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1.1 INTRODUCTION

This chapter sets the context for the study. It discusses the challenges experienced by organisations in the current business context and illustrates the problem statement that the study aims to investigate. It further presents the research questions, limitations and assumptions set out for this study. It concludes with the chapter outline for subsequent chapters.

1.2 BACKGROUND

Amid increased globalisation, technological innovation and changing social trends, the current environmental context within which organisations interact is facing increasing instability (Eisenhardt, Furr, & Bingham, 2010:1263). Advances in technological innovation are the largest contributor to this instability and are constantly revolutionising the manner in which organisations operate (Barba-Sanchez, Martine-Ruiz, & Jimenez-Zarco, 2007:105). In order to achieve pursued advantage and ultimately sustain their survival, organisations are under extreme pressure to change or adapt quickly to their environments. Organisations in the current business context need to be strategically flexible and agile while being cost effective (Bryan, 2002:18; Drejer, 2004:511).

Information and communications technology (ICT) plays an enormous role in business today and, as such, there is little disagreement about its strategic business importance (Bakos & Treacy, 1986:107; Adner, 2004:25; Lopez-Nicolas & Soto-Acosta, 2010:521). Organisations should ideally align their information technology strategies and their business strategies for optimal performance. However, with the rapid pace of technology advancement it is becoming difficult to keep abreast of the latest trends in order to align business and ICT strategies sufficiently.

Technological advancement plays a pivotal role in determining market success and, as such, organisations have increased their adoption of sophisticated technologies (Zahra & Covin, 1993:451; Sieber & Valor, 2008:14). Technology adoption serves as a vehicle that allows management to participate in a world of constant innovation with strategic benefits.

However, in today's world of increased uncertainty, globalisation, rapid pace of advancement in ICT and changing social trends, management has to be flexible and adaptable in *crafting* strategies (Graetz, 2000:550).

Given the current environmental context of instability, traditional approaches to strategising are less effective (Chakravarthy, 1997:69; Courtney, 2001:38). In view of the increased levels of uncertainty within which organisations interact, managers require a new approach to strategising (Courtney, Kirkland, Viguerie, 1997:79). Managers operating in complex environments have to face numerous strategic issues (Elter, 2004:3). It is of crucial importance that management has an understanding of the factors that can influence the adoption of new ICT (Sultan & Chan, 2000:106). For managers to select a particular technology that addresses a particular strategic need, they need to understand the day-to-day activities of the organisation.

A new paradigm to strategising gave rise to the strategy-as-practice (s-as-p) approach, which depicts strategising as an activity of strategy by both organisations and people. Jarzabkowski, Balogun and Seidl (2007:8) refer to strategising as the 'doing of strategy'. Strategising from an s-as-p perspective encompasses the nexus between praxis, practices and practitioners. In order to better understand what is involved in strategising one has to focus on all three areas of s-as-p. It is within this framework that the study will focus on how strategising responds to ICT adoption.

Although research has been conducted on activities involved in strategising from an s-as-p perspective, little is known about what strategists do in their day-to-day work (Whittington, 2002:c5). Johnson, Melin, and Whittington (2003:16) suggest that for future research on activity-based views, focus should be given to 'the effectiveness of practices and practitioners in more immediate terms'. Jarzabkowski and Spee (2009:74) have developed a topology of the nine domains for s-as-p research that supports the fact that s-as-p is a relatively new field and that little literature is available on the micro-activities of the actual work of strategising and how these activities respond to ICT adoption. This study intends to enhance the s-as-p research in domain 'D' of the above-mentioned topology by providing empirical findings on the strategising activities of ICT adoption by practitioners in

the case organisation and inform the s-as-p body of knowledge on how these activities may contribute towards strategy-making.

An extensive search of leading electronic journal databases, including EBSCOHost, Emerald, Google Scholar and Proquest ScienceDirect, suggest that little academic research has examined the relationship between strategising and ICT adoption. Kaplan and Jarzabkowski (2006) have attempted to explore how strategic tools are used in practice but limited the focus of their research to 'bubble charts' and the 'BEST' tool. Whittington, Molloy, Mayer and Smith (2006) have also provided some literature on the practices of strategising but limited their focus to just three types of practices. In an extensive analysis performed by Vaara & Whittington (2012) on all current s-as-p research, it is evident that no specific research has been undertaken in the field that investigates the relationship between activities of strategising and ICT adoption.

1.3 PROBLEM STATEMENT

S-as-p focuses on the 'doing' of strategy and aims to better understand the activities that management performs when strategising. S-as-p provides the framework within which the micro-activities of strategising are explored in detail and aids in determining how these activities shape technology adoption decisions. Figure 1-1 highlights the framework that was the outcome of this study.

Although the framework in Figure 1-1 is in part the outcome of this study, it is presented at this early juncture of the study to frame this research for the reader and to aid in understanding this study better. In order to understand the micro-activities, practices and decisions of ICT adoption that shape strategy, it is necessary to understand the factors that influence ICT adoption. The factors of ICT adoption listed in Figure 1-1 are the outcome of research on ICT adoption factors. The inventory of articles examined for these factors is presented in Table 5-2. The elements of 'strategising' presented in the framework are the study's key focus areas, which are used to examine the adoption activities of the case organisation from an s-as-p perspective. The strategising elements were selected for two reasons namely to confine the focus of the study and to analyse the

-4-

activities of ICT adoption practices, -contextual influences, - decision-making styles, -tools used, -factors influencing and – priorities involved in strategising for ICT adoption by the case organisation, activities that shape strategy.

Figure 1-1: Framework for factors influencing decision-making for ICT adoption
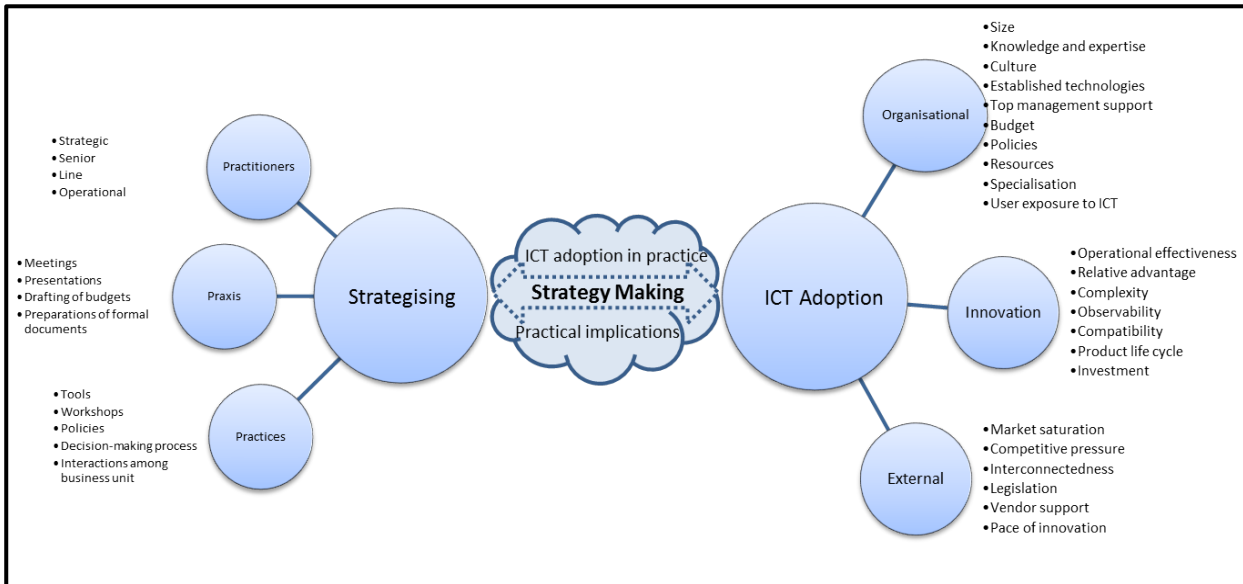
Source: Own compilation.

The adoption of innovative technology does pose challenges for managers in:

- understanding that the demand on management's strategising ability as a result of technology innovation is changing;
- understanding the practical implications of decision-making for ICT adoption;
- identifying the factors that contribute towards ICT adoption; and
- realising the priorities placed on ICT adoption, as viewed by different levels of management.

Although s-as-p research has contributed to literature on strategy practices and praxis, there is little empirical literature available in understanding the s-as-p response to ICT adoption by management in the contemporary business context. It therefore makes sense that research needs to be undertaken to determine the s-as-p response to ICT adoption and strategising by management in the contemporary context.

Thus, the impetus for this research study is to determine *how strategising for ICT happens in practice.* In the context of the research study, Figure 1-2 graphically depicts the critical aspects that influence the activities of strategising in the context of this study.

Figure 1-2: Problem statement: to determine how strategising happens in practise
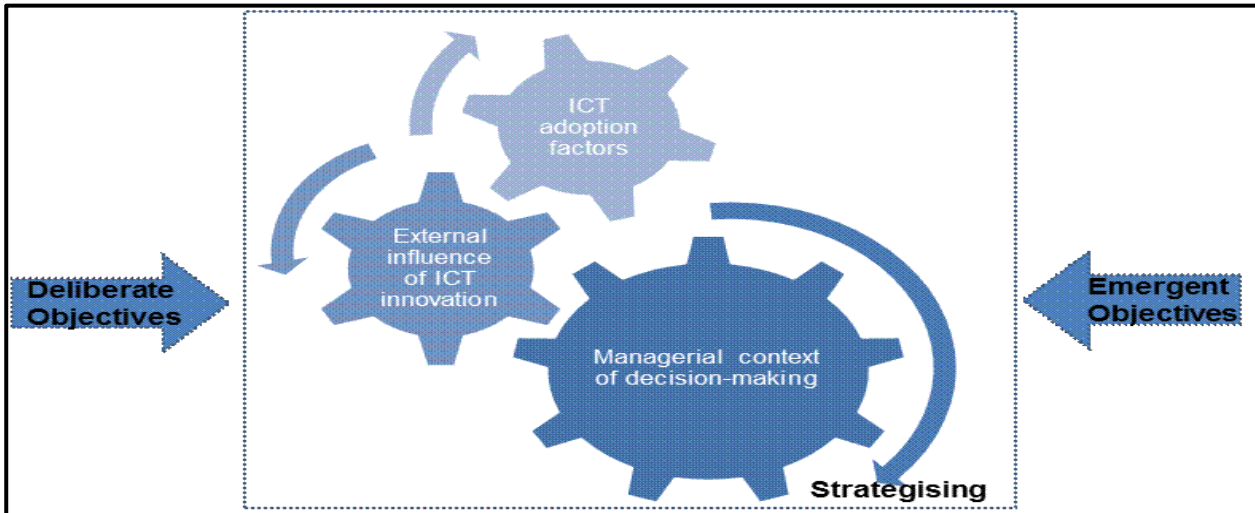
1.4   PURPOSE STATEMENT

The case study was conducted within a South African organisation with individuals who are in a position to make or influence strategic decisions, with a focus on strategising and how these activities respond to ICT adoption. The main aim of the study is to determine the manner in which strategising for ICT adoption occurs within the case organisation. The study thus aims to gain a better understanding of the day-to-day activities involved in the process of strategising for ICT adoption by management, from an s-as-p perspective.

1.5   FOUR PAPER APPROACH

Using grounded theory principles, literature articles relating to strategising, strategy, management in the modern business context and factors relating to ICT adoption were examined with the purpose of identifying categories of relevance for the design of the questionnaire. Paper 1 (Chapter 5), reports on the outcome of this qualitative research on

ICT adoption factors. Informal discussions, personal knowledge as an employee and observations of the case organisation provided additional support for the information gathered from literature. The questionnaire was designed using both the s-as-p elements and ICT adoption factors depicted in Figure 1-1. Papers 2, 3 and 4 report on the empirical findings based on the key focus areas of this study and is presented as four independent but interrelated papers. Figure 1-3 graphically depicts the design of the questionnaire and the outcome of the four papers presented in this study.

Figure 1-3: Questionnaire design
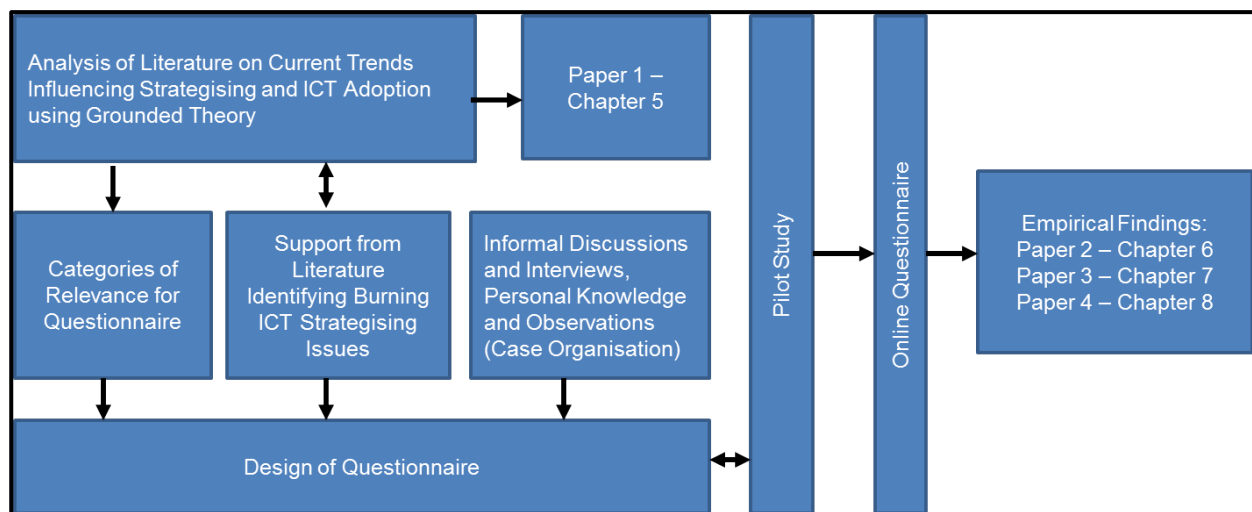
Table 1-1 illustrates the key research question for each paper as presented in Chapters 5 to 8. These questions set the context for each paper. Section 1.5 of this study lists the sub-questions that are collectively addressed in all four papers. The sub-questions assists in exploring the focus areas of the papers in detail and aid in adequately addressing the key questions identified in Table 1-1.

Table 1-1: Research questions of the four papers

Paper number	Research question
Paper 1 (Chapter 5)	What are the ICT adoption factors that shape decisions in the contemporary business environment?
Paper 2 (Chapter 6)	What are the ICT adoption drivers and inhibitors that can potentially influence strategic objectives in the context of the case organisation?
Paper 3 (Chapter 7)	What are the practical implications of decision-making for ICT adoption?
Paper 4	What are the priorities placed on ICT adoption factors, as viewed by the

Paper number	Research question
(Chapter 8)	different levels of management?

1.6   RESEARCH QUESTIONS FOR THIS OVERALL STUDY

In an attempt to answer this study's research problem, key questions were identified, which are listed in Table 1-1. These questions are further divided into sub-questions, which are addressed in the four papers. The study, from an s-as-p approach, is guided by the following research sub-questions:

- Is ICT adoption a choice for management?
- Are management roles evolving in response to their business environment?
- How does strategising for ICT adoption happen in practice?
- What are the factors that influence ICT adoption?
- What are the organisational ICT adoption drivers?
- What are the organisational ICT adoption inhibitors?
- Does job function contribute towards ICT adoption decisions?
- Does level of education influence decision-making for ICT adoption?
- Are ICT adoption factors influenced by level of management?
- Does pace of innovation influence management to adopt innovative technology sooner?

1.7   ACADEMIC VALUE AND CONTRIBUTION OF THIS STUDY

The study contributes both theoretically and practically towards academic literature. From a theoretical perspective, the study expands on the existing s-as-p knowledge base in the following ways:

- firstly, unlike previous attempts, which focused only on 'praxis' or 'practices', the study provides a more holistic view of 'strategising', including all three aspects of strategising, namely the practitioner, the practices and praxis of strategy; and

- secondly, it is known that technology is munificent but how does it influence the process of strategising? As far as could be determined at its initiation, this is the first study that examines the relationship of ICT adoption and strategising from an s-as-p perspective.

Research proves that little literature is available on the micro-activities of strategising, thus from a practical perspective the study makes a unique contribution by investigating the different styles and techniques involved in the micro-activities of strategising by the different levels of management.

The imperative of the research and its contribution towards the existing body of knowledge is further supported by Orlikowski (2000:423) who suggests that future research should be undertaken on technology adoption to better understand their 'intended and unintended' consequences in different situations. Also, 'If we want to move management research into the fast paced, competitive arena of the twenty-first century, we have to generate more research topics from within the organisation' (Balogun, Sigismund, & Johnson, 2003:220).

1.8 LIMITATIONS

The study has several limitations related to the context, constructs and theoretical perspectives of the study.

Firstly, it focuses on the context of the s-as-p perspective of strategising and mainly addresses the micro-activities of the different levels of management involved in ICT decision-making. All other practitioners and macro-activities fall outside the scope of study. The study only considers activities focusing on the 'doing of strategy'; all other activities fall outside the scope of this study. In addition, this study centres on strategising which is a goal of strategy and touches on competitive advantage, but does not explore the details of competitive advantage.

Secondly, the study focuses on ICT adoption and specifically on critical aspects of the technology life cycle that is of importance to the study. It does not look at the details of

innovation or the development of technology. Similarly, it does not focus on the development of software or the alternatives of software development, for example in-house, outsource or co-source. Nor does it focus on the diffusion of ICT within the organisation.

Finally, the study's specific focus concentrates on how strategising responds to ICT adoption within the case organisation. It does not focus on related organisations in the given industry nor are comparisons of the findings done on industry-similar organisations.

1.9   ASSUMPTIONS

An assumption is 'a condition that is taken for granted, without which the research project would be pointless' (Leedy & Ormrod, 2010:6). Several basic assumptions underlie the research study. As such, it is assumed that:

- the case organisation is 'similar to related organisations in the banking industry in that the circumstances and conditions of everyday situations are commonplace;

- the case organisation provides some 'revelatory' insight in that it presents an opportunity to observe and analyse a prevalent phenomenon; and

- as a result of the two assumptions above, when the case organisation is measured, it is possible to generalise the empirical findings in the banking industry. However, it was not the intention of this study to identify generalisable findings therefore further research need to be undertaken to determine the degree to which this is possible.

1.10 DEFINITIONS AND ABBREVIATIONS OF KEY TERMS

This study involves a number of key concepts and abbreviations. The definitions of key terms used in this study are listed in Table 1-2. Table 1-3 contains the list of abbreviations.

Table 1-2: Definition of key terms

Concept/construct	Meaning
Agility	Refers to the capability to quickly sense and respond to environmental perturbations.
Chi-square test	Commonly used to compare observed data with data we would expect to obtain according to a specific hypothesis.
Cronbach's alpha	It is commonly used as an estimate of the reliability of a psychometric test for a sample of examinees.
Decision drivers	Positive factors that provide the impetus to adopt technology.
Decision inhibitors	ICT barriers that delay or thwart its adoption.
Deliberate strategies	Those strategies that are planned and developed by top management and whose *objective* is known upfront.
Disruptive technology	A new technology that unexpectedly displaces an established technology.
Drivers	Viewed as a resource, process or condition that is essential for the sustained success and development of the organisation.
Emergent strategies	Strategies that emerge from the changing external environment. The objectives of these strategies are unknown upfront.
Established technology	Implemented technologies that are diffused and stabilised within the organisation.
Hyperconnectivity	The state of being constantly connected to people and systems through devices such as smartphones, tablets and computers, and sometimes through software that enables and promotes constant communication.
Information technology (IT) and information and communications technology (ICT) (are *used interchangeably in the study)*	IT is a set of tools, processes, methodologies and associated equipment employed to collect, process and present information. IT is an umbrella term that also encompasses ICT which focuses primarily on communication technologies, thus ICT includes technologies such as desktop and laptop computers, software, peripherals and connections to the Internet that are intended to fulfil information processing and communications functions.
Information technology strategy	Refers to the 'prioritising and selection of IT projects based on their benefits and added value for the organisation'.
Kruskal–Wallis test	One-way analysis of variance by ranks.
Normal Blom Transformation	Computes scores so that the resulting variables appear normally distributed.
Organisational readiness	Internal aspects that set the tone for ICT adoption.
Pace of innovation	Rate (innovative) and speed (timing of release) at which technology is developed and introduced to the market.
Standard error	The standard deviation of the sampling distribution of a statistic. Standard error is a statistical term that measures the accuracy with which a sample represents a population. In statistics, a sample mean deviates from the actual mean of a population; this deviation is the standard error.

Concept/construct	Meaning
Strategic management	Encompasses key initiatives; both planned and unplanned which are actions by general managers on behalf of the owners, pertaining to the usage of an organisation's resources in order to improve its performance within the world in which it operates.
Strategising	The s-as-p field focuses on three building blocks that make up strategising. These are the practitioners, practices and praxis. Strategising from an s-as-p perspective encompasses the nexus between these three building blocks. The practitioners are the workers, the practices are the tools and the praxis is the work of strategy.
Strategy	Literature defines strategy as a plan for the future that organisations follow in order to achieve certain desired objectives, so that they can gain competitive advantage over their rivals.
Strategy-as-practice (s-as-p)	Strategy-as-practice focuses on the 'doing' of strategy and aims to better understand the activities those managers perform when strategising.
Technology adoption	Refers to the stage at which technology is selected for use by the individual or the organisation.
Technology adoption life cycle model	A model that describes the adoption or acceptance of a new product or innovation.
Technology diffusion	Refers to the stage in which technology spreads to general use and application.
Technology innovation	According to Gartner (2008), innovation refers to something new to a group or enterprise, something that is not currently done or produced, including new ways of working.
Technology s-curve	A model that is frequently used by organisations to track the technological progress of an innovation.
T-test	This test can be used to determine if two sets of data are significantly different from each other, and is most commonly applied when the test statistic would follow a normal distribution if the value of a scaling term in the test statistic were known.

Table 1-3: Abbreviations used in this document

Abbreviation	Meaning
ANOVA	Analysis of variance
DOI	Diffusion of innovation
EFA	Exploratory factor analysis
ICT	Information and communications technology
IT	Information technology
N	Number
P-value	Probability value
S-as-p	Strategy-as-practice

Abbreviation	Meaning
SE	Standard error
Std-Dev	Standard deviation
TAM	Technology adoption model
TAM2	Technology adoption model expanded

1.11 CHAPTER OUTLINE

Table 1-4 presents the outline of succeeding chapters in this study.

Table 1-4: Chapter outline of study

Chapter	Title	Description
CHAPTER 2	Strategy and management	This chapter outlines and explains the pertinent doctrines of strategy, strategic management and management in the contemporary environment. It centres mainly on the traditional versus the contemporary approach to strategising.
CHAPTER 3	Information and communications technology (ICT)	This chapter encapsulates the extant literature relevant to ICT strategy and ICT adoption factors. It presents an adoption framework for ICT drivers and inhibitors of technology adoption.
CHAPTER 4	Literature summary and conclusions	This chapter summarises relevant aspects discussed in chapters 2 and 3.
CHAPTER 5	Research design and methods	This chapter explains the research methodology and design used in the study. It explains the sampling, collection and analysis of the data technique used in the study.
CHAPTER 6	Paper 1: A critical analysis of ICT adoption: the strategy-as-practice perspective	This chapter is the first of 4 papers. It presents the findings of literature highlighting the modern <u>challenges of strategy formulation and details the critical aspects of ICT adoption</u>. It attempts to answer some of the research questions proposed in this study and based on these questions it presents the findings, limitations, managerial implications and opportunities for future research.
CHAPTER 7	Paper 2: ICT adoption drivers and inhibitors: the practice turn	This chapter is the second of 4 papers. It presents the empirical findings of the <u>drivers and inhibitors of ICT adoption</u>. It attempts to answer some of the research questions proposed in this study and based on these questions it presents the findings, limitations, managerial implications and opportunities for future research.

