business Value Derived from IT

Suggestions for Further Research

Strategy is rated of the highest importance contributing to business value. However, the research conducted suggests that there is dissent whether business strategy drives IT or vice versa. It would thus be enlightening to study this topic in detail and to extend the participation to include business representatives. Further delving into the ramifications of the disparate views, and the change over time of corporate socio-dynamics and the impact of future strategic decision makers become increasingly digitally fluent.

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APPENDIX 1: RESEARCH QUESTIONNAIRE

Thank you for agreeing to participate in this study. Your participation is voluntary and should you feel uncomfortable you are welcome to stop the interview at any stage. Do you have any objections if I record the session?

The purpose of this study is to establish the key components comprising Information Technology (IT). The enabling response mechanisms and best practices per area will be explored. The aim is to provide recommendations and pragmatic guidance to improve the efficiency and effectiveness of IT to deliver organisational value.

GENERAL

1. Tell me about your background in Information Technology

IMPORTANCE OF IT IN THE ORGANISATION

2. What is the importance of IT to an organisation?

KEY COMPONENTS OF IT

3. Based on research I have drafted a quadrant of the fundamental IT components that add value to the business. These include strategy, execution, maintenance and sustainability. All these components are framed by sound governance.
4. Do you believe that there are other components that contribute to IT value delivery?
5. For each of the dimensions, components or functions, (as provided in question 1 above), please provide a rating on a scale of 1 – 5 in terms of importance in business value add where 1 is not important and 5 is very important.

STRATEGY

6. You rated strategy as X, can you explain the reasoning for this rating?
7. Do you believe IT should drive business strategy or vice versa?
8. What are the main considerations and success factors in setting the strategic direction to ensure IT value add?
9. What usually informs the strategy?

EXECUTION

10. You rated execution as X, can you explain the reasoning for this rating?
11. What do you believe are the key criteria for prioritising the delivery of IT projects? Do you think that sufficient time is spent on aligning project delivery to value?
12. What challenges are typically experienced within the project delivery area in terms of value add?
13. Which enabling mechanisms or frameworks can be used to optimise project delivery and are these focussed on adding value?
14. Have these frameworks facilitated successful delivery of IT projects and if so, how?
15. In your experience, do organisations have a formal mechanism or metrics to measure and track IT value alignment?

MAINTENANCE

16. You rated the importance of maintenance as X, can you explain the reasoning for this rating?
17. What are the critical components or typical tasks that are undertaken to maintain IT to ensure ongoing value add?
18. Which enabling mechanisms or frameworks can be used to optimise maintenance and ensure value add?
19. Have these assisted the effectiveness and efficiency of IT operations, and in what manner?

SUSTAINABILITY

20. You rated the importance of sustainability as X, can you explain the reasoning for this rating?
21. Do you believe that sustainability informs the strategy and if so, how?
22. In your opinion, do most organisations focus sufficiently on sustainability?
23. How do you think that an organisation can ensure sustainability?

GOVERNANCE

24. You rated the importance of sustainability as X, can you explain the reasoning for this rating?
25. What best practices or frameworks can ensure compliance and enforce good governance?
26. Do you believe governance is important and if so why?

Thank you for your time and participation.