Chapter	Title	Description
CHAPTER 8	Paper 3: The relationship between decision-making and ICT adoption: the practice turn	This chapter is the third of 4 papers. It exposes the <u>critical aspects of decision-making for ICT adoption</u>. It attempts to answer some of the research questions proposed in this study and based on these questions it presents the findings, limitations, managerial implications and opportunities for future research.
CHAPTER 9	Paper 4: Prioritising ICT adoption and managerial views: the practice turn	This chapter is the last of 4 papers. It focuses on the <u>priorities of ICT adoption as viewed by the different levels of managers</u>. It attempts to answer some of the research questions proposed in this study and based on these questions it presents the findings, limitations, managerial implications and opportunities for future research.
CHAPTER 10	Conclusions	This chapter summarises and presents concluding remarks on the study.
CHAPTER 11	List of references	This chapter lists the references used in the literature research.
APPENDICES		This section contains the data-gathering instrument and a copy of the respondents' online consent.

1.12 REFERENCING TECHNIQUE

This study makes use of the Harvard referencing technique.

1.13 SUMMARY

This chapter provided a background, which set the scene for the study, highlighting the purpose of the study, the research problem and questions that the study aims to address and the value that this study intends delivering to the s-as-p community. Section 1.10 outlines the subsequent chapters of this study.

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2   STRATEGY AND MANAGEMENT

THE RELATIONSHIP BETWEEN STRATEGISING AND ICT ADOPTION

Chapter 1: Introduction

Chapter 2: Strategy and management

2.1 Introduction
2.2 Importance of strategy and strategic management

2.2.1 Deliberate and emergent strategies
2.2.2 Strategy-as-practice
2.3 Management in the contemporary environment

2.3.1 Management paradigm shift
2.3.2 ICT Management challenges
2.3.3 ICT Management opportunities
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Chapter 5: Paper 1

Chapter 6: Paper 2

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2.1 INTRODUCTION

Increased volatility and escalating levels of risk make it difficult for organisations to determine the future. Given this context, traditional methods of doing business are less effective in that they are restrictive in addressing environmental issues timeously. Thus, organisations need to re-evaluate their formulation of strategies to take advantage of environmental opportunities without attracting excessive risks. Contemporary strategies need to be aligned with the fluid nature of the organisation's external environment to better prepare them for long-term survival. In order to achieve this, organisations need to go back to basics and improve on their methods of strategising. In view of uncertainties experienced in the contemporary environment, this chapter scrutinises literature and seminal works pertaining to the importance of strategy. It also focuses on an alternative approach to strategising and highlights challenges that confront management. Critical information is synthesised and information pertinent to the study is deliberated.

2.2 IMPORTANCE OF STRATEGY AND STRATEGIC MANAGEMENT

Literature defines strategy as a *plan* for the future that organisations follow in order to achieve certain desired objectives so that they can gain pursued advantage over their rivals. More importantly, it refers to the organisation's intentions and activities it pursues to embrace its market environment for sustained existence. It is evident from research that in order for organisations to survive, they must have a well-defined strategy. Having a proper strategy is a matter of discipline and should organisations ignore the importance of having one, their success at survival will be weakened (Porter, 2001:11). Porter (1996:64) asserts that competitive strategy is about being unique; purposefully selecting a different set of activities to deliver a distinctive mix of value. Every aspect of the organisation must play a role in this strategy for it to survive. Strategic management deals with how organisations achieve competitive advantage through these strategies (Bitar & Hafsi, 2007:403).

Since the early eighties technology has been gaining momentum as a strategic variable and has since become a significant contributor towards the field of strategic management and provides a dominant role in the constructing of corporate strategies (Friar & Horwitch,

1985:147). Over the past two decades, scholars have undertaken extensive research in understanding the construct of strategic management and its importance to organisations (Furrer, Thomas & Goussevskaia, 2008:6). Research indicates that there are extensive articles written by seminal authors on this subject, which includes the likes of Hamel and Prahalad, Mintzberg and Waters, Porter, and Ansoff. According to Nag, Hambrick and Chen (2007:942), the field of strategic management encompasses key initiatives, both planned and unplanned, which are actioned by general managers on behalf of the owners, pertaining to the usage of an organisation's resources in order to improve its performance within the world in which it operates. Given the complex environment in which organisations operate, strategic management has become more imperative now than ever before.

The main purpose of competitive advantage is to achieve sustainable preferential demand for products so that an organisation's performance can be enhanced. *Sustainable* means that the organisation's skills and resources, which underlie competitive advantage, must resist duplication by other organisations. According to O'Shannassy (2008:172), for a resource or skill to create sustainable competitive advantage, four attributes must be satisfied. They must be *rare,* have *value*, be *imperfectly imitable* and not have any *equivalent substitutes.* Competitive advantage can be obtained from product, process and managerial innovations; brand equity; corporate culture; communication goods; organisational expertise and producer learning; and from information and communications technology (Bharadwaj, Varadarajan & Fahy, 1993:88).

Amid increased globalisation, technological innovation and changing social trends, the current environmental context within which organisations interact is experiencing increasing instability (Eisenhardt *et al.*, 2010:1263). Change or alter strategies? This is the question weighing heavily on executives' minds, given the levels of uncertainty prevalent in the current environment. In order to achieve competitive advantage and ultimately sustain their survival, organisations are under extreme pressure to change or adapt quickly to their environments (Ghobakhloo, Hong, Sabouri & Zulkifli, 2012:37). According to the Ansoff School of Strategic Management, the effective response for a long-term organisation's strategic success is achieved by monitoring the organisation's external environment (Ansoff & Sullivan, 1993:12).

Ansoff defines *environmental turbulence* in terms of the 'complexity of the environment, speed of change relative to possible speed of response, visibility of the future and predictability of the future'. Articles written by both Hussey (1999) and Sullivan (2002) commend Ansoff's significant contribution towards strategic management and bear mentioning that his contributions are still applicable to the contemporary environment. Ansoff's theory suggests that there are five degrees of environmental turbulence, namely:

- repetitive (stable and predictable);
- expanding (slowly and incrementally);
- changing (rapidly, although still incrementally);
- discontinuous (some aspects discontinuous, others predictable); and
- surpriseful (discontinuous and unpredictable).

It is evident from the performance of current market forces that organisations are experiencing mostly 'discontinuous' and 'surpriseful' influences from their environments. These influences may one way or the other be attributed to ICT innovations. Drejer (2004:511) indicates that organisations in the current context need to be strategically flexible and agile while being cost effective. In order for organisations to achieve this objective successfully, they must understand their environment better so that they can predict and react appropriately to environmental pressures in order to sustain their competiveness and ultimately maintain their continued existence. Thus, selecting the appropriate approach to strategy becomes imperative (Furrer *et al.*, 2008:11). Literature indicates that strategies may be crafted either through deliberate or emergent means.

2.2.1 <u>Deliberate versus emergent strategies</u>

Literature posits that much of the traditional thinking around strategy centred on the seminal works of Michael Porter and Henry Mintzberg. Porter's five-forces model makes use of an economic analysis to propose how organisations may seek competitive advantage within their environments, whereas Mintzberg's model for strategy considers strategy as an emergent occurrence (Levy, Alvesson & Willmott, 2003). Traditionally strategies were deliberate, which meant that the process of *implementation* followed the

formulation of strategy (Mintzberg & Waters, 1985:257). Deliberate strategies indicate that strategies are planned. According to Mintzberg (1987a:66), strategy may be perceived as something that managers *craft* rather than something that is planned.

Figure 2-1 identifies Mintzberg's five key aspects of strategy, namely *intended, deliberate, realised, unrealised and emergent*. *Deliberate* strategies are those strategies that are developed by top management and whose *objectives* are known upfront. These may be top-down plans, organisational statements and initiatives. *Emergent* strategies, on the other hand, are those strategies that emerge from the changing external environment. The objectives of these strategies are unknown upfront. These are likely to be strategies that arise because of competitive environmental responses. *Unrealised* strategies are those strategies that are *intended* but never get to be successfully implemented. These strategies are abandoned or left behind because they may be poorly constructed, poorly executed or for other reasons. *Realised* strategies are *intended* strategies that successfully accomplish their planned objectives. These strategies achieve their envisioned objectives.

Figure 2-1: Deliberate versus emergent strategies
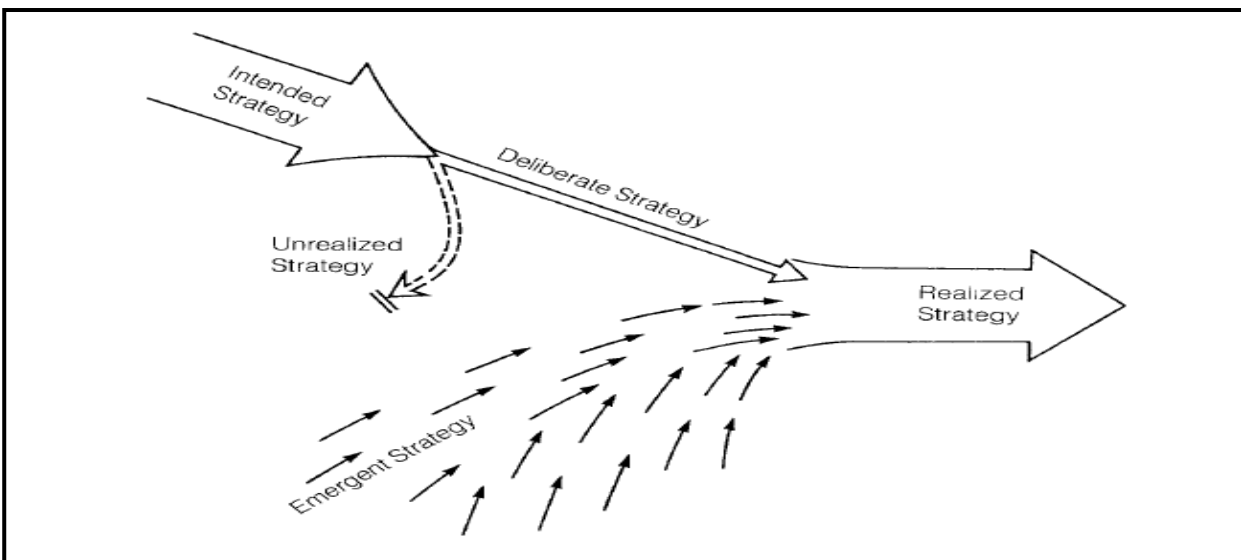
Source: Mintzberg, (1987b:14).

A common theme associated with deliberate strategies is a relatively stable environment. Emergent strategies, on the other hand, are associated with high environment volatility

and instability. Table 2-1 summarises the salient factors of the key differences between deliberate and emergent strategies as synthesised from various literature articles.

Table 2-1: Effects of deliberate and emergent strategies

Deliberate strategies	Emergent strategies
Strategy is viewed as a science and has a mechanistic approach	Strategy is viewed as an art and has an organic approach
Stable and predictable environments	Highly volatile and unstable environment
Hierarchical organisational structures	Organic organisational structures
Designed through a formal process	Designed by informal processes
Developed by top managers	Result of multiple decisions at various levels of management
Viewed as a top-down process	Viewed as bottom-up process
Objectives are known upfront	Objectives are developed as the strategy unfolds
Proactive strategy	Reactive strategy
Follows a linear approach	Follows an emergent or adaptive approach
Predictable and incremental innovations	Unpredictable and discontinuous innovations
Low levels of environmental dynamism and complexity	High levels of environmental dynamism and complexity

Source: Own compilation.

According to Mintzberg and Waters (1985:258), for strategies to be *perfectly deliberate,* they must meet the following conditions: their exact intention must be known in detail, eliminating all doubt; they must be common to all role players; and their intentions must be realised exactly. They go on to say that for strategies to be *perfectly emergent,* there must be 'order – consistency in action over time – in the absence of intention'. *Purely deliberate* or *purely emergent* strategies are rare.

Organisations may experience lengthy periods of stability in which there may be no need to deviate from their intended strategies. Then, unexpectedly their environment become so disrupted that their current techniques used to navigate them out of stormy waters may not be applicable and it becomes impossible to predict what kind of stability will emerge (Mintzberg, 1978:943; Welbourne, 2009:42). The recent global economic crisis is a good example of organisations being disrupted to such an extent that managers had to revisit their organisation's strategic objectives. According to Kaplan (2008:731), managers rely

heavily on their *cognitive frames for strategy-making* to make sense of their environment during periods of extreme instability. Managers do not always need to be specific down to the exact detail about their strategies or formalise everything about their strategies (Mintzberg, 1994:112). Sometimes they need to leave their strategies *flexible, as broad visions, to adapt to the changing environment*.

Literature review indicates that in the past strategists did not have to deal with turbulent environments nor did they have to develop agile strategies to contend with the unstable environments (Chakravarthy, 1997:69; Spanos, Prastacos & Poulymenakou, 2002:661). Given that contemporary organisations are in uncharted waters, a paradigm shift is required where strategy-making is concerned. This paradigm shift has given rise to a new school of thought that focuses on strategy as an *activity* rather than a *process (*Whittington *et al.*, 2006:618; Jarratt & Stiles, 2010:28). The critical thinking that this paradigm brings to strategy-making is that unlike the traditional approach which focuses on the macro-aspects of strategy, this approach deals with the social practices of strategy (Vaara & Whittington, 2012:2).

2.2.2   <u>Strategy-as-practice</u>

Modern thinking about developing strategic objectives has created a shift in the way strategy is viewed. This *new* view towards strategy has given rise to the 'practice' approach (Jarzabkowski, 2004:529). Strategy-as-practice (s-as-p) provides a unique perspective in understanding the human activities of strategic management, managerial activities and decision-making. It focuses on micro-level *social activities*, *processes* and *practices* that characterise organisational strategy and strategising (Golsorkhi, Rouleau, Seidl, & Vaara, 2010:1). S-as-p, according to Jarzabkowski *et al.* (2007:8), refers to strategising as the 'doing of strategy' and is explicitly focused on human activities. Traditionally, strategy was seen as something that organisations *had;* however, strategy viewed from a practice perspective is viewed as something that people *do* (Jarzabkowski, 2004:529; Chia & MacKay, 2007:223)*.* The s-as-p approach depicts the activities of strategy as something that is performed by individuals within the organisational context.

The s-as-p field focuses on three building blocks that make up strategising. These are the practitioners, practices and praxis. As indicated in Figure 2-2, strategising from an s-as-p perspective encompasses the nexus between these three building blocks. According to Whittington (2002:c1), practitioners are the *workers*, practices are the *tools* and praxis is the *work* of strategy. Practices are seen as the 'infrastructure through which micro-strategy and strategising occurs' (Jarzabkowski, 2003:24). Strategy practitioners are 'actors', those individuals who do the work of strategy; strategy practices are the 'material tools' through which the work gets done; and strategy praxis are the 'actions' that meet the objective of the strategy (Jarzabkowski & Spee, 2009:70).

Figure 2-2: A conceptual framework for analysing strategy-as-practice
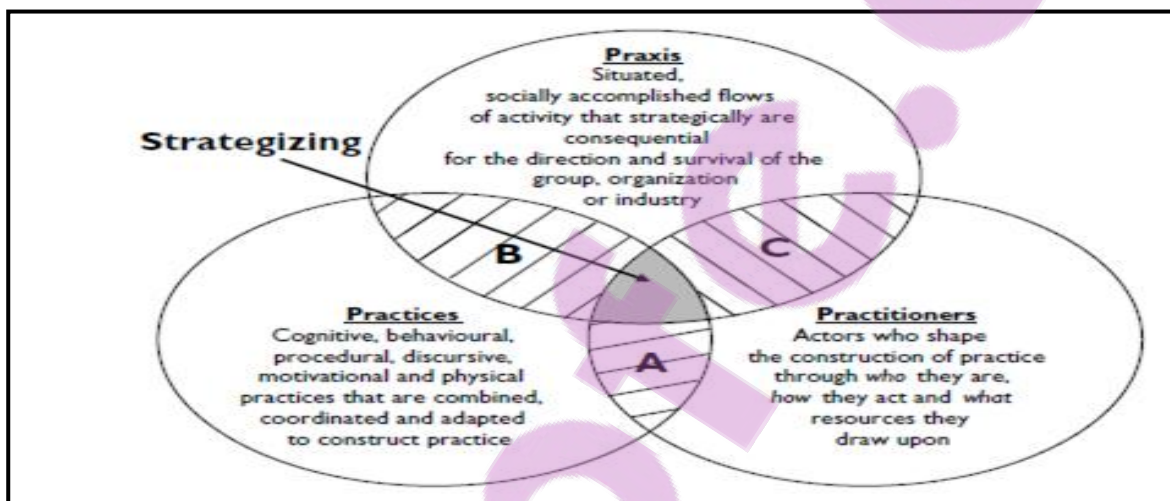
Source: Jarzabkowski, Balogun and Seidl (2007:11).

S-as-p is mostly concerned with the daily practices of individuals and how these actions influence strategy (Jarzabkowski & Wilson, 2002:358). Amongst others, managerial activities of strategising include the analysis of data, workshops, meetings, making presentations, strategy committees, and preparing formal documents – activities that must not be taken lightly (Whittington, 2003:117; Hodgkinson *et al.*, 2006:479). From an s-as-p perspective, strategy embraces all conversations, routines and interactions that contribute to galvanizing and transforming the organisation's direction on a daily basis (Denis *et al.*, 2007:197). There are also inspirational aspects to strategising, for example, creative processes, identifying new opportunities and understanding the circumstances of activities (Whittington, 1996:732). According to Jarzabkowski *et al.* (2007:12), traditionally

strategising was seen as something that only top management performed within organisations. However, s-as-p studies indicate that in the contemporary environment, both middle and lower level employees also contribute towards strategising. Strategising indicates their capacity to influence organisational actions by influencing strategic decisions.

Strategic management has gained prominence in organisations and with environmental pressures influencing strategy-making, it becomes more prevalent than ever that sound practices are adopted. In view of the environmental challenges confronting organisations in the contemporary business context, it becomes imperative to find new ways of addressing these challenges timeously, to ensure that the relevant strategic competitive objectives of the organisation are pursued. S-as-p provides a means of doing this by focusing on the day-to day activities of the organisation in order to gain a better understanding of strategising activities that form the hallmark of organisation's practices. Uncovering the detailed processes, practices and thinking about ICT adoption by decision-makers can contribute valuably towards strategic outcomes. Thus, in focusing on the strategising practices of the case organisation the study aims to provide empirical findings on *how strategising for ICT adoption happens in practice.* In doing so, the study aims at identifying how these social practices can possibly contribute and shape activities of strategy-making.

2.3   MANAGEMENT IN THE CONTEMPORARY ENVIRONMENT

Drucker (quoted by Zahra, 2003:16) defines management as 'the dynamic, life giving element in every business. In a competitive economy, above all, the quality and performance of the managers determine the success of a business; indeed they determine its survival'. The importance of managers' roles within organisations cannot be down played; clearly, they have a pivotal role to play in the survival of their organisation. Managers are those individuals who undertake to do the work of strategy and are seen as 'craftspeople' in the process of strategy (Whittington *et al.*, 2006:616). Managers' decisions and activities contribute greatly towards achieving an alignment between strategies and the environment within which they operate (Goll, Johnson & Rasheed, 2007:162).

In most organisations there are generally three distinct levels of management; top, senior and operational. Top managers are often referred to as executive managers, senior managers are alternatively known as middle managers and operational managers are referred to as lower level managers. Traditionally, these roles were clearly defined. A role is a set of behaviours expected of an individual in a certain context. This may either be formally written or be in the form of a prescriptive norm. Traditionally organisations had clear boundaries, formal procedures and well-defined authority structures.

Top managers were the architects of the vision and mission of the organisation, viewed as industry experts, who chose where the organisation might utilise its efforts and were responsible for the organisation legally and socially. In essence, top managers were responsible for developing strategies, while senior and operational managers were responsible for implementing these strategies. Thus, it was a commonly supported view that structure always followed strategy and that systems supported these structures. However, according to Bartlett and Ghoshal (1994:79), managers of modern organisations are shifting their focus towards that of 'purpose, process and people' in order to cater for the dynamic nature of the current environment.

2.3.1 Management paradigm shift

The traditional model of strategy formulation is entrenched by a hierarchical structure that is supported by predictable and stable environments, whereas contemporary environments are dynamic with organisational structures that are supportive of middle and lower level involvement (Mantere & Vaara, 2008:342). When compared to the traditional model, distinct management roles are becoming obsolete because of the impact of ICT on management's decision-making abilities (Drucker, 1988:3; Spanos *et al.*, 2002:662; Kearns & Sabherwal, 2006:136). Understanding how organisations react to change requires insight at an individual level (Christensen & Overdorf, 2000:1; Stensaker & Falkenberg, 2007:143). Senior and operational managers need to be empowered to make critical decisions so that they can cater for their customer's changing requirements. Decentralised strategy-making allows critical strategic influences to originate from managers at lower levels (Anderson, 2004:1274). These decisions may have a significant

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impact on strategising within the organisation. Table 2-2 indicates the different management paradigms between the contemporary and the modern business context.

Table 2-2: Management paradigm

Traditional	Modern
Organisational discipline	Organisational learning
Rigid organisation	Flexible organisation
Low trust	High trust
Command and control	Empowerment
Hierarchies	Markets and networks
Strategy as prescriptive plans	Strategy as process, building consensus and unity
Not-invented-here syndrome	Receptivity to external inputs
Technology driven by strategic business units	Technology driven by core competencies
Functional structures	Business process structures
Knowledge is periodically useful and resides in few staff	Knowledge is a key source of competencies and its creation and diffusion is encouraged throughout the organisation

<u>Source</u>: Dodgson, Gann and Salter, 2008.

S-as-p suggests that middle and lower level managers also influence strategy, albeit on an operational level (Jarzabkowski *et al.*, 2007:12). These actions, although unintended, have significant influence on strategy and thus on the survival of the organisation. According to Jarzabkowski *et al.* (2007:12), traditionally strategising was viewed as something that only top management performed within organisations. However, s-as-p studies propose that middle and lower level employees also contribute towards strategising. The role of middle managers has changed from that of implementing top manager's intentions towards that of participants in crafting the strategy on a daily basis (Drummond & Brandao-Bernardes, 2008:4). Middle managers are seen as people who are influential in the strategic processes throughout the organisation. Operating-level managers' roles are also undergoing fundamental change from that of implementers to that of entrepreneurs (Chapman, 2001:57).

Managers are involved in a wide range of decision-making activities that are of strategic importance to the organisation (Hendry, 2000:958; Chapman, 2001:63). Strategic issues

become evident from the business context within which managers engage daily and can contribute towards the strategic objectives of the organisation (Elter, 2004:6). Technological advancement plays a pivotal role in determining organisational success and, as such, organisations have increased their adoption of sophisticated technologies (Zahra & Covin, 1993:451). Technology adoption serves as a vehicle that allows management to participate in a world of constant innovation with strategic benefits. The right technology adoption can contribute significantly towards the day-to-day activities of managers. It is of crucial importance that management has a clear understanding of factors that can influence the adoption of new technologies (Sultan & Chan, 2000:106). Not every technology innovation will be of strategic importance. Knowledge of the environment, the need that the technology will address and the skills required for using the technology can form the basis for management to make their decisions. More importantly, for managers to select a particular technology that addresses a particular strategic need, they will need to understand the day-to-day activities of the organisation that relate to strategic outcomes. Thus, through empirical evidence the study aims to determine if the different levels of management influence ICT adoption factors and if so what are the driving forces behind this diverse view, which shape these practices.

In the contemporary context of strategising, top managers rely greatly on both middle and operational managers' advice for the future strategic direction of the organisation. Of course, this advice will depend on how middle and operational managers understand and interpret the situation, and the need for suggested change. From research, it is evident that with increased uncertainty and environmental challenges experienced through technological innovations and technology adoption, the approach to strategising is changing (Hart & Banbury, 1994:266; Barkema, Baum & Mannix, 2002:916). This occurs predominantly as a result of management's response to innovations in technology. In the new economy, strategists will not always develop strategies behind closed doors or in secret meetings. In a study undertaken by Dameron and Torset (2009) on the strategists discourse on their practices, it was found that strategists rely on 'social interactions, complementary collaborations, intuition and action' to develop their strategies.

Given the dynamic forces at play in the market environment, managers cannot afford to delay decision-making by having complicated decision structures. Customers and clients

alike expect fast turnaround times for service delivery. Hierarchical structures by their very nature imply longer turnaround times for decision-making. Market environments are overwhelmed by disruptions caused by ICT innovations and, as such, organisations need to evolve to adapt to these changes by creating organic structures that align to their environment (Damanpour & Gopalakrishnan, 1998; Andersen, 2001:105). This implies that the traditional model of hierarchal structures, which thrived on stable market forces, is becoming obsolete in the contemporary environment. Thus, organisations need to flatten their decision-making structures to cater for agility, flexibility and speedy service delivery to their clients (Ferioli & Migliarese, 1996:199). In the contemporary context, for organisations to successfully address quicker turnaround times for decision-making, traditional management structures have become redundant. These forces mostly affect middle management's roles, as they are less directly involved in daily operational problems (Ferioli & Migliarese, 1996:199; Landry, Mahesh & Hartman, 2006:137).

Figure 2-3 indicates a shift in management roles from the traditional model due to environmental pressures and influences. It is evident from the contemporary environment that environmental pressures will only serve to increase in momentum, thus one can infer that organisational structures may undergo further evolution.

Figure 2-3: The evolution of management structures
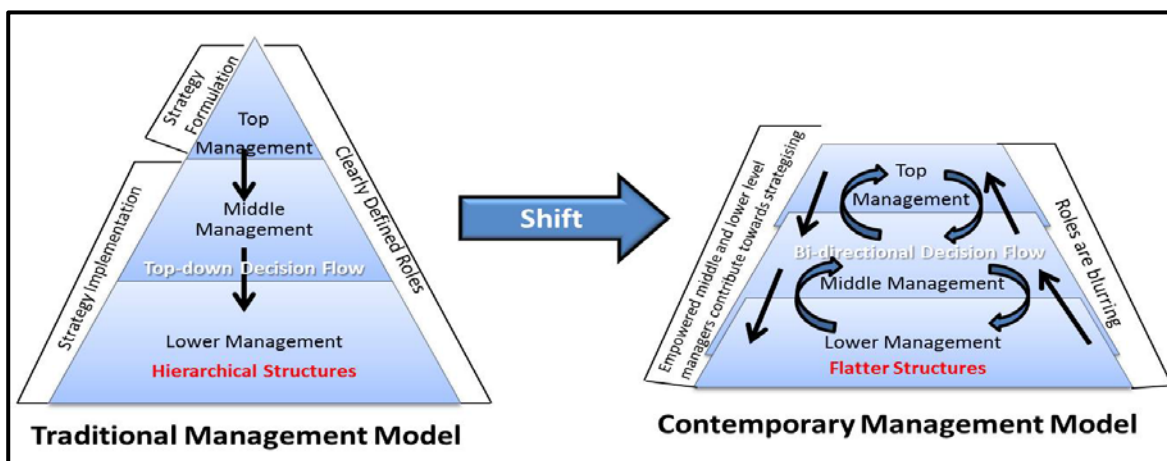
Source: Own compilation.

2.3.2   <u>ICT management challenges</u>

Amid increased globalisation, technological innovation and changing social trends, managerial work become more complex and is no longer as simple as it was before. It is evident that the nature of management has to change because demands on management are changing. Managers' roles are shifting from the traditional way of doing things towards a more flexible and adaptable role in order to meet clients' changing needs. The realm of managers is expanding through new work practices caused by ICT adoption as a result of technological innovations (Hollenstein, 2002:5). Although the challenges associated with technological innovation can be minimised through effective strategies, these strategies themselves exerts challenges on managers when strategising. The reason for this is that new options and unexpected constraints present themselves and render parts of the intended strategy undesirable, insufficient or unfeasible (Pukszta, 2011).

Other ICT challenges experienced by managers in the current context are increasing competition for skills and resources, greater personalisation and customisation of products and services, increasing concern for the environment and the pressures of social networking.

Since the advent of technology, there have been many latest and greatest gadgets. All users want the next new thing and they want it now. This is the same for customers and their requirements that managers have to cater for. With the arrival of Internet, customers are much more knowledgeable, informed and empowered with information. They no longer want cookie-cut products. Customers are demanding a greater involvement and say in the products and services they receive. Managers are faced with the challenge of delivering more personalisation, better adaption, greater customisation and increased value on their products and services in much shorter time frames. This creates a vicious cycle because in catering for these requirements managers have to look to technology adoption as a possible solution.

Technological advances in social networking, such as Twitter, Facebook, YouTube, Blogs, Flickr, Instant Messaging and the like, have also exerted pressure on management. In their global information technology report of 2012, Dutta and Bilbao-Osorio (2012) indicate

that the social media movement was not a trend that started within the enterprise, yet it continues to drive the knowledge economy. Customers know the value of these social networking options, especially as a means for sharing ideas, finding alternatives and discovering new ways in which to increase efficiencies. Managers are now required to provide better services much faster, which may not always be part of a planned strategic initiative. Managers' decisions around these activities become critical and can contribute towards the strategic value or liability of an organisation. In order to gain a better understanding of the impact of technological adoption by management from an s-as-p perspective, it becomes necessary to understand the cognitive rationalisation that takes place amongst individuals (Hodgkinson & Clarke, 2007:244). As organisations and technology undergo radical transformations, management continue to interact with technology on a daily basis. These interactions may become embedded in managers' social practices and can influence how managers perform their daily activities at the workplace. Technology influence on manager's job context may create thinking patterns that can influence technology adoption decisions. Drawing on empirical evidence from the case organisation the study aims to determine whether the activities of job function can contribute towards ICT adoption decisions.

2.3.3   ICT management opportunities

There is no doubt that the pace of ICT innovation and the adoption thereof has a profound effect on the manner in which managers operate, which ultimately impacts the approach in which organisations conduct business. Although the rapid advancement of technological innovations inherently presents challenges to organisations, there is no doubt that it also provides strategic alternatives. In recent decades, the use of ICT has advanced from basic systems to mechanisms that have radically introduced strategic changes to fundamental business processes (Gurbaxani & Whang, 1991:59; Renken, 2004:53).

ICT advancements have followed the projection made by Gordon Moore in 1965 and are evolving more swiftly than ever before. The general trend of ICT is towards being smaller, cheaper, more powerful and more integrated into daily operations of both individuals and organisations. Technology continues to overwhelmingly influence the manner in which

organisations work, collaborate, communicate, interact, learn, socialise and eventually operate in almost every aspect of their dealings.

Technology adoption serves as a vehicle that allows management to participate in a world of constant innovation. At the same time, it serves as a catalyst for fundamental changes within the organisation. However, the right technology needs to be adopted in order for organisations to reap the benefits of technological innovations. The opportunity that technology adoption presents to managers is to understand the interdependences that exist between business strategies, business rules, processes and procedures and determine how business can benefit from technology adoption. Strategies that are central to technology adoption can be viewed as strategic especially for those technologies that have the potential to provide competitive value. Thus, by leveraging from the s-as-p perspective with the focus on ICT adoption activities, -context and –prioritisation in the case organisation, it is possible to determine if the pace of innovation influences management to adopt innovative technology sooner.

2.4 SUMMARY

Formulating appropriate strategies is more important now than ever before. However, given the uncertainty that exists in current environments, market opportunities and risks have transformed the manner in which strategies are formulated (Courtney, 2001:38). It is necessary for strategies to be more flexible and adaptable to cater for the changing nature and uncertainties experienced in the external environment. This helps ensure long-term organisation sustainability. It is clear from research that a more agile approach to strategy formulation is required. However, the changes that are necessary for strategy-making to respond sooner to the unpredictable external environment are unclear.

Literature review indicates that in the past strategists did not have to deal with turbulent environments nor did they have to develop agile strategies to contend with the unstable environments (Chakravarthy, 1997:69). Given that modern organisations are in uncharted waters, a paradigm shift is required where strategy-making is concerned. This paradigm shift has given rise to a new school of thought that focuses on strategy as an *activity* rather

than a *process (*Jarratt & Stiles, 2010:28)*.* The critical thinking that this paradigm brings to strategy-making is that unlike the traditional approach, which focused on the macro-aspects of strategy, this approach deals with the social practices of strategy (Vaara & Whittington, 2012:2). In unveiling the micro-activities involved in strategising, a better understanding can be achieved on how organisations deal with day-to-day uncertainties of the contemporary environment. Seeing that s-as-p is a relatively new field of strategy, literature is weak in shedding light on how strategising for ICT adoption happens in practice. Through empirical evidence, it is possible to provide insight into how strategising practices and praxis associated with ICT adoption happen. Therefore, by drawing on the s-as-p perspective, the case organisation focuses on adoption activities, -processes and -prioritisation practices to reveal insights into strategising for ICT adoption.

Managers are those individuals who undertake to do the work of strategy and are seen as 'craftspeople' in the process of strategy (Whittington *et al.*, 2006:616). However, amid environmental uncertainties and increasing challenges, the nature of management is changing because the demands on management are changing. Managers' roles are shifting from the traditional way of doing things towards a more flexible and adaptable role in order to meet clients' changing needs. Although technology adoption serves as a vehicle that allows management to participate in a world of constant innovation, it also serves as a significant contributor towards challenges that plague managers. To what extent management's role is impacted by ICT adoption and exactly how this influences managers' day-to-day activities is still unclear and needs to be explored further. Against the backdrop of the case organisation, this issue is be explored further.

3   INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)

THE RELATIONSHIP BETWEEN STRATEGISING AND ICT ADOPTION

- Chapter 1: Introduction
- Chapter 2: Strategy and management
- Chapter 3: Information and communications technology adoption
  - 3.1 Introduction
  - 3.2 Information technology (IT) and Information and communication (ICT) technology
  - 3.3 ICT strategy and its importance
    - 3.31 Alignment between business and ICT strategies
  - 3.4 Technology adoption
    - 3.4.1 Influence of education and job context on ICT adoption
    - 3.4.2 Organizations' response to ICT adoption
  - 3.5 Framework for technology adoption drivers and barriers
  - 3.6 Drivers for technology adoption
    - 3.6.1 Innovation factors
    - 3.6.2 External factors
    - 3.6.3 Organizational factors
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    - 3.7.1 Innovation factors
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3.1 INTRODUCTION

The evolution of information and communications technology (ICT) has permeated daily operations of organisations and continues to influence the way business is done globally. If technology innovations are seen as the fuel for change, then the adoption thereof may be viewed as the vehicle used by management to participate in this world of constant change, and the diffusion thereof can be acknowledged as the drivers for progress within organisations. With this progress comes strategic importance and strategic challenges. The speed of advancement and innovations in technology are the main contributors of environmental instability. Much of the literature focuses on the strategic importance of ICT and the need to align both business and ICT strategies for optimal benefit realisation. Although ICT and business strategy alignment is strategically important, of equal importance are the strategic decisions pertaining to the adoption of ICT. The rapid rate of technological advancement enables managers to make use of ICT adoption as a means to keep abreast of technology developments in their external environment. In order to understand the actions and interactions of the strategy practitioner, it becomes necessary to focus research on ICT strategy and its possible contribution towards achieving competitive advantage. This chapter analyses extant literature on ICT and focuses on the strategic importance of technology, the adoption thereof, and critically examines its barriers and drivers. It also scrutinises the current challenges that ICT adoption presents to management. The purpose of examining the technology aspects identified in this chapter is to understand the role that ICT strategy and ICT adoption plays in strategising and in the development of strategic objectives.

3.2 INFORMATION TECHNOLOGY (IT) AND INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)

Information technology is defined as a 'set of tools, processes and methodologies (such as coding/programming, data communications, data conversion, storage and retrieval, systems analysis, design and systems control) and associated equipment employed to collect, process and present information. In broad terms, IT also includes 'office automation, multimedia and telecommunications' (BusinessDictionary.com, 2013).

Improving the 'efficiency and effectiveness' of organisations is the traditional domain of IT (Bakos & Treacy, 1986:109). IT is an umbrella term, which encompasses ICT that focuses primarily on communications technologies (Tech.Terms.com, 2011). ICT includes technologies such as desktop and laptop computers, software, peripherals and connections to the Internet that are intended to fulfil information processing and communications functions (Statistics Canada, 2008). IT and ICT are used interchangeably in this study.

ICT is an important strategic resource. Effectively managed, they increase the organisation's ability to provide increased productivity, improved efficiency of services and strategic advantages for the organisation in its competitive market (Bakos & Treacy, 1986:107). ICT forms an integral part of the organisation and is among the most important drivers for change (Little, 2011:1).

3.3 ICT STRATEGY AND ITS IMPORTANCE

Ward and Peppard (in Silvius, 2009:3) define ICT strategy as the 'prioritising and selection of IT projects, based on their benefits and added value for the organisation'. Strategic planning for ICT requirements have become a necessity to support the organisation's objectives as it responds to global competition. Due to increased technology adoption, the need for the development of an organisation's technological policies, which are consistent with business strategies, becomes critical. The traditional view held by most managers is that although ICT is a dominant and important source of strategic advantage, they also agree that ICT strategy is a functional strategy and should respond to the chosen business strategy (Venkatraman, Henderson & Oldach, 1993:140).

3.3.1 Alignment between business and ICT strategies

Strategic alignment centres on the 'fit' between the priorities and activities of the IT function and that of the business (Chan, 2002:98). Henderson and Venkatraman (1993:8) propose a strategic alignment model as depicted in Figure 3-1. This model identifies the integration between business and ICT domains. The *strategic integration* is the link

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between business strategy and ICT strategy that reflects external components, and deals with the capability of ICT functionality to influence and support business strategy. *Operational integration* deals with the corresponding internal domains. The effective management of ICT requires a balance among the choices made across all four domains. Management needs to focus on the key components of ICT strategy in order to achieve the business strategic objectives.

Figure 3-1: Strategic alignment model
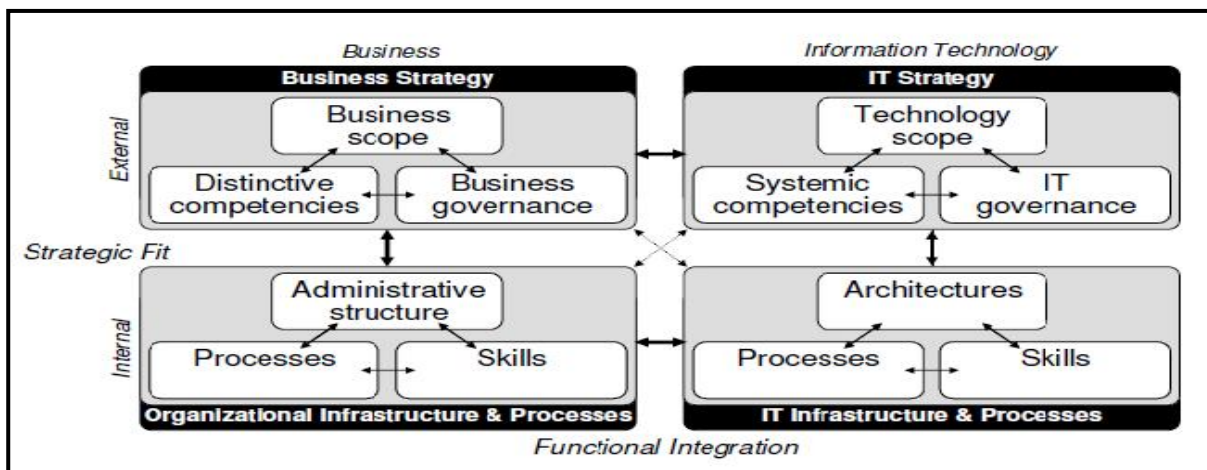
Source: Henderson & Venkatraman (1993:8).

There is no doubt that organisations should ideally align their information technology strategy and their business strategies for optimal performance. However, with the rapid pace of technology advancement it is becoming difficult to keep abreast of the latest trends to sufficiently align their business and ICT strategies. ICT strategies serve as an enabler of business processes that mainly have an internal impact or as a driver for business innovations that can create competitive advantage within the industry in which an organisation operates. According to Luftman, Lewis and Oldach (1993:199), given the current environment within which organisations interact, their success is critically dependent on more agile and flexible responses to their environments.

The traditional approach to aligning business and technology strategies is largely based on stable environments with organisations built on a mechanistic foundation and managers adopting a very structured style of strategy formulation. However, over the past decade technology has changed the manner in which organisations operate. According to Dutta

and Bilbao-Osorio (2012), the global economy is not only experiencing turbulence but has also become increasingly hyperconnected. Thus, the traditional models used by organisations to develop strategies and conduct business operations have become obsolete in responding timeously to environmental challenges. The strategy approach required is one that can deal with instability experienced in the current environment, while being agile and flexible to respond to business needs. Given this context, Smaczny (2001:800) presents an alternative paradigm for organisations to develop effective business and ICT strategies. He suggests that organisations should consider a 'fusion' between ICT and business functions resulting in organisations developing a single integrated strategy.

ICT has become an integral part of the fabric of everyday life in organisations. The impact of ICT on productivity and growth is complex and continues to be so with the rapid pace of ICT innovations. These innovations contribute towards strategic challenges that managers have to endure on a daily basis. In view of this, it is important that managers be kept abreast of the emerging technologies and developments in ICT. This knowledge will serve as important drivers in the industry and will aid in strategic decisions (Ballarat ICT 2030, 2011). Technology adoption is seen as a genuine source and driver in developing business strategies and can no longer be seen as an afterthought (Spanos *et al.*, 2002:661; Ogalo, Asaka & Aila, 2011:312).

3.4   TECHNOLOGY ADOPTION

Technology *adoption* refers to the stage at which an individual or an organisation selects technology for use, whereas *diffusion* refers to the stage in which technology spreads to general use and application (Carr, 2012). Gartner (2008) defines *innovation* as something *new* to a group or enterprise; something that is not currently done or produced, including new ways of working.

Literature indicates that technological innovation and the adoption thereof contributes significantly towards the efficiencies and challenges that organisations experience. These innovations have altered the way in which traditional organisations operate. Technological

innovation has reach exponential proportions leaving organisation struggling to catch up with new foundational technologies (Hangel, Brown & Davison, 2008:82). Technological advancement plays a pivotal role in determining market success and, as such, organisations have increased their adoption of sophisticated technologies (Zahra & Covin, 1993:451). Managers are involved in a wide range of decision-making activities that are of strategic importance to the organisation (Chapman, 2001:63). Used appropriately, technology adoption can enable management to close strategic gaps that may exist between the organisation and its environment. Silvius (2009) indicates that the influences of technology on different business areas in an organisation are shifting towards that of efficiency in productivity. In adopting new technologies, decision-makers can be empowered to be proficient through the speed and accuracy at which decisions are taken. User interactions with technology have a tendency to be recurrent. This implies that user's preference for a selected technology is largely dictated by their experience with the technology in practice, which becomes a habitual behaviour (Orlikowski, 2000:410). Although repeated user practices can become the norm, it is possible for other environmental factors to influence this pattern. In order to gain a better understanding of the potential ICT adoption factors that influence user practices, it is necessary to investigate adoption factors in more detail. The relevance of the identified adoption factors will be measured against the case organisation to determine if empirical support exists for their relevance in practice.

3.4.1 <u>Influence of education and job context on ICT adoption</u>

ICT is often regarded as skills-based and many empirical studies have been conducted on the complementary relationship between the use of ICT and the demand for skilled workers. Literature posits that qualified workers increase organisational readiness because educated adopters of ICT are inclined to be more innovative (Bayo-Moriones & Lera-Lopez, 2007:352). According to Chun (2003:1), a highly educated workforce may lead to the earlier adoption of new technology. The relationship between skilled workers and early adoption of ICT may be directly linked to job context because technology-centric organisations demand greater adoption of technology that in turn, requires highly skilled workers. Information-intensive organisations tend to increase their use and adoption of ICT

(Weber & Kauffman, 2011:683) which may be a direct influence of job context. If patterns stem from the use of technology as a result of past experience and practices, is it possible for factors such as level of education, exposure to technology and job context to shape ICT adoption decisions and eventually become organisational practices? Against the backdrop of the case organisation, these aspects will be measured to determine whether empirical findings indicate that these factors shape ICT adoption practices.

3.4.2 <u>Organisations' response to ICT adoption</u>

The adoption of new technology can radically affect organisations especially if the adopted technology is different from internally established core technologies (Khanagha, Volberda, Sidhu & Oshri, 2013:52). Preference is given to internally established technologies to leverage off existing investments unless the organisation intends to capitalise on emerging technologies by pursuing competitive advantage (Khanagha *et al.*, 2013:53). Organisational culture influences organisational readiness and can contribute either positively or negatively towards the adoption of technology (Johnson, 2010:161). Organisational readiness is influenced by factors such as organisational policies, capital investments available for adoptive technologies, and internal practices and procedures.

Management decisions are impacted by both the rate and speed of adoption. The rate of adoption relates to their need to introduce innovativeness into the organisation. Organisations with a high adoption rate indicate a higher drive for innovation towards efficiency or competitive advantage. The speed of adoption relates to the timing of when the innovation was introduced into the market. Organisations may adopt a wait-and-see approach to determine the success of the innovation. Management's approach towards the speed of adoption is either early or delayed depending on organisational readiness and need.

It is crucial that management has an understanding of the factors that can influence the adoption of new technologies (Sultan & Chan, 2000:106). Not every technology innovation will be of strategic importance. For managers to select a particular technology that addresses a particular strategic need, they will need to understand the day-to-day

activities of the organisation that relate to strategic outcomes. The field of s-as-p can contribute towards this understanding as its key focus is on the micro-activities of strategising undertaken by management. Managers also need to understand where in the technology life cycle a particular product is and what the potential strategic benefits will be before they decide to adopt the technology (Meade & Rabelo, 2004:669). As part of the strategising process, tools can assist managers in resolving uncertainties, determining the progress of technology and understanding the market better, for the purposes of informing better adoption decisions. ICT Adoption tools are often used by managers to assist in providing sound and logical solutions on what strategic choices to make and to assist in sense-making. Although technology adoption tools can assist management in determining where in the life cycle a particular technology feature, there are not many tools available for strategy practitioners to determine this successfully. Tools that are available in the market to determine the progress of an innovation are based on assumptions and increase the challenge for strategy practitioners to contribute reliably to decision-making for ICT adoption. In addition to the diffusion of innovation model and technology acceptance model (discussed in section 3.5), other models used to determine the technology progress with relative success are the technology s-curve and the adoption life cycle model.

3.4.2.1   *Technology s-curve*

The technology s-curve is a model that is frequently used by organisations to track the technological progress of an innovation. The model was named as such because the plot of technological progress often takes an 's' shape. At the start progress for any new technology is slow, then critical mass for the technology builds as expertise in the product increases and eventually the technology matures where progress is slow. This is followed by an ensuing decline of the product or the start of a new innovation (Asthana1995:49). This life cycle is depicted in Figure 3-2.

Figure 3-2: Technological s-curve
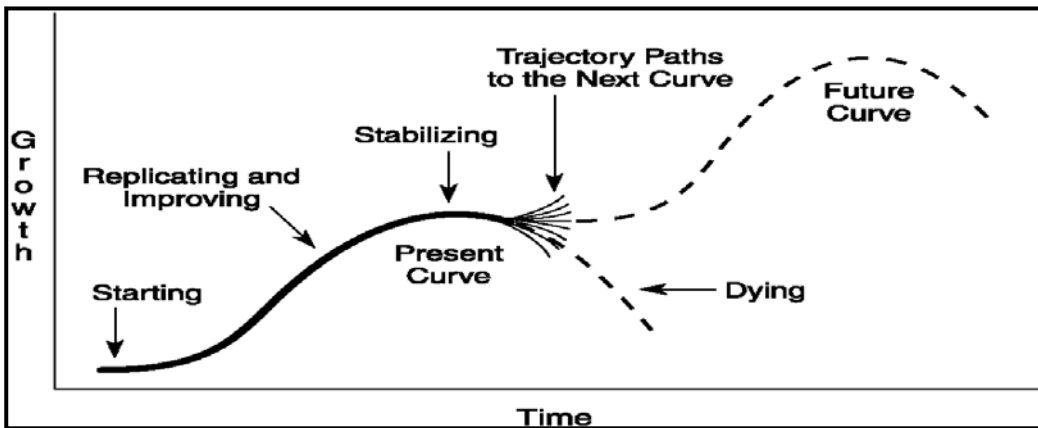
Source: Motorway (2011).

3.4.2.2   *Adoption life cycle*

This model describes the adoption or acceptance of a new product or innovation. Originally developed by Everett Rogers, this model classifies adopters of innovations into various categories, namely *innovators*, *early adopters*, *early majority*, *late majority* or *laggards*. Meade and Rabelo (2004:668) later modified this model to indicate the chasm that exists between the *early adopters* and the *early majority.* This model is depicted in Figure 3-3. The technology adoption life cycle is an essential tool that management can use during strategising to ensure that the appropriate ICT strategy is adopted.

Figure 3-3: Technology adoption life cycle
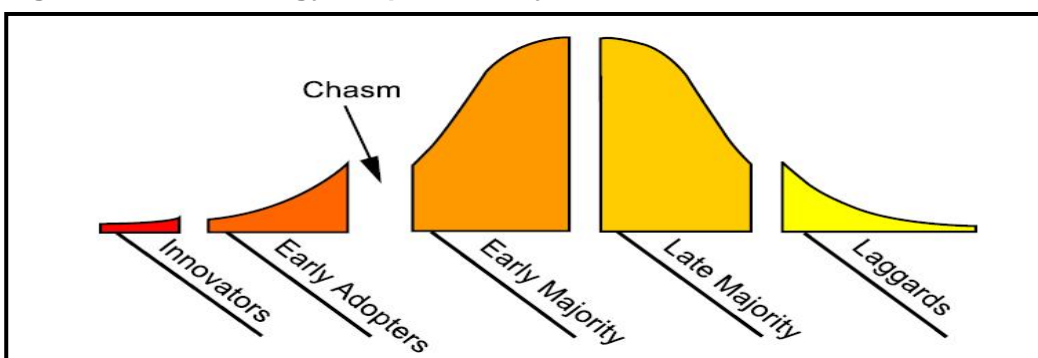
Source: Meade and Rabelo (2004:668).

It is important for managers to know that different stages in the technology life cycle will require different types of strategies. For example, the differences between consumers in the 'early adopters' and the 'early majority' are so great that innovation frequently falls into

a *chasm* noticeable by loss in revenue or declining market share. The challenge facing management is there are no scientific means of determining what stage of the life cycle an innovation is. Erroneously evaluating a product's position within the technology adoption life cycle can have a devastating strategic impact on an organisation.

3.5   FRAMEWORK FOR TECHNOLOGY ADOPTION DRIVERS AND BARRIERS

As stated in section 3.4, to gain a better understanding of the practices of practitioners in strategy-making it is necessary to explore all possible factors that influences the praxis of practitioners. Even structural characteristic like organisational size has the potential to influence practitioner's decisions and activities relating to ICT adoption. Numerous authors have attempted to define the pertinent aspects of ICT adoption to recognise patterns in user behaviour when adopting technology. For example, according to Lee (2004:57), the variables that influence adoption behaviour include relative advantage, compatibility, ease of use, self-efficacy, financial slacks, innovativeness, image and competitiveness. In addition, a model developed by Russell (2004:105) indicates that technological adoption is determined by characteristics that include perceived attributes of the innovation, organisational factors, communication channels and leadership. It is important to note that these authors, like many others, have expanded their technology innovation and adoption models on the seminal works of Rogers' (1995) *Diffusion of Innovation* (DoI) and Davis's (1989) *Technology Acceptance Model* (TAM), which were the early attempts undertaken to determine user practices when adopting technology. Venkatesh and Davis (2000) later expanded the TAM model to include *subject norms* in order to determine the changes that they bring with increased user experience of the target system over time. This is referred to as the TAM2 model.

The DoI model posits that the adoption of innovation occurs in stages and adopters' decisions to adopt the technology are based on their perceptions of the technology. The TAM and TAM2 models focus on adaptors' behaviours and posit that their beliefs affect their attitude for the technology that, in turn, influences their intentions and usage of the technology. The seminal works of Rogers and Davis, synthesised with literature relating to technology adoption, form the basis of the conceptual framework discussed in this study.

Table 5-2 contains an inventory of all literature articles examined for ICT adoption factors. These factors were classified into related categories for easy interpretation of attributes contained therein. The adoption factors and their attributes make-up the ICT adoption framework used in this study. The positive and negative aspects of ICT adoption namely drivers and barriers are expanded in detail in sections 3.6 and 3.7.

3.6 DRIVERS FOR TECHNOLOGY ADOPTION

Technology has come a long way since its inception and performs a pivotal role in organisations. It has become the cornerstone of many companies' competitive advantage strategies. Decision-makers in key leadership positions are well aware that in today's contemporary environment it is technology that is driving change and that change demands technology (Barba-Sanchez *et al.*, 2007). Frambach and Schillewaert (2002:165), and Tarafdar and Vaidya (2006:428) assert that the degree to which an organisation is responsive to new technology will influence its tendency to adopt new technology. According to Sieber and Valor (2008:3), the main driving force behind technology adoption is no longer dependent on just the *cost-saving* criteria or the *automation* of tedious tasks, but rather the strategic implication it offers. In an ICT adoption study performed by Harindranath, Dyerson and Barnes (2008:92), the leading strategic advantage of ICT adoption was *keeping abreast of competitors*, including benefits in operational efficiencies. Drivers may comprise of innovation, and external and organisational factors.

Technology adoptions are a combination of push and pull influences. Thong (1999:190) suggests that technology innovations can occur as a result of *technology-push* or *market-pull.* In *market-pull* he postulates that a social need is felt which gives rise to a technical demand. In *technology-push* he asserts that a new technology is produced from an opportunity in the market that compels the market to absorb the innovation. Both *technology-push* and *market-pull* influence technology adoption. According to Gartner (2008:14), the *push* approach to innovation is expedient when an organisation wants to 'lead with technology' as opposed to the *pull* approach which is business-led. Figure 3-4 graphically depicts these forces.

Figure 3-4: Technology push and market pull forces
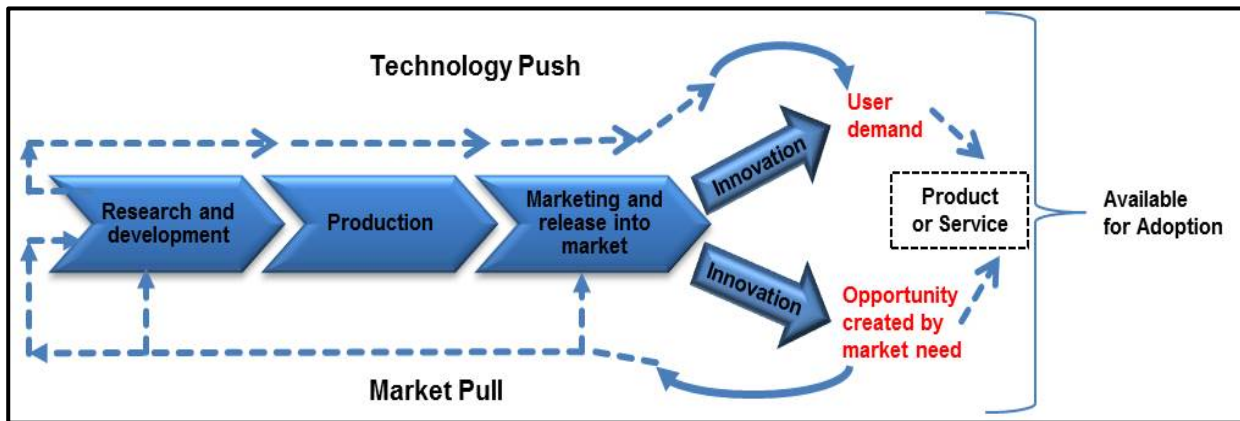
Source: Own compilation

Drivers are viewed as a *resource*, *process* or *condition* that is essential for the sustained success and development of the organisation. Critical drivers are key motives or main forces behind the need for decision-makers to adopt technology. These positive factors provide decision-makers with the impetus to adopt technology. Upon reviewing various literature articles on ICT adoption, a conceptual framework was developed which highlights the critical drivers of ICT adoption. This is presented in Figure 3-5 below.

Figure 3-5: Critical drivers for ICT adoption
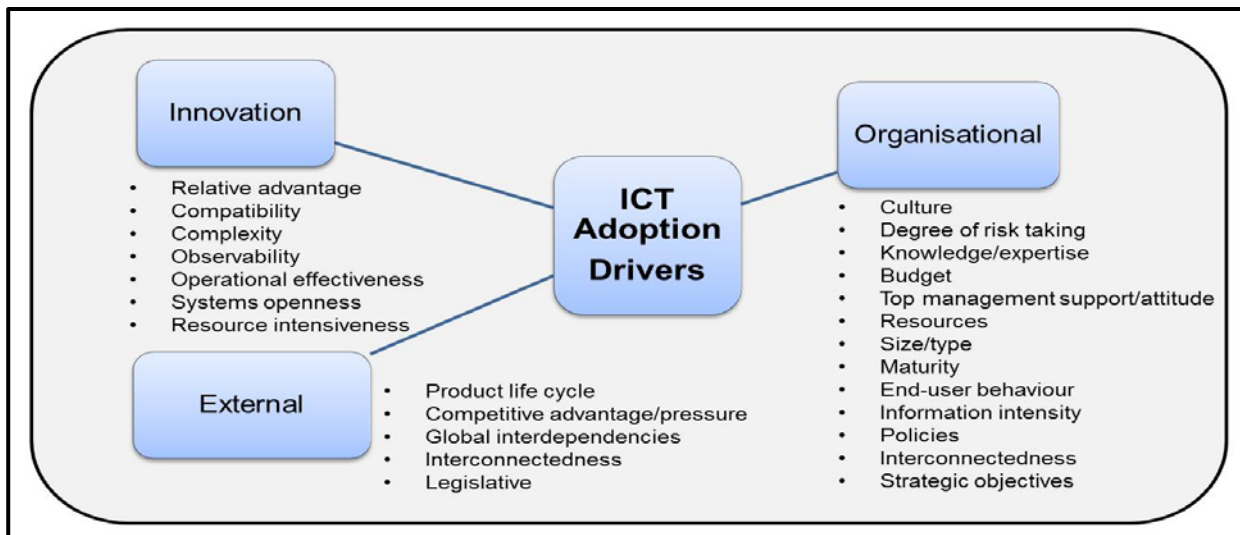
Source: Own compilation synthesised from literature articles listed in Table 5-2.

3.6.1 <u>Innovation factors</u>

Innovation is one of the drivers of ICT adoption. Innovation factors are product-related characteristics that contribute positively towards ICT adoption. Although innovative factors are important in ICT adoption, they may not always be a significant predictor of adoption, as social pressures and organisational practices may dictate otherwise. According to Garcia and Calantone (2002:112), 'innovation is an iterative process initiated by the perception of a new market and/or new service opportunity for a technology-based invention which leads to development, production and marketing tasks striving for commercial success of the invention'. Most literature articles reviewed on innovation expand on the seminal works of Everett Roger's *diffusion of innovation theory.* Using Roger's innovation theory as a basis, coupled with the information generated from literature articles presented in Table 5-2, the following factors were identified as the most important innovation characteristics to consider when adopting new technology:

- *Relative advantage:* refers to the 'degree to which an innovation is perceived as being better than the idea it supersedes'. This indicates the extent to which a potential adopter views the innovations as offering an improvement over former ways of accomplishing the same tasks.

- *Compatibility:* refers to the 'the degree to which an innovation is perceived to be consistent with existing values, past experiences and needs of potential adopters. This indicates that the technology must be suitable to the circumstances to which it is adopted.

- *Complexity:* refers to 'the degree to which an innovation is perceived as difficult to use'. This indicates that the technology is relatively easy to learn and use and that it is not overly difficult.

- *Observability:* refers to 'the degree to which results of an innovation are visible to others'. This refers to the extent to which its performance and related benefits are evident and the results demonstrable to those adopting the technology.

- *Operational effectiveness:* refers to the 'perceived usefulness' of the technology. This denotes the possibility that the technology will increase individuals' jobs performance and contribute towards overall improved outputs.

- *Systems openness:* refers to the compatibility of the technology features with other technology across diverse platforms. Preference is given to technologies that are able to integrate with other complementary technologies.

- *Resource intensiveness:* refers to peripheral technologies that are essential to derive maximum value from the adopted technology. This may extend to the hardware configuration, network topology and general system level characteristics such as security, reliability and scalability. Organisations often prefer to leverage off existing technologies in order to achieve greater value from already adopted technology.

3.6.2   <u>External factors</u>

Tidd *et al.* (in Troshani and Doolin, 2005:4) assert that a critical factor for the successful adoption of technology includes the ability of the organisation to *predict and respond* to changes in the industry. As a means of continued existence, external competitive pressures have made it compulsory for organisations to adopt ICT (Ghobakhloo *et al.*, 2012). External factors refer to industry pressures from the environment that sways decision-makers to adopt ICT because of advancement in technology innovation. Information gathered from literature indicates that the following are the most important external factors that decision-makers should consider when adopting new technology:

- *Product life cycle:* refers to the status of technology in terms of its development. Technologies that have achieved critical mass are likely to be in the mature stage, which means that little benefit can be achieved from technology and that this is likely to trigger innovation. On the other hand, technologies that have achieved critical mass may force organisations to adopt them because of user-driven demand.

- *Competitive advantage/pressure:* refers to the 'need to stay competitive and innovative as a means of survival' to outperform competitors. This contributes towards the organisations' ability to create competitive advantage, while providing value to their customers.

- *Global interdependencies:* refers to the versatility and dynamic nature of the technology in overall costs reduction among an organisation's networks. The technology is able to provide for faster communication, closer coordination across the firm's boundaries, and caters for highly decentralised networks.

- *Interconnectedness:* refers to when the value of the technology grows with the total number of users who adopt it, for example social media. The utility of the communication medium increases with the total number of users connected to the medium. When there is a critical mass of users, this has a tendency to influence the adoption of associated innovations.

- *Legislative:* refers to the 'government policies and initiatives' that promote the adoption of ICT. Government assistance in the form of financial aid and technical expertise increase the adoption of ICT.

3.6.3   Organisational factors

The adoption of new technology is a practice in which decision-makers are influenced by both the organisation's capabilities and its user network (Sieber & Valor, 2008:10). Organisational factors refer to internal aspects that set the tone for ICT adoption. The synthesis of literature articles indicates that the following are the most important organisational factors decision-makers should consider when adopting new technology:

- *Culture:* refers to the way of doing things within the organisation. Culture contributes significantly to an organisation's readiness towards change and, as such, sets the tone for the thinking and adoption of technology. Constructs of organisational culture, such

as perceived norms, values and attitudes can affect the behaviour of employees positively towards the adoption of ICT.

- *Degree of risk taking:* refers to the *uncertainty* or *riskiness* associated with the technology versus the organisation's risk *appetite*. It is natural for organisations to avoid obvious risks and, as such, may lead them to ignore technologies that do not meet the required standards. However, certain technologies may create potential competitive advantage, which may encourage organisations to adopt them despite high levels of risk. The product maturity curve may be used to determine the strength of the technology.

- *Knowledge/expertise:* refers to the skills required in order to obtain maximum benefit from the technology. To minimise costs associated with the adoption of the technology, preference is given to technologies that can leverage off internal knowledge and expertise.

- *Budget:* refers to the investment available for technology adoption. Larger budgets allow decision-makers greater flexibility with certain innovations to determine whether it would be advantageous to adopt. Organisation size and type exert an influence on the ICT investment budget. Ultimately, decision-makers still look for returns on investment when deciding to adopt technology.

- *Top management support/attitude:* refers to top management that is essential to any organisation and, as such, these managers' perceived behaviour affects all activities within the organisation. Studies indicate that successes associated with technology adoption are directly linked to top management's positive support and attitude towards the technology.

- *Resources:* refers to technical and managerial resources available to support the adoption of the technology. Development of internal skills and knowledge is vital in guaranteeing the success for the adoption of the technology. An already established internal resource base may positively influence the adoption of technology.

- *Size/type:* refers to the size of the organisation as defined by its turnover and the number of employees as an important determinant of ICT adoption. Larger firms usually have bigger investment budgets for ICT adoption, which may encourage them to adopt new technology sooner. The type of organisation also dictates the level of ICT adoption.

- *Maturity:* refers to both business maturity in terms of employee mindset towards technology adoption and the level of employee knowledge. A high requirement for technology and technology savvy users will prefer adopting technologies that are more sophisticated. The organisational level of ICT maturity will determine whether the technology adopted will be suitable to its internal environment.

- *End-user behaviour:* refers to the characteristics of ICT users, such as their knowledge of ICT, their attitude and intention towards ICT, their exposure in the use of ICT and their industry awareness, which could positively influence their attitude and acceptance towards the adoption of the technology.

- *Information intensity:* refers to organisations that rely on volumes of information either for their daily operations or for decision-making. Information-intensive organisations express a greater propensity to adopt ICT.

- *Policies:* refers to the support for the adoption of new technology that is imbued in the organisation's policies. An organisation's policies that are flexible regarding the adoption of technology indicates that ICT decision-makers are aware of technology innovations and are forward-looking in their strategic objectives, which provides for the adoption of these technologies. Policy helps regulate the formulation of effective strategies that support the adoption of technologies.

- *Interconnectedness*: refers to the systems integration with internal technology and the value derived through the adoption of new technology that can leverage off existing infrastructure. Preference is given to technologies that are not tightly coupled so that they may be easily integrated with other technologies.

- *Strategic objectives:* refers to the strategic objectives and position of the organisation in relation to its competitors. Organisations that pursue an aggressive, innovative market strategy are more likely to pursue the adoption of new technologies more regularly.

Given the above list of ICT adoption drivers, the priorities assigned to the characteristics of the various factors by practitioners are uncertain. Practitioners may assign different adoption priorities based on their past practices, job context or the strategic importance of the ICT adoption objectives. Through this study, the case organisation intends to provide empirical evidence to determine what the ICT adoption drivers are, provide insight into the ICT adoption priorities of the practitioners, and attempt to determine what practices influence ICT adoption decisions.

3.7   BARRIERS TO TECHNOLOGY ADOPTION

As much as the adoption of technology promises to bring value with strategic benefits to an organisation, past failures in competitive organisations tend to make decision-makers risk averse to adopt the very technology that promises competitive advantages. The most important challenges of adopting technology are associated with human factors. According to Russel and Hoag (2004:103), the implementation of technology adoption has mostly failed because of issues associated with user awareness, project management and the organisation's culture. Corrocher and Fontana (2008:231) state that organisations may view barriers to technology differently depending on individual characteristics, organisational function and market features, which may strongly influence adopters' behaviour. Barriers may comprise innovation, and external and organisational factors.

Barriers serve as inhibiting factors that either prevent or delay decision-makers from adopting the technology. As such, these barriers may form the basis for enabling rational decision-making among practitioners. Decisions of which, may have profound effect on shaping strategy, especially if those decisions were a result of previous misconceptions about innovation. As generated from research, Figure 3-6 highlights the key barriers to technology adoption.

Figure 3-6: Critical barriers for ICT adoption
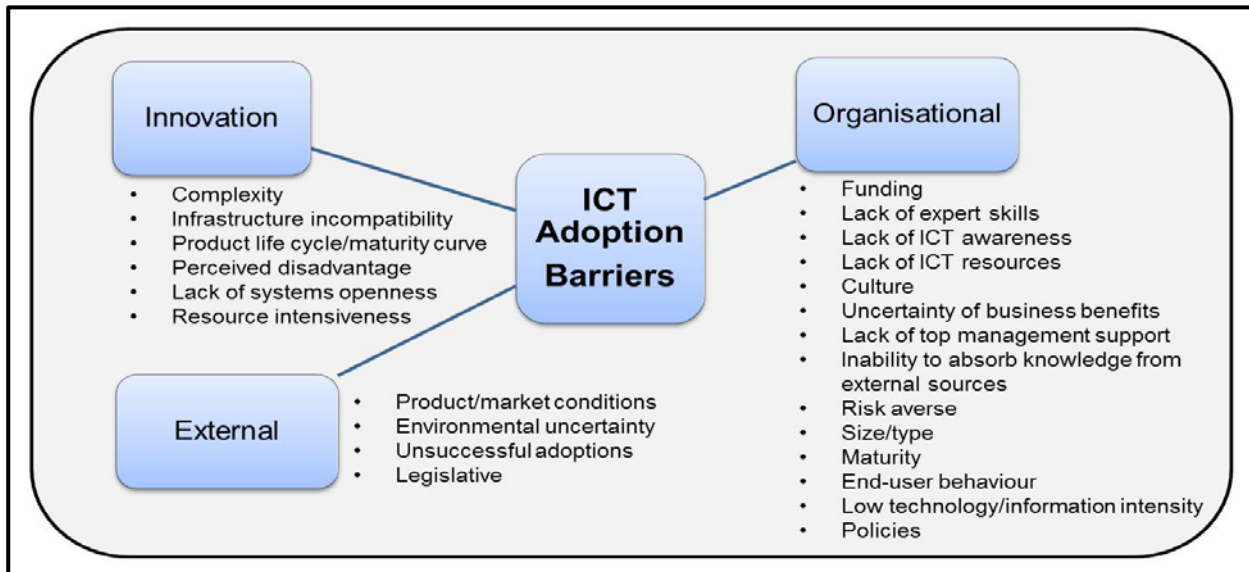
Source: Own compilation synthesised from literature articles listed in Table 5-2.

3.7.1   Innovation factors

Aspects of innovation can impede the adoption of technology. Innovation sometimes can be viewed as an unpromising opportunity, which is largely the result of imperfect knowledge (Williams & Edge, 1996:873). Unfortunately for practitioners this mindset may influence their ability to take advantage of ICT adoptions that could provide value to their day-to-day activities. The information gathered from literature indicates that the following innovation characteristics contribute towards delaying decisions in adopting new technology:

- *Complexity:* refers to 'the degree to which an innovation is perceived as difficult to use'. This indicates that the technology is demanding to learn and use, and that it is overly difficult.

- *Infrastructure incompatibility:* refers to the internal technical setup (networks, hardware, security) already established within the organisation compared to what is required for the new technology. Infrastructure establishment involves massive investments, and for strategic technologies these are mission-critical. Organisations have a tendency to avoid technologies that are incompatible with an already established internal technical

landscape, as this means that additional investment is required to adopt the new technology.

- *Product life cycle/maturity curve:* refers to the status of technology in terms of its development. Technologies that have achieved critical mass are likely to be in the mature stage, which means that little benefit can be achieved from technology and that this is likely to trigger innovation. This may lead decision-makers to avoid its adoption.

- *Perceived disadvantage:* refers to the degree to which an innovation is perceived as not being better than the idea it supersedes. This indicates the extent to which a potential adopter views the innovation as inferior to the current product in use.

- *Lack of systems openness:* refers to the indication that there is a poor level of compatibility for the technology features with other technology across diverse platforms. This indicates the degree to which the technology is not able to integrate with other complementary technologies.

- *Resource intensiveness:* refers to the indication that a greater demand for peripheral technologies is essential to derive the maximum value from the adopted technology. This may extend to hardware configuration, network topology and general system level characteristics such as security, reliability and scalability.

3.7.2   External factors

External factors refer to industry pressures from the environment that sways decision-makers not to adopt ICT. These refer to the factors within the environmental context that defines the realm in which the firm conducts its business (Ghobakhloo *et al.*, 2012:39). The information gathered from literature articles indicates that the following are the most significant external factors that delay decision-makers from adopting new technology:

- *Product/market conditions:* refers to the degree of competitive pressure that organisations experience in their environment. Markets that experience high levels of

competition require *elasticity* because of the existence of close substitutes, which drives greater innovation. Organisations experiencing constant innovation may not adopt ICT as frequently because technology obsolescence occurs more frequently.

- *Environmental uncertainty:* refers to the instability that occurs because of market conditions. Rapid changes and the advancement in technology give rise to uncertainty in the industry, which negatively affects the organisation's attitude towards adopting technology.

- *Unsuccessful adoptions:* refers to experiences and word-of-mouth from adopters regarding their failures of ICT adoption. An environment that is plagued with failures regarding particular technologies will breed contempt for the adoption of such technologies.

- *Legislative:* refers to the 'government policies and initiatives' that may hinder the adoption of ICT. Government and regulators can negatively influence the adoption of particular technologies by campaigning for alternative technologies.

3.7.3 Organisational factors

The adoption of new technology is a practice in which decision-makers are influenced by the organisation's capabilities and its user network (Sieber & Valor, 2008:10). As much as internal factors can contribute towards the adoption of technology, these same factors can serve as a hindrance, thus preventing its adoption. The information generated from literature articles indicates that the following are the most important organisational factors that delay decision-makers from adopting new technology:

- *Funding:* refers to the investment available for technology adoption. Smaller budgets restrict the flexibility of decision-makers to adopt certain innovations. Organisation size and type exert an influence on the ICT investment budget. Ultimately, technologies that are perceived to provide a poor return on investment are avoided.

- *Lack of expert skills:* refers to the skills required in order to obtain a maximum benefit from the technology. To minimise costs associated with the adoption of the technology, preference is given to technologies that can leverage off internal knowledge and expertise. The decision to adopt technology is impeded if there is a lack of internal skills to support the technology.

- *Lack of ICT awareness:* refers to a decision-maker's exposure to knowledge and visibility regarding technology innovations. Innovations engender competitive advantage via practical benefits. However, a lack of cognisance for the technology is likely to fuel concerns for adopting the technology.

- *Lack of ICT resources:* refers to technical and managerial resources available to support the adoption of the technology. The development of internal skills and knowledge is vital in guaranteeing the success for the adoption of the technology. A lack of an internal resource base may negatively influence the adoption of technology.

- *Culture*: refers to the way of doing things within the organisation. Culture contributes significantly to an organisation's readiness towards change and, as such, sets the tone for the thinking and adoption of technology. Constructs of organisational culture, such as perceived norms, values and attitudes can affect the behaviour of employees negatively towards the adoption of ICT.

- *Uncertainty of business benefits:* refers to a lack of knowledge or exposure pertaining to the technology. Most decision-makers are inclined to adopt technology that contributes towards benefits related to operational matters, for example improved productivity, efficiency and response time. If these benefits are not apparent to decision-makers then they tend to avoid the adoption of such technologies.

- *Lack of top management support:* refers to top management that is essential to any organisation and, as such, these managers' perceived behaviour affects all activities within the organisation. Studies indicate that success associated with technology adoption is directly linked to top management's positive support and attitude towards

the technology. A lack of support either hinders the decision to adopt technology or contributes towards its failure to be successfully absorbed into the organisation.

- *Inability to absorb knowledge from external sources:* refers to the lack of an organisation's ability to exploit knowledge from external sources in order to capitalise on technology innovation. This inability could stem from a shortage of internal expert technical skills or the organisation's overall inability to recognise technical opportunities.

- *Risk averse:* refers to the *uncertainty* or *riskiness* associated with the technology versus the organisation's risk *appetite*. It is natural for organisations to avoid obvious risks and, as such, may lead them to ignore technologies that do not meet required standards. Decision-makers who display risk-averse orientations towards innovation are likely to exhibit a negative outlook towards their adoption.

- *Size/type:* refers to the size of the organisation as defined by its turnover and the number of employees as important determinants of ICT adoption. Smaller firms usually have smaller investment budgets for ICT adoption and fewer employees, which may prevent them from adopting new technology. The type of organisation also dictates the level of ICT adoption.

- *Maturity:* refers to business maturity in terms of the employee mindset towards technology adoption and the level of employee knowledge. A low need for technology and users that are unaware of technology will not adopt sophisticated technologies. The organisational level of ICT maturity will determine whether the technology adopted will be suitable to its internal environmental.

- *End-user behaviour:* refers to the characteristics of ICT users, such as their knowledge of ICT, their attitude and intention towards ICT, their exposure in the use of ICT and their industry awareness, which could negatively influence their attitude and acceptance towards the adoption of the technology.

- *Low technology/information intensity:* refers to organisations that do not rely on volumes of information either for their daily operations or for decision-making. Organisations that do not have a high reliance on technology may express a lower propensity to adopt ICT.

- *Policies:* refers to the support for the adoption of new technology that is imbued in the organisation's policies. An organisations' policy that does not cater for the adoption of technology makes it difficult for decision-makers to fully comprehend the implications of technology adoption, which is why they may delay the decision to adopt technology.

Developing effective strategies are a tedious process, which may involve several practitioners, often working over lengthy periods. However, involved the process, it is of little importance if the outcome of those strategies does not consider all relevant information from participants that could bring value in shaping the outcome of the strategy. Of equal importance is the accuracy and reliability of the information informing these strategies. Through the case organisation, this study aims to obtain insight into the barriers of ICT adoption and explore the priorities placed by practitioners on these barriers. In exposing the barriers of ICT adoption, it may be possible to understand how these decisions are influenced by the day-to-day activities, which ultimately shape strategy.

3.8 TECHNOLOGY INFLUENCE ON MANAGEMENT

In view of current trends of information technology, ICT has significantly changed the manner in which organisations operate (Apulu & Latham, 2011:52). The pace of technological innovation has left managers in a spot of bother and the question weighing heavily on their agenda is how to succeed in the contemporary environment. The rapid pace of change in technology requires management to be more adaptable and responsive to derive the maximum benefit from emerging technologies. Technology adoption, especially where major ICT innovation is concerned, is not only pervasive but also influences many aspects of organisational activity (Pires & Aisbett, 2003:293). This presents a challenge to management in that they must compete with other organisational priorities.

ICT has evolved from the traditional means towards a strategic role in shaping the way business operates. Managers sometimes find out the hard way that traditional methods of managing and strategising are less effective. Although users may have had opportunities to become familiar with information technology, the rapid pace of technological adoption usually means major changes over the previous technology (Agarwal & Prasad, 1998:16). Much to managers' dismay, they have realised that new strategic responses are required, which involves a new way of thinking and the adoption of new technologies (Boynton, Victor & Pine, 1993:40). Thus, the relationship between ICT adoption and management praxis is one of shared influence and impact (Spanos *et al.*, 2002:660).

Traditionally the IT managers were seen as the technical experts. They served as a link between IT and the organisation's executives. However, in the contemporary environment their role is changing. IT managers in the contemporary context should have a multidimensional role. They should have business, strategic and political skills and a conceptual and visionary mind (Karimi, Gupta & Somers, 1996:68). The challenge that exists for managers is to take advantage of technological innovations to derive strategic value. Decision-makers need to take advantage of technology adoption as it serves as a vehicle that allows management to participate in a world of constant innovation with strategic benefits.

The practice perspective can shed valuable insight into what practitioners do, thereby exposing strategising activities at grass root level. S-as-p not only provides answers to some of the contemporary challenges facing managers in response to environmental challenges but also can be used to leverage traditional practices of strategising by focusing on the workers of strategy and organisational activities. Section 2.3 discusses the possibility of a paradigm shift in establishing new management structures in response to current business environmental dynamics. Against this backdrop the pressures of technology innovation provides a myriad of opportunities and challenges towards achieving competitive advantage and developing sustainable organisational strategies. Adding to this mix is the decisions, tools, activities, planning, budgets and the like involving strategising activities for ICT adoption that faces managers at all levels within the organisation. S-as-p provides an ideal perspective for unpacking these challenges by

focusing on the various adoption activities of the different managers, exposing their views on prioritising for ICT adoption, understanding the influence of their exposure to the technology and highlighting aspects of job context in deciding what technology to adopt. Figure 3-7 presents a framework contextualising the three ICT adoption factors with the current opportunities and uncertainties under which strategising for ICT adoption occurs.

Figure 3-7: Framework of ICT adoption in the modern context
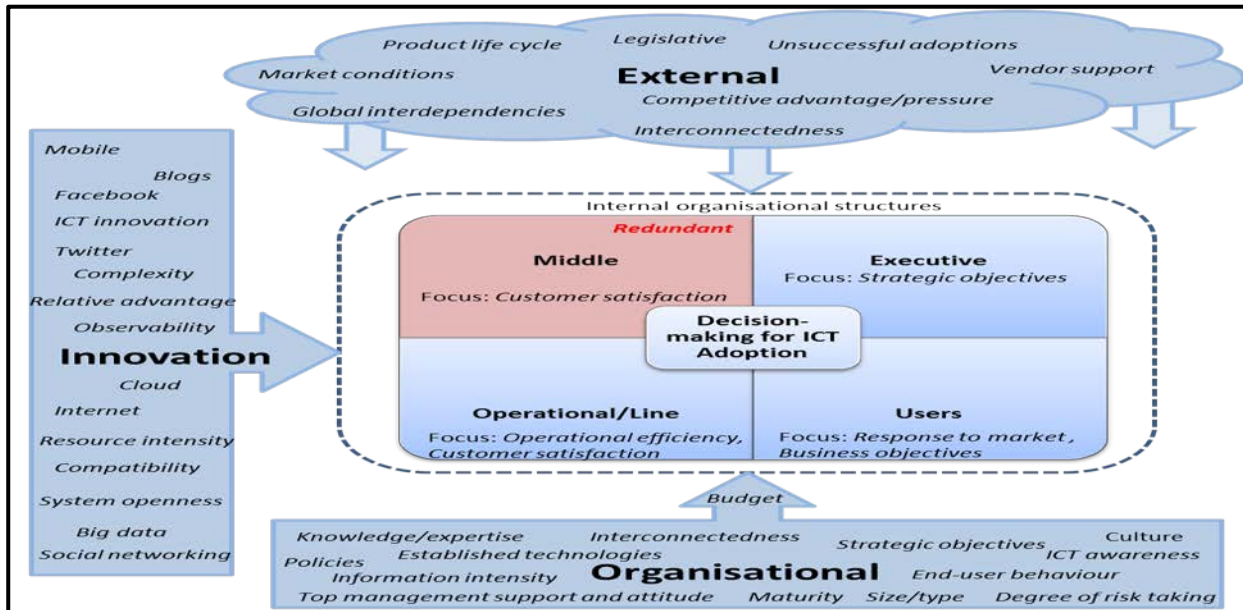
Source: Own compilation.

3.9   FUTURE ICT TRENDS THAT IMPACT MANAGEMENT DECISIONS

An analysis of the extant literature indicates that ICT has undergone important technological advancements in recent decades and that a number of similar trends are likely to continue to influence its future direction. Although ICT is a relatively new industry, most established ICT organisations have undergone significant changes in the past few years because of technological advancements.

Cloud computing, big data, mobile services and social media are rapidly changing consumer demand, which spawns innovation and development in ICT. These resulting technologies will have a significant impact on organisations. The current generation of technological users that have grown up with ICT-enabled communications and

entertainment will easily adopt similar technologies. According to the Ballarat ICT 2030 report (2011), it is difficult to predict the precise nature of ICT changes. However, most managers and decision-makers need to accept that technological changes have been advancing rapidly over the past two decades and it is apparent that there are varying degrees of *planning in the context of change* or *planning to maximise potential benefits from technological change.*

According to Grotte, Jansen, Krogh and Skogseig (2000:204), trends in the development of ICT *hardware components* can be characterised by five key dimensions, namely:

- *speed* and *capacity* (according to Moore's Law, processing power has grown, doubling every eighteen months with storage capacity showing a similar trend);
- *size* (much more integration and interconnectivity of systems);
- *efficiency* (co-operations between different systems, standards and tools); and
- *costs* (relative to the demand).

Extensive progress in software developments will improve the functionality and usefulness of ICT. The influence of these achievements will only be realised once they are integrated into the products and systems for which they were designed. However, according to Grotte *et al.* (2000:204) and Ballarat ICT 2030 (2011), what is certain is that ICT advancements will result in the following trends, which will dramatically influence management decisions:

- convergence in technologies (leading to new products and services);
- integration of different applications/procedures;
- domestication of technology into daily life;
- smaller and more portable hardware;
- telecommunications investment and digitalisation;
- altering business extent and make-up; and
- sophisticated users who become the next generation of manufacturers.

While it may be difficult to ascertain from literature the exact impact that these technology innovations will have on an organisation, it is certain that the function and the structure of management within the organisation will undergo a radical shift to adapt to these changes. Of greater consequence is the fact that practitioners may be challenged in depending on past practices to shape strategy, as these practices may not be reliable and applicable to address the speed at which decisions need to be taken. The need for managers to be agile, informed and empowered to address business issues require the creation of practices that addresses these issues and become embedded as part of their daily activities.

3.10 SUMMARY

In line with escalating pressures experienced in external environments, there exists a growing demand on managers to improve operational, tactical and strategic processes. As an ostensible choice, managers are relying on ICT adoption as a means to this end (Cooper & Zmud, 1990:123). In order for organisations to exploit the strategic benefit of ICT adoption, they should preferably align their information technologies strategy and their business strategies. However, with the rapid pace of technology advancement, it is becoming difficult to keep abreast of the latest trends to sufficiently align these strategies.

Literature indicates that the traditional approach to aligning business and technology strategies were essentially established on stable environments where managers adopted a very structured style of strategy formulation. Over the past decade, however, technology has changed the *modus operandi* of organisations. The speed of technology innovations, coupled with increasing hyperconnectivity, has contributed towards environmental instability. Thus, the traditional models adopted by organisations to develop strategies and conduct business operations have become obsolete in responding to environmental pressures. Extant research also indicates that the required approach to strategy formulation is one that can deal with the current environmental instability, while being agile and flexible to respond to the adaptive business needs. Unfortunately, literature does not provide satisfactory information on how to achieve this. By drawing on the s-as-p perspective, this study aims to provide insight through empirical evidence in understanding

strategic management, managerial activities and decision-making. S-as-p provides a unique perspective into the myriad of micro-activities that managers perform on a daily basis and by examining the strategising activities for ICT adoption of the case organisation, this study aims to determine whether strategy-making has evolved from the traditional deliberate approach towards an emergent approach.

Given the current context within which organisation operate, technology adoption is seen as the genuine source and driver in developing business strategies and can no longer be seen as an afterthought (Spanos *et al.*, 2002:661; Ogalo *et al.*, 2011:312). Used appropriately, technology adoption can enable management to close strategic gaps that may exist between the organisation and its environment. It is of crucial importance that management has an understanding of the factors that can influence the adoption of new technologies (Sultan & Chan, 2000:106). Not every technology innovation will be of strategic importance. Managers need to understand where in the technology life cycle a particular product is, and what the potential strategic benefits will be before they can decide to adopt that technology (Meade & Rabelo, 2004:669).

Various tools can assist managers in determining the stage of a particular technology. The two most popular tools used are the s-curve and the Roger's adoption life cycle model. There is copious literature available on different factors that influence the adoption of and barriers to technology adoption. However, there is insufficient information available on whether technology adoption is a choice for management. In addition, the literature study is not sufficiently expansive to indicate what the relationship between strategising and ICT adoption is. The case organisation forms the backdrop in which strategising activities for ICT adoption are explored. With the use of the s-as-p building blocks, the case organisation provides the environment in which the activities of strategising for ICT adoption by practitioners are examined. The findings can aid in providing insight into the ICT adoption priorities, -tools used, -adoption factors influencing, -job context, -exposure, - practices and environmental influences that shape strategy.

The adoption of new technology can radically affect the organisation, especially if the adopted technology is different from the internally established core technologies (Khanagha *et al.*, 2013:52). Preference is given to internally established technologies to

leverage off existing investments unless the organisation intends to capitalise on emerging technologies by pursuing competitive advantage (Khanagha *et al.*, 2013:53). Management decisions are impacted by the rate and speed of adoption. The rate of adoption relates to their need to introduce innovativeness into the organisation. Organisations with a high adoption rate indicate a higher drive for innovation towards efficiency or competitive advantage. The speed of adoption relates to the timing of when the innovation was introduced into the market. Management's approach towards the speed of adoption is either early or delayed depending on the organisational readiness and need. Organisational culture influences organisational readiness and can contribute either positively or negatively towards the adoption of technology (Johnson, 2010:161). Literature is weak on the micro-activities involved in the decision-making process for the adoption of new technology. The study aims at addressing this gap by taking the practice perspective to examine the different styles of decision-making, understand the decision-making context of the different level of managers, determine the environmental pressures relating to the speed of innovation on decision-making, and the decision-making practices that guide ICT adoption in the case organisation.

Technology adoption, especially where major ICT innovation is concerned, is not only pervasive but also influences many aspects of organisational activity (Pires & Aisbett, 2003:293). This trend is guaranteed to continue with advancements in technology. In addition to the advocacy needed to ensure the conditions necessary for technology adoption, managers must compete with other organisational priorities. As technology advances so too must the organisation to ensure its strategic survival. The critical challenge facing management is that to adequately address these changes, an organisation's structures and management roles must evolve to be flexible and agile to respond to the external environment. The literature study is clear that organisations have no choice but to adjust accordingly. This is evident from the demise of those brick and mortar organisations that refused to adapt their strategies to that of the changing environment. Literature study falls short on how to restructure management's function and the structure of organisations to cater adequately for a dynamic response to the external environment. Exploring answers that address organisational restructuring because of environmental pressures fall outside the scope of this study. However, through the case organisation, the study aids in determining empirical evidence to support the theory

discussed in section 2.3 stating that role clarification becomes an issue when responding speedily to user demands in the current business context.

Although it is evident from literature review as discussed in Chapters 2 and 3 that management activities are increasing in complexity due to ICT innovations and the adoption thereof, understanding the activities involved in strategising for ICT adoption is still unclear. As described in the introduction of this study, the value of this study is to shed insight in determining how strategising for ICT adoption shapes strategy from an s-as-p perspective.

4   RESEARCH DESIGN AND METHODS

THE RELATIONSHIP BETWEEN STRATEGISING AND ICT ADOPTION

- Chapter 1: Introduction
- Chapter 2: Strategy and management
- Chapter 3: Information and communications technology adoption
- Chapter 4: Research design and methods
  - 4.1 Introduction
  - 4.2 Research paradigm and philosophy
  - 4.3 Reason for selecting the adopted paradigm
  - 4.4 Description of inquiry strategy and broad research design
  - 4.5 Research process
  - 4.6 Sampling
  - 4.7 Data collection
  - 4.8 Response rate
  - 4.9 Data analysis procedures
  - 4.10 Assessing and demonstrating the quality and rigor of the research design
  - 4.11 Research ethics
  - 4.12 Empirical findings
  - 4.13 Summary
- Chapter 5: Paper 1
- Chapter 6: Paper 2
- Chapter 7: Paper 3
- Chapter 8: Paper 4
- Chapter 9: Conclusion
- Chapter 10: References
- Chapter 11: Appendices

4.1 INTRODUCTION

This chapter gives an overview of the research approach adopted in this study. It identifies the study's epistemology and theoretical perspective. It further reports on the research methodology and the practical approach adopted in the study. Case study was used as a research strategy, as it is differentiated by its ability to investigate the phenomenon of strategising for ICT adoption and focuses on practitioner's viewpoints and provides insight into the activities that shape strategy. This chapter rationalises the sampling strategies and the research methods used for collecting data in the case study. The chapter then looks at the quantitative analysis techniques that were used for analysing the data. It ends with an overview of positioning the empirical findings in subsequent chapters.

4.2 RESEARCH PARADIGM/PHILOSOPHY

The research strategy adopted in this study is a case study that primarily makes use of a quantitative data collection method, which was selected purposefully to describe, predict and control the phenomena through specific variables relating to strategising and ICT adoption in the sample environment. The intention was not to examine individual actors but rather aggregate actors, distinguished by their management levels to determine behaviour and relationships when strategising for ICT adoption. The primary purpose for selecting this strategy was for the creation of knowledge in understanding the activities of practitioners when strategising for ICT. The approach to inquiry was deductive in nature focusing on a 'snapshot' of the case organisation. Figure 4-1 illustrates an overview of the research philosophy and approach used in this study.

Figure 4-1: Overview of study's research philosophy and approach
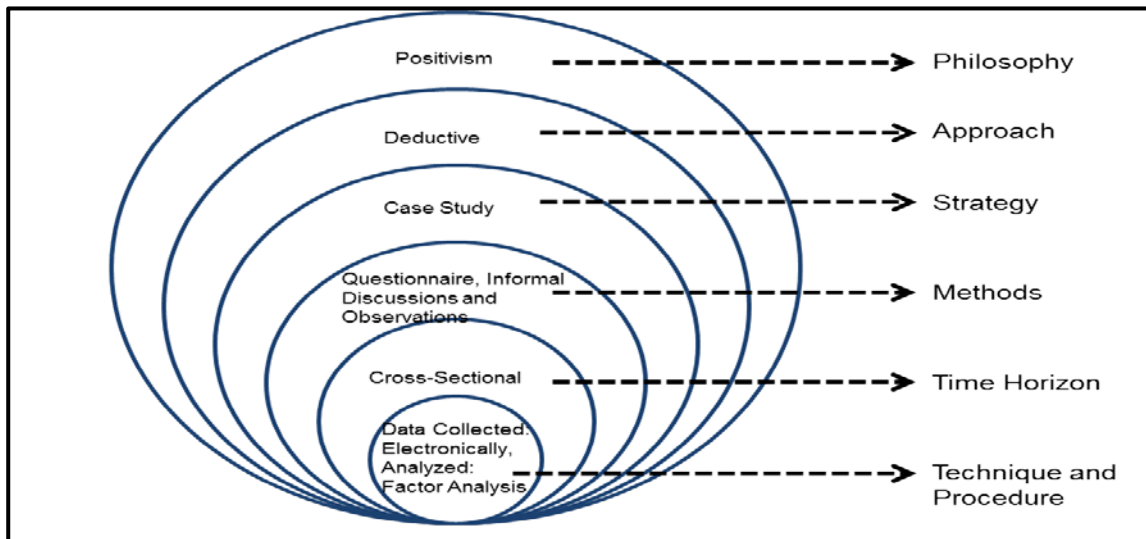
Source: Adapted from Saunders et al., (2009:108)

Ontology is concerned with the 'nature of reality' (Saunders *et al.*, 2009:110). The researcher believes that the reality is objectively given and is measurable. The researcher chose to deal with facts associated with the case organisation in context of the study. In line with this view, the research adopted a rigorous process in the design of the questionnaire, analysis and interpretation of the data with the aim of removing any personal bias that may influence the research. The design of the questionnaire was done to ensure that no unrelated information was captured from the respondents and with the use of stringent statistical methods data validity was ensured.

Epistemology is concerned with 'what constitutes acceptable knowledge in a field of study' (Saunders *et al.*, 2009:112). The researcher adopted a philosophy of positivism and preferred to work with observable phenomena that could provide credible data, where the end product of the research can be considered as law-like generalisations. However, it is important to note that the aim of the study was not to produce generalisable findings. The philosophy was adopted for the purposes of describing the strategising experience of practitioners in their day-to-day activities through measurement and to provide empirical evidence in response the study's research questions. The researcher worked primarily from a scientific paradigm, which is why informal discussions conducted with research subjects were purely to strengthen and enrich the researcher's understanding of the challenges posed to practitioners because of innovations in technology. This

understanding, together with literature on strategising and ICT adoption factors formed the basis of the questions used in the design of the instrument. Data used to develop the research instrument were based on input from theoretical information, observable facts and actual feedback gathered from the pilot study. Ultimately, the study adopted mainly quantitative methods to answer the research questions.

Qualitative (literature) and quantitative (investigation) methods were used in this study because the researcher wanted to answer questions about the complex nature of the phenomena, focusing on describing and understanding the phenomena from the point of view of the participants. Qualitative methods were used to extract as much richness from literature, observations and informal discussions on strategy-making and ICT adoption in the contemporary business context. Information gathered from informal discussions was not transcribed or recorded as it was used purely to inform the researcher's understanding on the subject matter. The information gathered collectively was used to design the questionnaire. The quantitative method of extracting data was in the form of a questionnaire.

Axiology is a branch of philosophy 'that studies judgements about value' (Mackenzie & Knipe, 2006:3; Saunders *et al.*, 2009:116). The researcher undertook the research in a 'value-free' way where the researcher was independent of the data and maintained an objective stance. However, it should be noted that the researcher is employed by the case organisation and was able to contribute towards the data gathering process (response rate) by lobbying for support from management prior to the release of the questionnaire.

4.3 REASON FOR SELECTING THE ADOPTED PARADIGM

Although most of s-as-p research is conducted through interpretative studies, the researcher selected the positivism paradigm purposively because she wanted a controlled and structured approach to conducting the research. The researcher also wanted to aggregate the responses of different managerial levels so that the study could focus on the aggregate views pertaining to strategising for ICT adoption. Additionally it allowed for the study to set specific research questions that provides answers to understanding the

practical implications of ICT adoption in the case organisation. This paradigm provided structure to the research study by allowing the researcher to firstly identify the topic, then construct appropriate research questions and finally by selecting the research methodology suitable to achieve this objective. The paradigm made it possible for the researcher to remain neutral and allowed for the findings to present conclusive results where possible.

4.4   DESCRIPTION OF INQUIRY STRATEGY AND BROAD RESEARCH DESIGN

The inquiry strategy used in this study was a *case study.* Robson (in Saunders *et al.*, 2009:145) defines case study as a 'strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence'. Yin (2003:14) indicates that a case study 'relies on multiple sources of evidence, with data needing to converge in a triangulating fashion'. The phenomenon under investigation was the various levels of management and ICT adoption factors. The method was selected so that the researcher could establish relationships between variables being measured, namely the different level of management viewpoints, ICT adoption factors, decision-making approaches, management activities and job function.

The research made use of a single case study to answer the research questions and to explain a phenomenon in a real world context where the boundaries between the phenomena and context may not be clear. This choice is supported by Yin (2003:40) in that a single case study may be used where the case is representative or typical of an everyday commonplace situation and where the case may be revelatory. The intention of selecting the particular strategy was to understand practitioners in context of strategising for ICT adoption and to interpret their actions as a single group, with the aim of answering specific research questions and identify possible opportunities for future research. The study made use of a research instrument in the form of a questionnaire to answer the research questions.

The context of the study was to gain a better understanding of the relationship between strategising and ICT adoption. Strategy is critical to an organisation's success and, as such, can determine its success or failure. Having a proper strategy is a matter of discipline and should organisations ignore the importance of having one, they will weaken their success of survival (Porter, 2001:11). Strategy formulation would be easy if the environments in which organisations operate were static. Given the fact that technology adoption is essential to an organisations' competitive strategy and the fact that technology is constantly evolving, the contemporary environment is anything but static. Thus, the qualitative study aims to gain an understanding of the effects of technology adoption on strategising from an s-as-p perspective. It further intends to understand what the demands placed on management because of ICT adoption are.

In this research study, the researcher wanted to find out not only what happens during technology adoption but also how it happens and, more importantly, why it happens the way it does. The researcher was the primary instrument for gathering and analysing data and, as such, could respond to the situation by maximising opportunities for collecting and producing meaningful information. Table 4-1 summarises the research design used in this study.

Table 4-1: The study's research design components

Description	Approach
Context	Case study in a large organisation
Key research questions	• Is ICT adoption a choice for management? • Are management roles evolving in response to their business environment? • How does strategising for ICT adoption happen in practice? • What are the factors that influence ICT adoption? • What are the organisational ICT adoption drivers? • What are the organisational ICT adoption inhibitors? • Does job function contribute towards ICT adoption decisions? • Does level of education influence decision-making for ICT adoption? • Are ICT adoption factors influenced by level of management? • Does pace of innovation influence management to adopt innovative technology sooner?
Unit of investigation/ analysis	Primary: factors influencing ICT adoption. Secondary: managerial levels.
Unit of observation	Managers at different levels with different job functions within the organisation.

Description	Approach
Logic linking the data to the propositions	The perceptions of different levels of management on how they strategise can direct an understanding of ICT adoptions.
Criteria for interpreting the findings	Literature identified key factors for ICT adoption, which was used to interpret the propositions by seeking support or no support.
* = Propositions set to structure the research process in support of the research question. Research questions are converted to statements for which support (or not) is sought.	

Source: Adapted from Yin (2003:21).

4.5   RESEARCH PROCESS

The principal aim of this paper was to identify ICT adoption factors and improve the general understanding of how to strategise for ICT adoption. Academic sources and data bases were searched with key words including *strategising for ICT adoption; ICT adoption; Rogers diffusion theory; Davis adoption theory; strategy-as-practice, disruptive technologies; emerging technologies; drivers and barriers to ICT adoption; factors influencing ICT adoption; strategy-making; technology adoption; management and ICT adoption; and ICT adoption factors and innovation challenges.* Each article was screened for relevance to determine if it contributed to ICT adoption, adoption factors or drivers, and barriers to ICT adoption. If included, it was analysed further for relevant subject matter and used in the development of the ICT adoption framework. Factor characteristics influencing ICT adoption were extracted, rationalised and classified against the three critical ICT adoption categories. When a 'seminal' article was identified, its reference for potential contributing articles was further explored.

The principles of grounded theory were adopted for developing the framework for ICT adoption factors (Corbin & Strauss, 1990, Saunders *et al.*, 2009:149), where the repetitive reading of the selected articles led the researcher to identify principal categories typically associated with drivers, barriers of ICT adoption and more. As the researcher's understanding developed and when articles did not contribute any more new knowledge, it was decided that saturation was achieved. The building blocks of s-as-p formed the backdrop in exploring the strategising activities of practitioners.

4.6   SAMPLING

The researcher made use of a representative *(probability) sampling* technique which was selected so that inferences could be made from the sample population to answer the research questions*.* The questionnaire was executed within the case organisation where only individuals in management positions and individuals with the potential to influence decisions were identified as the sample population. These individuals were identified by their job levels within the organisation. Thus, to maintain anonymity of the responses no names were requested from the respondents. Job levels were used to differentiate the different management positions. Thus, a stratified random sampling technique was used. This was purposefully done with the intention of obtaining subsets of data that was identified by the different management levels (job levels). The case organisation was ideal to conduct the study because it;

- provided accessibility to practitioners of strategy in terms on understanding their strategising activities;
- representative of modern business challenges associated with ICT adoption, business context complexities and challenges associated with sustainable strategies;
- has an ICT department which is representative of the rate at which technology is adopted; and
- has a large enough employee base that was accessible.

The data collected was used to make inferences in order to answer this study's research questions. The population of this study was a large organisation (2 272 employees) representative of an organisation in the financial and banking industry. Only permanent full-time employees were part of the target population. Participants who are directly involved in or contribute towards strategising for ICT adoption were part of the identified target population and served as the unit of observation in this study. This included executive, middle, line and operational managers employed in the organisation. Managers serve as the key decision-makers and are instrumental in decisions pertaining to ICT adoption. It is for this reason that they were selected as the primary participants for the study. In addition, selected levels of employees from the organisation who do not occupy

management positions but occupy positions of functional responsibility and who are capable of potentially influencing decision-makers, were also selected to be part of the target group. Ultimately, the sample population selected was stratified for job levels.

During the pilot test, the questionnaire was adequately tested to ensure data quality and the means of enhancing the participant response rate through simple sentence construction. The purpose of the pilot test was to determine if the sample population could identify with the context of the instrument, language used and sense-making of the types of questions asked. Substantial effort was taken to ensure content validity, relevance of the subject matter and the elimination of ambiguity in the sentence construction. Following a few amendments to the questionnaire from feedback obtained, the survey was launched online with an electronic mail message explaining the purpose of the study and assuring the respondents anonymity of their input. The survey instrument ran for a period of three weeks. The representative sample size was 1 200.

4.7   DATA COLLECTION

Although this study made use of a questionnaire as the primary data collection method to answer the research questions, it also relied on informal discussions as a means to gather information, which assisted in formulating the questions used in the questionnaire. The informal discussions focused on factors relating to ICT adoption, current organisational management 'pain points' and strategising. The purpose of the informal discussions was to gain additional information from organisational experts on the current challenges facing managers. It is important to note that the information gathered from personal observations and informal discussions were used only to strengthen the researcher's understanding of the context of the study within the case organisation. Although critical aspects were noted, no formal recordings were made of these discussions. The interpretation of the data was purely from the empirical findings. The information gathered served to confirm the information obtained from literature. Both literature and the information obtained from informal discussions formed the basis of the questions used in the research instrument.

A self-administered online questionnaire incorporating a five-point Likert scale and ranking questions was developed. The instrument was piloted amongst selected representative groups consisting of various levels of management from different decision-making streams. Feedback gathered from the pilot study was used as input to amend the questionnaire by improving the grammar, sentence construction and removal of ambiguity. The questionnaire was distributed via electronic mail using a secure and trusted website (Qualctrix) to targeted respondents from various levels of decision-making within the organisation. The questionnaire was designed so that the respondents were forced to answer all questions within a section before proceeding to the next section. This ensured that no questions were left unanswered in a section. The questionnaire also prevented the respondents from entering unnecessary or unrelated data. This guaranteed trusted, appropriate and reliable responses to the questions and ensured that no data cleansing was required.

The questionnaire contained seven parts (see appendix B) namely:

- an introduction detailing the context of the questionnaire;
- section 1: demographic questions;
- section 2: general questions identifying the importance of ICT based on Likert scales;
- section 3: decision-making questions based on Likert scales, metrics, ranking;
- section 4: management-related questions based on Likert scales;
- section 5: ICT adoption drivers and barriers based on ranking order; and
- a conclusion that thanked the respondents for their time and valuable input.

4.8 RESPONSE RATE

The questionnaire provided sufficient anonymity for the respondents to be open and honest in their responses. While the questionnaire provided a means for more accurate responses, not all respondents completed the questionnaire. As is the nature of questionnaires, respondents are subjected to participant bias. This is the limitation of the selected sampling approach. Of the 1 200 targeted respondents, only n=352 participants completed the questionnaire successfully. This indicates a response rate of 29%. Four

hundred and thirty three (433) respondents attempted to complete the questionnaire. However, after reading the introduction that set the context of the questionnaire, thirty three (33) respondents did not pursue to complete the survey. This could have been as a result of self-determined inadequate knowledge of or exposure to the subject on the side of the respondent. Any number of reasons could be speculated as to why the other 56 respondents who attempted section 1 did not successfully complete the rest of the questionnaire. This could range from lack of time, inadequate knowledge on the subject, lack of exposure to or involvement of the respondent towards the subject matter, operational issues and the like.

4.9   DATA ANALYSIS PROCEDURES

Although this study made use of a single organisation as a unit of analysis, 'data and theory triangulation' was used in analysing the data. Data gathered from informal discussions and questionnaire responses was used to extract as much richness as possible to corroborate some fact or phenomenon. Patterns were identified from the data. The online questionnaire safeguarded the reliability and accuracy of the data by preventing respondents from entering invalid or inaccurate data. This was made possible by presenting the respondents with a list of pre-defined responses for each question. This eliminated the need to clean the data, as unwarranted data was not captured. All incomplete responses were excluded from the final analysis.

Exploratory factor analysis (EFA) was undertaken and Cronbach alpha coefficients were calculated to assess the validity and reliability of the scales, so measuring the factors under investigation. As high correlations within factors were expected, an oblique rotation was executed. Descriptive statistics were calculated to summarise the sample data and correlation coefficients in order to establish relationships between the factors under investigation. Finally, an analysis of variance (ANOVA) was used to test for significant differences between means for factors under investigation. Two assumptions must be satisfied before an ANOVA can be done (StatSoft, Inc., 2013). Firstly, the residuals must be distributed normally and, secondly, the variances must be equal. Initially the data did not comply with the assumptions. However, once a Normal Blom Transformation was

performed, the data complied with the assumptions. Thus, both requirements were met. A Kruskal–Wallis test was performed on ranked raw data to allow for the comparison of more than two independent groups. Further investigation was necessary where significant differences were observed in the data. A PostHoc test was performed to do pair wise comparisons and the least square means t-test was used for this.

4.10 ASSESSING AND DEMONSTRATING THE QUALITY AND RIGOUR OF THE RESEARCH DESIGN

The researcher made use of data and theory triangulation to collaborate and validate the same fact or phenomenon. During the informal discussions on the research study, probing questions were asked to extract as much data as possible so that appropriate questions could be formulated in the questionnaire.

The online questionnaire safeguarded the reliability and accuracy of the data by preventing the respondents entering invalid or inaccurate data. This was made possible by presenting the respondents with a list of pre-defined responses for each question. However, the biggest threat to the reliability of the study's research design was response bias. This could stem from the respondents being bias in their responses to the questionnaire. Since response bias could not be avoided, the researcher structured the questionnaire in such a manner that the responses would solicit objective responses from the respondents. The other means of controlling research bias was to validate the data where possible with supporting documentation and information. This was possible as the researcher is employed in the organisation within which this study was undertaken. Only successfully completed questionnaires were used for analysis in this study.

4.11 RESEARCH ETHICS

In the context of research, *ethics* refers to 'the appropriateness of the researcher's behaviour in relation to the rights of those who become the subject of their work' (Saunders *et al.,* 2009:184). The specific ethical principles, which applied to this study, include the following:

- Confidentiality and privacy of the respondents for both the informal discussions and responses to the questionnaires were maintained. It was made abundantly clear to the respondents that the information provided would not be used against them nor would their responses be shared with anyone other than in a report that made use of the combined data (see appendix A).

- Anonymity of the respondents was upheld, as no demographic data was requested that could identify the respondents. It was also made clear that the respondents had the right not to respond to the questionnaire should they wish to do so. The research participation was a voluntary endeavour and respondents who did not respond to the questionnaire were not penalised for doing so (see appendix A).

- Consent to undertake the research survey and allow employees to participate in the research was obtained from the organisation's Chief Operating Officer. It was agreed that the sensitive findings should not be made public as strategising is a very confidential subject and organisations are unwilling to part with such information.

- The researcher's objectivity, honesty and integrity were maintained throughout the study. The credibility of the researcher contributed towards the validity and reliability of the research results.

4.12 EMPIRICAL FINDINGS

Chapters 5 to 8 present the analysis of the data in four papers. Each of the four papers addresses separate key focus areas and collectively examines the research questions set out in this study. This study's empirical findings are presented in each paper, based on the key focus and topic of the paper. Figure 4-2 graphically depicts the context of the four papers written on this study.

Figure 4-2: Context of four papers written on this study
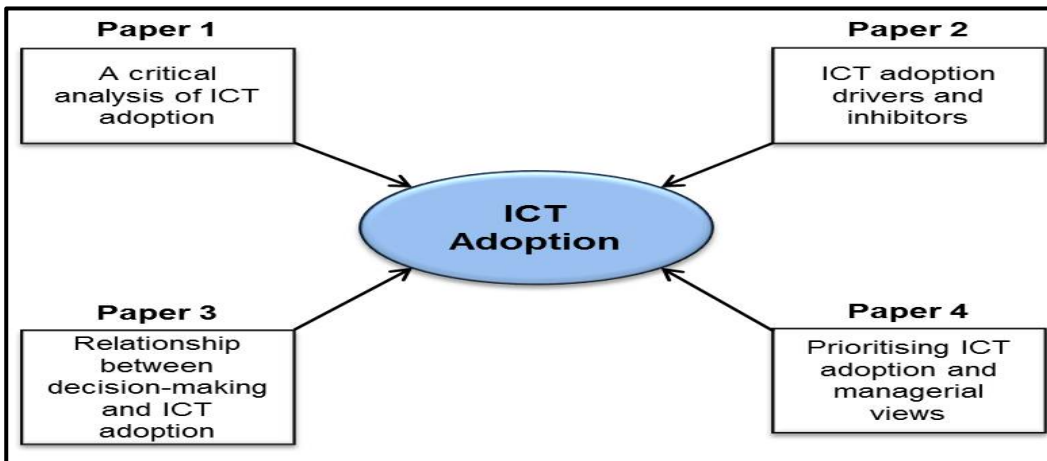
It is important to note that based on each paper's key research question, the discussion on the findings, the managerial implications, the limitations and suggestions for future research are presented independently in each of the four papers. The outcomes of the four papers are summarised in Chapter 9 of this study.

4.13 SUMMARY

This chapter has outlined the research paradigm, research methodologies, strategies and design used in this study, including procedures, data collection and analysis methods and issues relating to ethics. The research design for this study was a quantitative case study that was analysed largely through statistical methods employing factor analysis. The theory chapters of this study (Chapter 2 and Chapter 3) serve as the literature background for the papers (Chapter 5 to Chapter 8) included in this study. Chapter 5 provides a critical analysis of the ICT adoption factors and Chapters 6 to 8 provide the analysis of the empirical findings for this study. Collectively these chapters answer the research questions posed in this study. Chapter 9 expands on the overall conclusions for this study.

5   PAPER 1: A CRITICAL ANALYSIS OF ICT ADOPTION: THE STRATEGY-AS-PRACTICE PERSPECTIVE
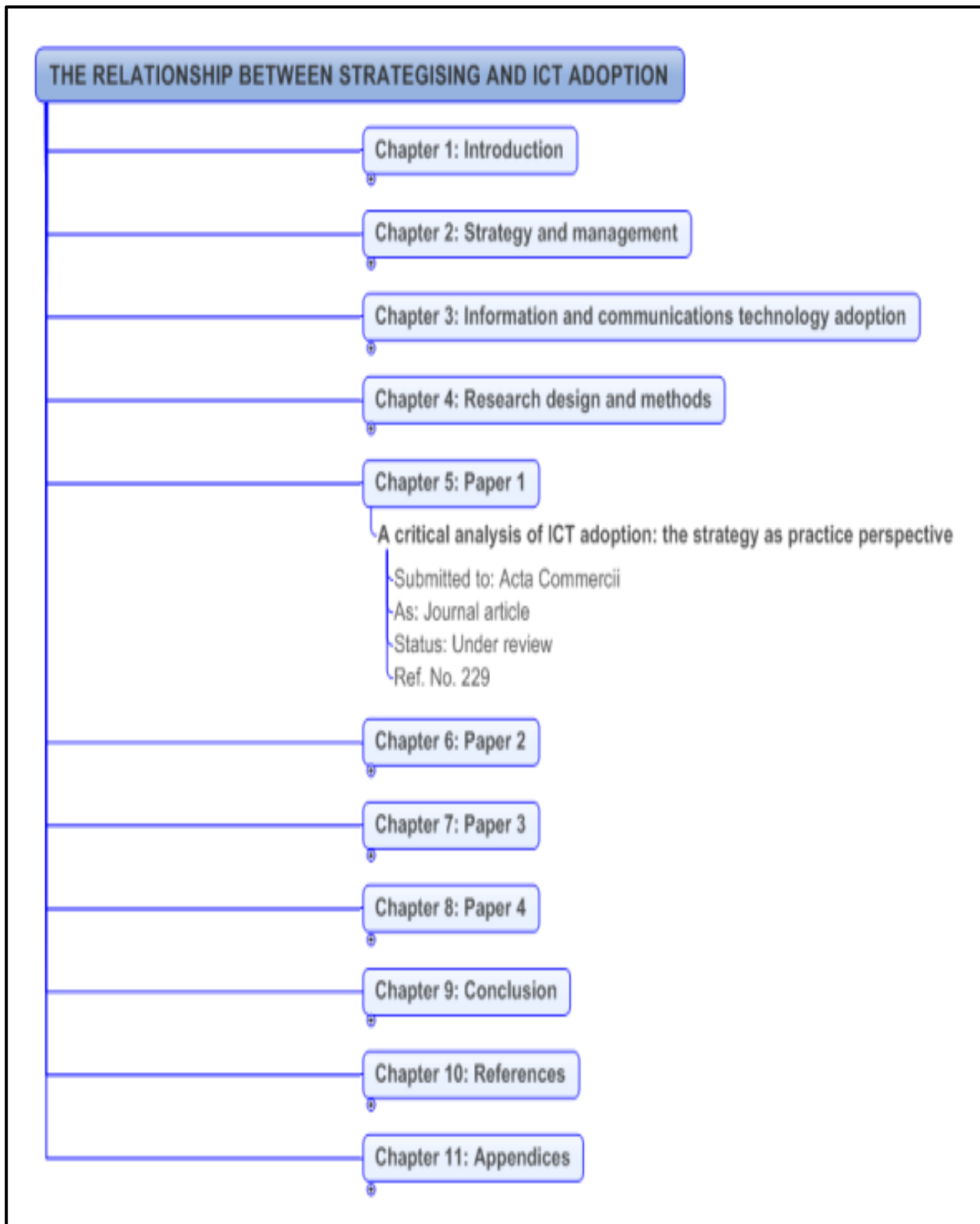
INFORMATION ABOUT PAPER 1

Title:	A critical analysis of ICT adoption: the strategy-as-practice perspective
Authors:	Pretorius, M. and Govender N. M.
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A critical analysis of ICT adoption: the strategy-as-practice perspective

Marius Pretorius

Neelambal M. Govender

Abstract

Purpose: The ubiquitous pace of innovation is spawning a multitude of ICT products that are both redefining the manner in which organisations operate and have the potential to engender organisations with strategic advantage through the adoption of these products. However, the challenges that this presents to organisations include developing agile strategies that cater for market instabilities, determining what technology to adopt, and ensuring that the appropriate technology is adopted. Thus, the purpose of this paper is to perform a critical analysis of ICT adoption in an attempt to determine the influence that the pace of technology has on organisations in their endeavour to stay abreast of their market environment and to develop a comprehensive ICT adoption framework.

Design/methodology/approach: This is an exploratory research, which concentrates on ICT adoption studies through the strategy-as-practice lens. Through critical analysis, the scientific literature was analysed to determine ICT adoption factors and to gain a better understanding of ICT adoption in the modern context. The principles of grounded theory were applied where repetitive reading of selected articles made it possible to identify factors that are associated with ICT adoption.

Findings: The study identified three key factors of ICT adoption, namely 'external', 'innovation' and 'organisational'. A number of ICT adoption characteristics were identified which were categorised against the three factors. In addition, the study identified critical management challenges associated with ICT innovation and the adoption thereof in the modern business context.

Research limitations/implications: The proposed ICT adoption framework is based on scientific literature only and no popular writings, blogs and forums were included.

Practical implications: Strategists need to understand that developing agile strategies involves more than discipline; it embraces an in-depth understanding of ICT adoption factors, insight into the daily operations of managers and an awareness of innovations in ICT.

Originality/value: The paper aims to enable organisations to better understand the effects of ICT innovation and the influence this has on management roles. Additionally, it presents a comprehensive ICT adoption framework that can aid strategists in understanding the factors that influence ICT adoption.

Key words: Strategy, Strategy-as-practice, ICT adoption, ICT innovation, Management

Introduction

Over the past decade information and communications technology (ICT) has gained prominence as a key contributor that is revolutionising the way in which organisations conduct business in response to their market environment. This is quite evident from the manner in which ICT is shaping business outcomes through social media, big data, mobile technology and cloud computing. The speed of technology advancement and innovations are the main contributors of environmental change and the cause of its instability. If technology innovations are seen as the fuel for change, then the adoption thereof may be viewed as the vehicle used by management to participate in this world of constant change, and its diffusion accepted as the drivers for success within organisations. ICT plays an enormous role in business today and there is little disagreement about its strategic business importance (Bakos & Treacy, 1986:107; Adner, 2004:25). Many authors have focused on the strategic importance of ICT and the need to align both business and ICT strategies for optimal benefit realisation. Although ICT and business strategy alignment is strategically important, of equal importance are the strategic decisions pertaining to the adoption of ICT.

Strategy is a plan that organisations intend to follow in order to achieve certain desired objectives that provide an advantage over their rivals. More importantly, it refers to the organisation's intentions and the activities it pursues for sustained existence to embrace its market environment. Strategic management deals with how organisations achieve pursued advantage through these strategies (Bitar & Hafsi, 2007:403). Since the early eighties, technology has been gaining momentum as a strategic variable and has since become a significant contributor towards the field of strategic management, providing a dominant role in the creation of corporate strategies (Friar & Horwitch, 1985:147).

Over the past decade, market environments have been disrupted mostly by ICT innovations and organisations need to evolve to adapt to these changes by creating organic structures that align with their environment (Damanpour & Gopalakrishnan, 1998; Andersen, 2001:105). In order to develop robust strategies and ultimately sustain their survival, organisations are under extreme pressure to change or adapt quickly to their environments (Ghobakhloo *et al.*, 2012:37). The question weighing heavily on executives'

minds is whether to change or alter strategies. According to Dutta and Bilbao-Osorio (2012), the global economy is not only experiencing turbulence but has also become increasingly hyperconnected. Complicating matters even further is that traditional models used by organisations to develop strategies that support business operations have become inadequate to respond timeously to market stimuli. Thus, the strategy approach required for ICT adoption is one that can potentially address instability experienced in the contemporary environment, while being agile and flexible to respond to the business needs.

The speed of change brought on by ICT innovation means faster response is required to meet market changes. In order for organisations to address this response, managers who serve as thought leaders need to find new ways of meeting this challenge. Finding answers to this challenge may help organisations better prepare to handle the dynamics in their market environment and in doing so develop advantageous strategies. Given that contemporary organisations are in uncharted waters, a paradigm shift is required where strategy-making is concerned. A new school of thought provides this paradigm shift by focusing on strategy as an 'activity' rather than a 'process' (Whittington *et al.*, 2006:618; Jarratt & Stiles, 2010:28). The critical thinking this paradigm brings to strategy-making is that unlike the traditional approach that focuses on the macro-aspects of strategy, this approach deals with the social practices of strategy (Vaara & Whittington, 2012:2). Given the importance of ICT adoption as a means to align business strategies with its environment, the focus of this paper is to analyse critically the aspects of ICT adoption. The outcome of which is to present a comprehensive framework of ICT adoption factors. Drawing from the micro-lens of strategy-as-practice the paper examines these factors to gain insight into the activities of strategising for ICT adoption.

The paper proceeds as follows, the next section presents the research question that is addressed in this paper. This is followed by a literature review of ICT adoption and associated challenges experienced in the modern business context, making use of the practice lens to expand on key issues. This is followed by the findings of ICT adoption factors, which are presented in the form of an adoption framework. The paper concludes with a discussion on the findings and recommends future research opportunities.

Research question

The principal aim of this paper is to focus on the challenges that ICT adoption presents to organisations in the modern business context, analyse current literature to identify ICT adoption factors and to develop an ICT adoption framework. The outcome of which is to improve the general understanding of how strategising for ICT adoption transpires in the modern economy. In an endeavour to increase this understanding, the paper focuses on the following research question:

What are the ICT adoption factors that shape decisions in the contemporary business environment?

In order to answer this question successfully, this paper investigates the following propositions:

- P_1 ICT adoption is not a choice for management.
- P_2 The relationship between ICT adoption and strategising is clear.
- P_3 Organisational culture directly influences ICT adoption.
- P_4 The factors influencing decision-making for ICT adoption are clear.
- P_5 Management roles are evolving in response to their environment.

Literature study

Activity theory lens:
Strategy-as-practice (s-as-p) provides a unique manner in understanding strategic management, managerial activities and decision-making. It focuses on the micro-level *social activities*, *processes* and *practices* that characterise organisational strategy and strategising (Golsorkhi *et al.*, 2010:1). S-as-p, according to Jarzabkowski *et al.* (2007:8), refers to strategising as the 'doing of strategy' and focuses explicitly on human activities. Traditionally, strategy was something that organisations *had.* However, strategy viewed from a practice perspective is viewed as something that people *do* (Jarzabkowski, 2004:529; Chia & MacKay, 2007:223). Drawing from the s-as-p perspective, ICT adoption

activities can provide insight into adoption practices, more importantly it can provide the basis for future reference in determining how ICT adoption factors influence ICT adoption decisions and how these decisions ultimately shape strategy.

The s-as-p field focuses on three building blocks that make up strategising. These are the practitioners, practices and praxis. According to Whittington (2002:c1), practitioners are the 'workers' (in the context of this study - the managers and implementers of technology adoption), practices are the 'tools' (in the context of this study - the adoption practices) and praxis is the 'work' of strategy (in the context of this study - the work of ICT adoption). Practices are seen as the 'infrastructure through which micro-strategy and strategising occurs' (Jarzabkowski, 2003:24). Strategy practitioners are 'actors', those individuals who do the work of strategy; strategy practices are the 'material tools' through which the work gets done; and strategy praxis are the 'actions' that meet the objective of the strategy (Jarzabkowski & Spee, 2009:70). S-as-p is concerned with the daily practices of individuals and identifies how these actions influence strategy (Jarzabkowski & Wilson, 2002:358). It is this view that provides valuable insight into the decisions of ICT adoption, which eventually contributes towards the organisation's strategic objective.

Management in the contemporary environment

Managers are those individuals who undertake to do the work of strategy and are seen as 'craftspeople' in the process of strategy-making (Whittington *et al.*, 2006:616). Practitioner activities should not be taken lightly because it is the activities of these individuals that contribute towards the formulation of organisation strategies that determines organisation's survival. Practitioners of strategy should not be viewed only as senior executives for whom strategy is the core focus of their work but rather to include a wider selection of actors. Although individuals at lower levels within the organisation may not have as an important title, none-the-less they are key in filtering information that contributes towards strategising activities. Managers' decisions and activities contribute greatly towards achieving the alignment between an organisation's strategies and the environment within which it operates (Goll *et al.*, 2007:162). The traditional model of strategy formulation is entrenched by a hierarchical structure that is supported by predictable and stable environments, whereas contemporary environments are dynamic with organisational structures that are supportive of middle and lower level involvement (Mantere & Vaara, 2008:342). When

compared to the traditional model, distinct management roles are becoming obsolete because of the impact of ICT on management's decision-making abilities (Drucker, 1988:3; Spanos *et al.*, 2002:662; Kearns & Sabherwal, 2006:136). Understanding how organisations react to change requires insight at an individual level (Christensen & Overdorf, 2000:1; Stensaker & Falkenberg, 2007:143).

Managers are involved in a wide range of decision-making activities that are of strategic importance to the organisation (Hendry, 2000:958; Chapman, 2001:63). Strategic issues become evident from the context within which managers engage daily and can contribute towards the strategic objectives of the organisation (Elter, 2004:6). Technological advancement plays a pivotal role in determining organisational success and, as such, organisations have increased their adoption of sophisticated technologies (Zahra & Covin, 1993:451). Technology adoption serves as a vehicle that allows management to participate in a world of constant innovation with strategic benefits. This highlights the value and importance of understanding the context of ICT adoption activities that have the potential to become organisational practices, which eventually shape strategy. The right technology adoption can contribute significantly towards the day-to-day activities of managers. Knowledge of the environment, the need that the technology will address and the skills required for the use of the technology forms the source of management decision-making.

Since the advent of technology, there have been many *latest and greatest gadgets*. Users appear to want the next new thing and they want it now. This is the same for customers and their requirements that managers have to cater for. With the arrival of the Internet, customers are much more knowledgeable, informed and empowered with information. They no longer want cookie-cut products. Customers are demanding a greater involvement and say in the products and services they receive. Managers are faced with the challenge of delivering more personalisation, better adaption, greater customisation and increased value for their products and services in much shorter time frames. This creates a vicious cycle because in catering for these requirements, managers have to look to technology adoption as a possible solution. These requirements have the potential to influence the manner in which activities are performed within the given job context. If decision-making for ICT adoption is influenced by job context then it makes sense that

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practitioners at different levels may have different viewpoints on what adoption factors are critical. Given this context, what are the key factors that managers need to consider for ICT adoption and what demands does this wield on managers' day-to-day activities? This is the key objective that this study hopes to address and in doing so develop a framework listing critical ICT adoption factors.

ICT adoption and adoption influences on strategy-making

Gartner (2008) defines *innovation* as something *new* to a group or enterprise; something that is not currently done or produced, including new ways of working. Technology *adoption* refers to the stage at which the individual or the organisation selects technology for use, whereas *diffusion* refers the stage in which technology spreads to general use and application (Carr, 2012). The success of ICT adoption is therefore generally measured by the degree of diffusion of the product within the organisation.

ICT adoption can be viewed from the activity lens as a dual sense of practice in social theory; firstly as something that is used to guide activity and secondly as the activity itself. Accordingly, 'practices' of ICT adoption refers to shared activities and behaviours including the traditional norms, methods and procedures for sense-making in selecting the technology of choice for adoption. The greater these norms become embedded within the organisation, the greater the opportunity for these norms to become practices that shape practitioner's behaviour in accomplishing the day-to-day activities. This practice may be evident when preference is always given to internally established technologies to leverage off existing investments unless the organisation intends to capitalise on emerging technologies by pursuing strategic advantage (Khanagha *et al.*, 2013:53). The rational for this behaviour is that the adoption of new technology can radically affect organisations, especially if the adopted technology is different from the internally established core technologies (Khanagha *et al.*, 2013:52).

It is crucial that management has an understanding of the factors that can influence the adoption of new technologies (Sultan & Chan, 2000:106), as not every technology innovation will be of strategic importance. Decision-making for ICT adoption by management is influenced by both the rate and speed of adoption. The rate of adoption relates to their need to introduce innovativeness into the organisation. Organisations with a

high adoption rate indicate a higher drive for innovation towards efficiency or competitive advantage. The speed of adoption relates to the timing of when the innovation was introduced into the market. Organisations may adopt a wait-and-see approach to determine the success of the innovation. Management's approach towards ICT adoption is early or delayed, depending on the organisational readiness and need. These aspects of organisational behaviour are usually dictated by the organisation's risk appetite when introducing something new to the organisation. This behaviour is usually influenced by the organisational culture, which ultimately stems for long standing social practices within the organisation. Organisational culture influences organisational readiness and can contribute either positively or negatively towards the adoption of technology (Johnson, 2010:161). Organisational readiness is also influenced by factors such as organisational policies, capital investments available for adoptive technologies, and internal practices and procedures, activities that shape the day-to-day work of strategy-making.

Strategy tools and their benefits

Managers need to understand where in the technology life cycle is the growth of a particular innovation, and what the potential strategic benefits will be before they decide to adopt the technology (Meade & Rabelo, 2004:669). The value this understanding brings to the work of managers is that it prevents managers participating in lengthy decision-making processes, only to adopt the technology that becomes obsolete soon after the decision was taken, thereby rendering the adoption useless. ICT adoption tools assist managers in decision-making activities and aid in minimising uncertainties, thereby preventing poor decisions. The use of tools from the practice lens aid in performing strategy praxis, which is all about performing the actual work of strategy-making. Four pertinent models relating to ICT adoption assist managers in activities relating to ICT adoption. These models are diffusion of innovation (DoI), technology acceptance model, s-curve and technology adoption life cycle model.

The technology s-curve is a model that is frequently used by organisations to track the technological progress of an innovation. The model was named as such because the plot of technological progress often takes an 's' shape. At the start, progress for any new technology is slow then critical mass for the technology builds as expertise in the product

increases. Eventually the technology matures where progress is slow. This is followed by an ensuing decline of the product or the start of an innovation (Asthana, 1995:49).

The technology adoption life cycle model describes the adoption or acceptance of a new product or innovation. Originally developed by Everett Rogers, this model classifies adopters of innovations into various categories namely *innovators*, *early adopters*, *early majority*, *late majority* or *laggards*. Meade and Rabelo (2004:668) later modified this model to indicate the chasm that exists between the *early adopters* and the *early majority.*

In addition to these models that track the progress of technology, numerous authors have attempted to define pertinent aspects of ICT adoption. However, most authors have expanded their technology innovation and adoption models on the seminal works of Rogers' (1995), *Diffusion of Innovation* (DoI) and Davis's (1989) *Technology Acceptance Model* (TAM), which forms the basis of the study's ICT adoption framework. Venkatesh and Davis (2000) expanded the TAM model to include 'subject norms' to determine the changes they bring with increased user experience of the target system over time. This is referred to as the TAM2 model. The DoI model posits that the adoption of innovation occurs in stages and that the adopters' decision to adopt the technology is based on their perceptions of the technology. The TAM and TAM2 models focus on adaptors' behaviours and posit that their beliefs affect their attitude for the technology that, in turn, influences their intentions and usage of the technology. Table 5-3 contains the critical ICT adoption factors and lists their characteristics. These models provide the formal analysis, in the practitioner's search for rationality and logic by minimising uncertainties in ICT adoption decision-making activities.

Drivers of ICT adoption

Decision-makers in key leadership positions are well aware that in today's contemporary environment, it is technology that is the driving change and that change demands technology (Barba-Sanchez *et al.*, 2007). Frambach and Schillewaert (2002:165), and Tarafdar and Vaidya (2006:428) assert that the degree to which an organisation is responsive to new technology will influence its tendency to adopt new technology. According to Sieber and Valor (2008:3), the main driving force behind technology adoption is no longer dependent on just the 'cost-saving' criteria or the 'automation' of tedious tasks

but rather the strategic implication it offers. In a study done by Harindranath *et al.* (2008:92), the leading strategic advantage of ICT adoption was 'keeping abreast of competitors' and benefits in operational efficiencies.

Technology adoptions are a combination of 'push' and 'pull' influences. Thong (1999:190) suggests that technology innovations can occur as a result of 'technology-push' or 'market-pull'. In 'market-pull', he postulates that a social need is felt, which gives rise to a technical demand. In 'technology-push' he asserts that a new technology is produced from an opportunity in the market, which compels the market to absorb the innovation. Both 'technology-push' and 'market-pull' influence technology adoption. According to Gartner (2008:14), the 'push' approach to innovation is expedient when an organisation wants to 'lead with technology' as opposed to the 'pull' approach which is business-led. Drivers can be viewed as a 'resource', 'process' or 'condition' that are essential for the sustained success and development of the organisation. Critical drivers are the key motives or the main force behind the need for decision-makers to adopt technology. These positive factors provide decision-makers with the impetus to adopt technology. From practice perspective, ICT adoption drivers provide the discourse that precedes the decision-making activities of ICT adoption decisions. These drivers shape the strategy decisions and inform strategy objectives.

Barriers to ICT adoption

As much as the adoption of technology promises to bring value with strategic benefits to an organisation, past failures in competitive organisations tend to make decision-makers risk averse to the adoption of the very technology that promises strategic advantages. The most important challenges of adopting technology are associated with human factors. According to Russel and Hoag (2004:103), the implementation of technology adoption has mostly failed because of issues associated with user awareness, project management and the organisation's culture. Corrocher and Fontana (2008:231) state that organisations may view barriers to technology differently depending on individual characteristics, organisational function and market features, which may strongly influence adopters' behaviour. Barriers serve as inhibiting factors that either prevent or delay decision-makers from adopting technology released in their environment. Barriers have a tendency to become more permanent practices that are often seen as predisposing negative patterns

of strategising activities. This may largely be as a result of conservative behaviours by practitioners in taking risky decisions that previously proved costly.

Research methodology

Literature was analysed using principles of grounded theory for articles reporting on strategy-making, which concentrated on key constructs of strategy, management and ICT adoption with the intention of understanding ICT adoption in the 'modern' business context. Research on ICT adoption studies were critically analysed to identify the factors that influence ICT adoption and to understand how these factors influence activities of ICT adoption. The inventory of the articles examined is presented in Table 5-2. Table 5-1 highlights the design components used in this paper.

Table 5-1: This paper's research design components

Component	Description
Research problem	To identify the factors influencing ICT adoption and to improve the general understanding of the challenges that ICT adoption presents to organisations in the modern business context.
Context	Strategising for ICT adoption in the contemporary environment.
Propositions*	P_1 ICT adoption is not a choice for management. P_2 The relationship between ICT adoption and strategising is clear. P_3 Organisational culture directly influences ICT adoption. P_4 The factors influencing decision-making for ICT adoption are clear. P_5 Management roles are evolving in response to their environment.
Unit of investigation	Factors influencing ICT adoption and strategising for ICT adoption.
Unit of analysis	Scientific literature articles.
Logic linking the data to the propositions	Literature identified key factors for ICT adoption, which form the framework for ICT adoption. Strategy-making was analysed against this framework. The resulting information was analysed against the propositions.
Criteria for interpreting the findings	Repeated mentioning in the literature of relevant factors of ICT adoption directed the focus of strategising for ICT adoption in the modern context and formed the basis for identifying key issues (focus areas) and developing an ICT adoption framework.
* = Propositions are set to structure the research process in support of the research question. Research questions are converted to statements for which support (or not) is sought.	

Source: Adapted from Yin (2003:21).

Research process

The principal aim of this paper was to identify ICT adoption factors and improve the general understanding of the challenges that ICT adoption presents to organisations in the modern business context. The reason for this 'thin description' is to guide future focus areas for in-depth research and development. The eventual proposed framework depends on the identification of the correct elements.

Academic sources and data bases were searched with key words including *strategising for ICT adoption; ICT adoption; Rogers diffusion theory; Davis adoption theory; strategy-as-practice, disruptive technologies; emerging technologies; drivers and barriers to ICT adoption; factors influencing ICT adoption; strategy-making; technology adoption; management and ICT adoption; and ICT adoption factors and innovation challenges.* Each article was screened for relevance to determine if it contributed to ICT adoption, adoption factors or drivers, and barriers to ICT adoption. If it contributed, it was analysed further for relevant subject matter and included in the tabularised findings. Factor characteristics influencing ICT adoption were extracted, rationalised and classified against the three critical ICT adoption categories. When a 'seminal' article was identified, its reference for potential contributing articles was further explored.

The principles of grounded theory were adopted (Corbin & Strauss, 1990; Saunders *et al.*, 2009:149) where the repetitive reading of the selected articles led the researchers to identify principal categories typically associated with drivers or barriers of ICT adoption and more. As the researcher's understanding developed and when additional articles did not contribute any more to new knowledge, it was decided that saturation was achieved. A list of all articles that was analysed and found to be useful was used in the establishment of the ICT adoption framework is presented in Table 5-2.

Paper contextualisation

The research question identified in this paper is part of a larger study concerning ICT adoption. Due to space limitations, this paper reports only on the theory of strategising for ICT adoption in the 'modern' context, the organisational implications thereof and on the

identification of ICT adoption factors with the intention of developing an ICT adoption framework. The proposed framework should give structure to the scattered and fragmented literature and thereby support detailed analysis in future research.

Findings

It is important to note that the analysis of the ICT adoption studies reported in Table 5-2 is largely based on Rogers and Davis's seminal works or adapted versions thereof. The critical ICT adoption factors presented in Table 5-3 were constructed from these studies and are a collaborative process, which included analysing discussions for relevance, filtering for adoption factors that support literature theory and influences stemming from modern business context. However, no one study made use of the comprehensive list of ICT adoption factors presented in Table 5-3.

Table 5-2: Literature studies on ICT adoption

Phenomena investigated/unit of investigation	Generic study focus	Participation in strategising	Type of study	Author - Year
Moderating influence on the relationship between user perception about ICT innovation and adoption decisions	Strategy, Strategising, Management	Both	Field	Agarwal & Prasad, 1998
UK retailers' adoption of EDI		Both	Empirical	Bamfield, 1994
Model for organisational structure – innovation relationships		Both	Literature	Damanpour & Gopalakrishnan, 1998
ICT adoption factors in Australian SMEs		Top down	Empirical	Fink, 1998
ICT adoption within SMEs		Both	Literature	Ghobakhloo et al., 2012
ICT adoption in UK SMEs		Top down	Empirical	Harindranath et al., 2008
Factors of adoption and usage in industrial e-markets		Both	Case	Johnson, 2010
Antecedent drivers of Internet technology adoption in small business		Top down	Field	Lee, 2004
Factors impacting the adoption of new technology in Brazil		Both	Case	Nemoto et al., 2010
Strategic importance of e-commerce adoption		Top down	Literature	Pires & Aisbett, 2003
Business factors that influence ICT adoption in banks in Thailand		Both	Empirical	Ratanapoophun & Lee, 2010
Management praxis of ICT adoption in SMEs		Both	Case	Ritchie & Brindley, 2005
ICT adoption factors and its integration		Both	Case	Shiels et al., 2003
ICT adoption criteria used by Spanish companies		Both	Empirical	Sieber & Valor, 2008
Dynamic relationships between ICT adoption and management efforts towards modernisation		Both	Empirical	Spanos et al., 2002
Resource-based view, new technology adoption attributed to sense and response by firms' capabilities		Top down	Field, Empirical	Srinivasan et al., 2002
Individual focus on adoption of new technologies within organisations		Both	Case	Sultan & Chan, 2000
ICT adoption factors in small business		Top down	Literature	Thong, 1999
Adoption factors of XBRL into an Australian company		Both	Case	Troshani & Doolin, 2005
Innovation characteristics and implementation processes in the implementation context		Both	Case	Yetton et al., 1999
Drivers for ICT adoption in Nigerian SMEs	Strategy, Strategising	Both	Case	Apulu & Latham, 2011

Phenomena investigated/unit of investigation	Generic study focus	Participation in strategising	Type of study	Author - Year
User concern and role of demographics in ICT adoption		Both	Case	Harris *et al.*, 2004
Factors influencing adoption of technology in agriculture		Top down	Case	Rubas, 2004
e-Business adoption factors in smaller firms	Strategy, Management	Top down	Literature	Fillis *et al.*, 2004
Management innovation and adoption of emerging technologies		Top down	Case	Khanagha *et al.*, 2013
Organisational structure and decision-making procedures in the adoption of innovation	Strategising, Management	Top down	Case	Cohn & Turyn, 1984
Interaction of managerial tasks with ICT and its effect on ICT adoption		Both	Empirical	Cooper & Zmud, 1990
Influence of ICT adoption factors on LAN technologies on IT managers of SMEs in Italy		Top down	Case	Corrocher & Fontana, 2008
Organisation and intra-organisation adoption decisions in marketing and management		Bottom up	Literature	Frambach & Schillewaert, 2002
Timing and intensity factors of Swiss firms' decision to adopt ICT		Both	Empirical	Hollenstein, 2004
ICT adoption rate and implementation challenges in supply chain management		Top down	Case	Russel & Hoag, 2004
Organisational factors in e-commerce adoption in India		Top down	Empirical	Tarafdar & Vaidya, 2006
Internet adoption by business in Singapore		Top down	Empirical	Teo *et al.*, 1998
Strategy-making in high-tech firms	Strategy	Top down	Case	Meade & Rabelo, 2004
IT adoption and job satisfaction in Jordanian firms	Strategising	Bottom up	Empirical	Attar & Sweis, 2010
ICT adoption in SMEs		Bottom up	Literature	Barba-Sanchez *et al.*, 2007
Impact of ICT skill constraints on ICT adoption and utilisation		Both	Empirical	Forth & Mason, 2004
Decision-making factors to adopt new technology		Both	Empirical	Gilbert *et al.*, 2004
Factors impacting the adoption of new technology		Both	Literature	Hall & Khan, 2003
Internet users' adoption of the Web for retail usage		Both	Empirical	O'Cass & Fenech, 2003
Characteristics of innovation and adoption factors		Both	Empirical	Teng *et al.*, 2002

ICT adoption factors

The ICT adoption factors listed in Table 5-3 are categorised into three key factors namely innovation, external and organisational. These three factors were selected based on their common recurrence associated with literature articles on ICT adoption and as an appropriate construct name for the characteristics of the attributes associated with the factor. These factors can be seen as drivers or barriers to ICT adoption decision-making activities depending on the context of whether the practitioners decide to adopt the technology sooner or delay the adoption of technology.

Innovation:

Innovation factors are product-related characteristics that contribute towards ICT adoption. According to Garcia and Calantone (2002:112), 'innovation is an iterative process initiated by the perception of a new market and or new service opportunity for a technology-based invention which leads to development, production and marketing tasks striving for the commercial success of the invention'.

External

Tidd et al. (in Troshani and Doolin, 2005:4) assert that a critical factor for the successful adoption of technology includes the ability of the organisation to 'predict and respond' to changes in the industry. External factors refer to industry pressures from the environment that influence decision-makers' adoption choice regarding the technology

Organisational

Organisational factors refer to internal aspects that set the tone for ICT adoption. The type and size of the organisation not only influence the strategies that practitioners develop for market efficiencies but also the day-to-day activities and the type of ICT innovation adopted given the value of the budget available.

Table 5-3: Characteristics of factors related to ICT adoption

Characteristics	Description
Innovation factors	
Relative advantage	'Degree to which an innovation is perceived as being better than the idea it supersedes'. The extent to which a potential adopter views the innovations as offering an improvement over former ways of accomplishing the same tasks.
Compatibility	'Degree to which an innovation is perceived to be consistent with the existing values, past experiences and needs of potential adopters. Organisations have a tendency to avoid technologies that are incompatible with the already established internal technical landscape.
Complexity	'Degree to which an innovation is perceived as difficult to use'.
Observability	'Degree to which the results of an innovation are visible to others'. The extent to which its performance and related benefits are evident and the results demonstrable to those adopting the technology.
Operational effectiveness	'Perceived usefulness' of the technology. Possible increase in individuals' job performance and contributes towards overall improved outputs.
Systems openness	Compatibility of the technology features with other technology across diverse platforms and the ability to integrate with other complementary technologies.
Resource intensiveness	Peripheral technologies that are essential to derive the maximum value from the adopted technology. This may extend to the hardware configuration, network topology and general system level characteristics such as security, reliability and scalability.
External factors	
Product life cycle/ market conditions	Technologies that have achieved critical mass may be avoided as they are likely to be in the mature stage. Little added value can be achieved and this is likely to trigger new innovation. Technologies experiencing constant innovation may be avoided due to technology obsolescence occurring more frequently. Rapid changes and advancement in technology give rise to uncertainty in the industry.
Competitive advantage/ pressure	The need to stay competitive and innovative as a means of survival to outperform competitors and the ability to create competitive advantage.
Global interdependencies	Is the technology able to provide for faster communication, closer coordination across firms' boundaries and cater for highly decentralised networks?
Interconnectedness	Value of the technology grows with the total number of users who adopt it, for example social media. When there is critical mass of users then the technology has a tendency to influence the adoption of associated innovations.
Legislative	Government policies and initiatives in the form of financial aid and technical expertise increase the adoption of ICT.
Unsuccessful adoptions	Implementations plagued with failures regarding technologies will breed contempt for the adoption of such technologies.
Organisational factors	
Culture	Constructs of organisational culture, such as perceived norms, values and attitudes can affect the behaviour of employees towards the adoption of ICT.
Degree of risk taking	Uncertainty or riskiness associated with the technology versus the organisations' risk appetite. It is natural for organisations to avoid obvious risks, which may lead them to ignore technologies that do not meet the required standards. However, certain technologies may create potential competitive advantage, which may encourage organisations to adopt them despite the high levels of risk associated with it.

Characteristics	Description
Knowledge/ expertise	Preference is given to technologies that can leverage off internal knowledge and expertise.
Budget	Investment available for technology adoption. Larger budgets allow decision-makers greater flexibility. Organisation size and type exert influence on the ICT investment budget.
Top management support/attitude	Studies indicate that success associated with technology adoption is directly linked to top management's positive support and attitude towards the technology.
Resources	Technical and managerial resources available to support the adoption of the technology. An already established internal resource base may positively influence the adoption of technology.
Size/type	Size of the organisation as defined by its turnover and the number of employees are important determinants. Larger firms usually have bigger investment budgets, which may encourage them to adopt new technology sooner. The type of organisation also dictates the level of ICT adoption.
Maturity	Business maturity in terms of the employee mindset towards technology adoption and the level of employee knowledge. A high requirement for technology and technology savvy users will prefer adopting technologies that are more sophisticated.
End-user behaviour	Characteristics of ICT users, such as their knowledge of ICT, their attitude and intention towards ICT, their exposure in the use of ICT and their industry awareness, could influence their attitude and acceptance towards the adoption of the technology.
Information intensity	Organisations that rely on volumes of information either for their daily operations or for decision-making express a greater propensity to adopt ICT.
Policies	Organisation's policies that are flexible for the adoption indicates that ICT decision-makers are aware of technology innovations and are forward-looking in their strategic objectives.
Interconnectedness	Systems integration with internal technology and the value derived from the adoption of new technology, which can leverage off existing infrastructure. Preference is given to technologies that are not tightly coupled for easy integration.
Strategic objectives	Strategic objectives and position of the organisations in relation to its competitors. Organisations that pursue an aggressive, innovative market strategy are more likely to pursue the adoption of new technologies more regularly.
ICT awareness	Innovations engender competitive advantage via practical benefits. However, a lack of cognisance for the technology is likely to fuel concerns for adopting the technology.
Uncertainty of business benefits	Decision-makers decline to adopt technology that does not contribute towards benefits related to operational matters for improved productivity, efficiency and response time.

Source: Adapted from articles presented in Table 5-2

Discussion and interpretation of the findings

An analysis of the above research articles as summarised in Tables 5-2 and 5-3 on ICT adoption leads to the development of the proposed framework contextualising the three ICT adoption factors with the current opportunities and uncertainties under which strategising for ICT adoption occurs, which is illustrated in Figure 5-1. The contextual framework of challenges in the modern business environment features the three adoption factors and displays the challenges and opportunities available to organisations in the context of each factor. The discussions of the findings presented in this paper, as well as the propositions proceed in accordance with Figure 5-1 as a guideline.

Figure 5-1: Framework of ICT adoption in the modern context
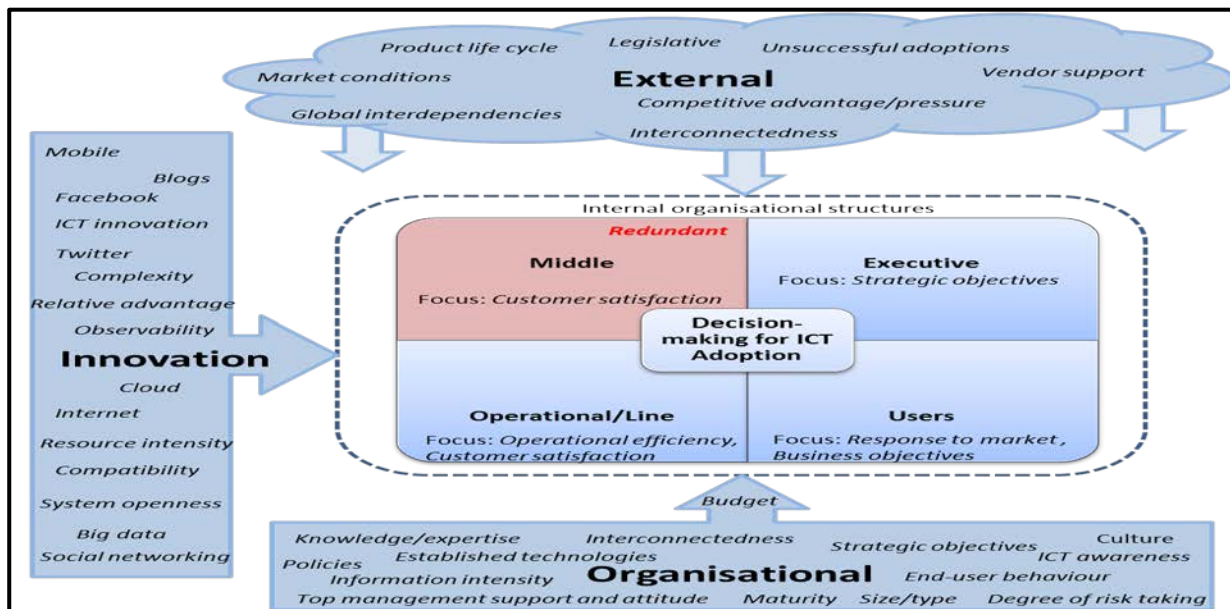
Source: Own compilation.

ICT advancements have followed the projection that Gordon Moore made in 1965 and are evolving more swiftly than ever before. The general trend of ICT is towards being smaller, cheaper, more powerful and more integrated into the daily operations of both individuals and organisations. Technology continues to overwhelmingly influence the manner in which organisations work, collaborate, communicate, interact, learn, socialise and eventually operate in almost every aspect of their dealings.

In line with the escalating pressures experienced in the external environments, there exists a growing demand on managers to improve operational, tactical and strategic processes. As an ostensible choice, managers are relying on ICT adoption as a means to this end (Cooper & Zmud, 1990:123). In order for organisations to exploit the strategic benefit of ICT adoption, they should preferably align their ICT strategy with their business strategies. However, with the rapid pace of technology advancement, it is becoming difficult to keep abreast of the latest trends to align these strategies sufficiently.

Over the past decade, technology has changed the *modus operandi* of organisations. The speed of technology innovations, coupled with increasing hyperconnectivity, has contributed towards environmental instability (Walsh, Kirchhoff, Newbert, 2002:341). Thus, the traditional models adopted by organisations to develop strategies and conduct business operations have become ineffective to sufficiently and timeously respond to market stimuli that affects strategic objectives. Extant research also indicates that the required approach to strategy formulation is one that can deal with the current environmental instability, while being agile and flexible to respond to the adaptive business needs. The greater the complexity facing organisations, the more difficult it becomes to develop appropriate strategies. Thus if complexity becomes too extensive then organisation actions become paralysed (Seidl, 2003:3) Complexity need to be minimised to achieve workable actions. S-as-p contributes towards this simplification by focusing on the micro-activities of strategising thereby providing insight into the work and practices of practitioners, which shape strategy-making.

Technology adoption serves as a vehicle that allows management to participate in a world of constant innovation. At the same time, it serves as a catalyst for fundamental changes within the organisation. However, the right technology needs to be adopted in order for organisations to reap the benefits of technological innovations. The opportunity that technology adoption presents to managers is to understand the interdependences that exist between business strategies, business rules, processes and procedures, and to determine how business can benefit from technology adoption. In capitalising on the s-as-p approach, managers can benefit greatly from its building blocks in unpacking the day-to-day micro-activities that contribute towards strategy.

Used applicably, ICT adoption can enable management to close strategic gaps that may exist between the organisation and its environment. Strategising for ICT adoption can be seen as the activity of choosing technology by selectively incorporating organisation's practices and contextual influences and with the use of specialised tools, help make sound decisions. Although various tools can assist managers in determining the phase of a particular technology to better understand the technology's potential value, technology adoption is dependent on many other factors as indicated by the adoption framework that is presented in this paper. The use of ICT is critical to the economic survival and bottom-line of organisations. Failing to participate in technology adoption creates the risk of organisations being negatively marginalised (Spanos *et al.*, 2002:659). Although technology is important in shaping strategic outcomes, extant literature is not prescriptive on what technology to adopt. This remains the prerogative of organisations as governed by the relevant adoption factors. Therefore, there is partial support for P_1 stating that ICT adoption is not a choice for management.

Given the dynamic forces at play in the market environment, managers cannot afford to delay decision-making by having complicated decision structures. Customers and clients alike expect fast turnaround times for service delivery. Hierarchical structures by their very nature imply longer turnaround times for decision-making. It is evident that with increased uncertainty and environmental challenges experienced through technological innovations and technology adoption, the approach to strategising is changing (Hart & Banbury, 1994:266; Barkema *et al.*, 2002:916). This occurs predominantly because of management's response to innovations in technology. In the current economy, strategists will not always develop strategies behind closed doors or in secret meetings. In a study undertaken by Dameron and Torset (2009) on the strategists' discourse on their practices, it was found that strategists rely on 'social interactions, complementary collaborations, intuition and action' to develop their strategies. Due to the contextual difference in organisations, insufficient support was found for P_2, which states that understanding the relationship between ICT adoption and strategising is clear.

The interplay that exists in an organisation among the various actors set the culture for the organisation, which inadvertently governs its structures, policies, practices and strategising

activities that shape strategy. Preference is always given to internally established technologies to leverage off existing investments, unless the organisation intends to capitalise on emerging technologies by pursuing strategic advantage (Khanagha *et al.*, 2013:53). Organisational culture influences organisational readiness and can contribute either positively or negatively towards the adoption of technology (Johnson, 2010:161). Management's approach and response towards the speed of adoption is either early or delayed, depending on the organisational readiness and need. There seems to be sufficient support in literature to support P_3 that organisational culture directly influences ICT adoption, and for P_4 that the factors influencing decision-making for ICT adoption are clear. Despite the above, how these factors influence decision-making warrants further investigation. Evidence of the factors influencing ICT adoption decisions is provided in the form of the ICT adoption framework, which was the outcome of this study. This is presented in Table 5-3 in this paper.

Technology adoption, especially where major ICT innovation is concerned, is not only pervasive but also influences many aspects of organisational activity (Pires & Aisbett, 2003:293). This trend is guaranteed to continue with the advancement in technology. In addition to the advocacy needed to ensure the conditions necessary for technological adoption, managers must compete with other organisational priorities. As technology advances, so too must the organisation to ensure its strategic survival. The critical challenge facing management is to address these changes adequately. An organisation's structures and management's roles must evolve to be flexible and agile to respond to the external environment. From the literature evidence, it is clear that organisations have no choice but to adjust accordingly. This is evident from the demise of those brick and mortar organisations that refused to adapt their strategies to that of the changing environment with the advent of the Internet. Thus, P_5 is supported in that management's roles are evolving in response to the organisation's changing environment. However further research is necessary to provide greater understanding on the impact this has on organisational structures.

Analysis of factors from an s-as-p view

ICT adoption can be viewed from the activity lens as a dual sense of practice in social theory; firstly as something that is used to guide activity and secondly as the activity itself. In the context of 'guiding activity', ICT adoption relates to associated practices involved in decision-making and shaping managerial views on ICT adoption. In terms of the 'activity itself', ICT adoption is associated with actions taken to accomplish the actual work of ICT adoption for example setting up of work-shops, drawing up of budget, making presentations on ICT adoption and the like.

Using the practice lens the innovation factor is largely characterised by thinking and logical sense-making stemming from the practitioners perception of the technology being adopted. The rational for this view may be a result of the practitioner's praxis, which looks to technology as a means of improving their day-to-day activities. This expectation becomes ingrained into the fabric of aggregate actor's paradigm and as a result over time may become established in organisational policies and -decision-making. Ultimately, the outcome of which has the potential to shape strategising activities for ICT adoption. The drawback of this social thinking is that sometimes perceptions may be wrong and the result of which is poor performance or costly decisions.

External factors are largely a result of market influences that shape the behaviour of organisational work that become embedded into everyday activities. Knowledge about specific types of technology, industry successes and failures relating to a technology and reputational view about a technology contributes towards establishing patterns relating to technology products. This pattern over time becomes practices that practitioners look to for guidance, which influence strategising for ICT adoption. However, differentiation and change in the use of technology become critical to achieve competitive advantage, recursive practices then presents a challenge to strategic management if practitioners are largely reliant on past practices. Thus, it becomes imperative that social practices embedded in organisations need to evolve and have adaptive characteristics which can appropriately influence ICT adoption.

The interplay that exists in an organisation among the various actors set the culture for the organisation, which inadvertently governs its structures, policies, practices and strategising activities that shape strategy. In the context of practitioner's work, activities may become localised to specific individuals whom are responsible for filtering information to decision-makers. In technology centric industries these individuals maybe specialists that although may not occupy executive positions have the ability to shape strategy. Although organisation's culture may to a large extent drive individual behaviours in work practices, sub-cultures among the user community are prone to like-minded thinking that can influence activities in decision-making for ICT adoption.

Management implications

This article contributes to an increased understanding and visibility of disruptions caused by ICT innovations and the adoption thereof. It also highlights the importance for organisations to align themselves with their environment and to leverage off successfully the benefits provided through ICT adoption. In emphasising the challenges presented by ICT innovation and the need for organisations to better align themselves with their environment, organisations can proactively relook at internal organisational structures and activities to get ahead of the disruptive ICT curve. This paper provides a comprehensive list of factors that influences ICT adoption. ICT adoption clearly provides a means for organisations to realise their strategic objectives, but it is not without risks and challenges if adopted inappropriately.

Conclusions

The intention of this paper was to analyse existing literature on ICT adoption with the intention of developing an ICT adoption framework and to strengthen the understanding of strategising in the context of ICT adoption. In doing so, the study revealed that formulating appropriate strategies are more important now than ever before. However, given the uncertainty that exists in the current environment, market opportunities and risks have transformed the manner in which strategies are formulated (Courtney, 2001:38). It is necessary for strategies to be much more flexible and adaptable to cater for the changing

nature and uncertainties experienced in the external environment, as this ensures long-term organisational sustainability. It is clear from the research that a more agile approach to strategy formulation is required. New approaches to strategy-making are necessary to reduce the complexity involved in strategy decisions. S-as-p perspective helps reduce the complexity involved in strategy-making by focusing on the micro-activities of strategising. S-as-p provides invaluable insight into the understanding of strategic management, managerial activities and decision-making. In unveiling the micro-activities involved in strategising, a better understanding is achieved on how organisations deal with the day-to-day uncertainties of the contemporary environment.

Advancements in ICT innovations contribute towards the strategic challenges that managers have to endure on a daily basis and have a significant impact on management's approach to strategising. Used appropriately, technology adoption can enable management to close strategic gaps that may exist between the organisation and its environment. In the context of technology adoption, strategising for ICT adoption can be seen as the activity of choosing appropriate technology by selectively incorporating organisation's practices and contextual influences into decision-making activities that culminate into the adoption of technology. This paper successfully compiled a comprehensive list of ICT adoption factors that can assist practitioners in informing decision-making activities for ICT adoption. It provided detailed characteristics of each factor and provided contextual understanding of how these factors can influence the manner in which practitioners view ICT adoption. ICT adoption factors can be further categorised into drivers and barriers that has the potential to predispose decision-making and hence shape strategising activities. In addition, it considered the drawbacks of past practices influencing decision-making activities in the modern context of strategy-making.

Limitations and suggestions for future research

Although this paper attempts to highlight the critical aspects of ICT adoption by synthesising extant literature on the topic, there are some limitations of the paper. ICT adoption factors have been based largely on the seminal works of Roger and Davis. New research is required to factor in the disruptive influence of radical ICT innovations and the

adoption influence on user behaviour to determine the contemporary relevance of these adoption models. Extant literature is very expansive on aligning business and ICT strategies. However, this implies that ICT contributes a supportive role to business. Whereas this may be true in some instances, it is evident from literature that ICT contributes more of a strategic role in the modern business context. This is quite evident from the manner in which ICT is shaping business outcomes through social media, big data, mobile technology and cloud computing. In addition, it is clear from the research that management roles are blurring but the extent to which this influences new organisational structures need to be explored further. A gap exists in the literature in that empirical research needs to be conducted to determine the contemporary contribution of ICT adoption towards an organisation's strategic versus operational benefit. Empirical research need to be conducted to determine the relevance of adoption factors listed in this study, in the contemporary context. Further research needs to be conducted to understand *how* the activities of ICT adoption are performed and by whom.

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6 PAPER 2: ICT ADOPTION DRIVERS AND INHIBITORS: THE PRACTICE TURN

THE RELATIONSHIP BETWEEN STRATEGISING AND ICT ADOPTION

Chapter 1: Introduction

Chapter 2: Strategy and management

Chapter 3: Information and communications technology adoption

Chapter 4: Research design and methods

Chapter 5: Paper 1

Chapter 6: Paper 2

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Chapter 7: Paper 3

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ICT adoption drivers and inhibitors: the practice turn

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Neelambal M. Govender

Abstract

Purpose: Globalisation has created increased opportunities for ICT innovation and the resulting developments are spawning a multitude of ICT products that are redefining the manner in which organisations operate, while at the same time also creating opportunities to engender organisations with strategic advantage through the adoption of these products. The challenges presented to organisations are identifying what technology to adopt and how to ensure that the appropriate technology is adopted. In order to expound the understanding of adoption factors that influences technology adoption, this paper identifies the ICT adoption drivers and inhibitors in a financial institution, which served as the case study for this paper. These factors were examined against the ICT adoption framework to determine their relevance and items within each factor is explored further from an s-as-p perspective to gain a better understanding of the activities involved in ICT adoption. The paper aims to enlighten organisations with a better understanding of ICT adoption drivers and inhibitors and their influence on strategic objectives.

Design/methodology/approach: The inquiry strategy used in this paper was a case study. Using a deductive approach, this empirical study made use of factor analysis to identify the adoption drivers and inhibitors. These factors were measured for relevance against the adoption framework and the items within the factors were analysed using the building blocks of s-as-p perspective.

Findings: The empirical findings proved the relevance of the factors against the adoption framework and factors items reveal insight into the strategising activities for ICT adoption.

Research limitations/implications: The paper only focused on one case study.

Practical implications: ICT adoption factors can provide insight into the decision-making activities for ICT adoption. Strategising takes place at all levels with the organisation.

Originality/value: The paper aims to strengthen the understanding of strategising for ICT adoption.

Keywords: Strategy, Strategy-as-practice, ICT adoption, ICT innovation, Management

Introduction

Strategic management is concerned with how organisations pursue supremacy over their competitors through their strategies (Bitar & Hafsi, 2007:403). Since the early eighties, information and communications technology (ICT) has gained momentum as a strategic variable, has become a substantial contributor towards the field of strategic management and is fundamental in the formulation of organisations' strategies (Friar & Horwitch, 1985:147). ICT is instrumental in performing business operations and is strategically important in accomplishing business objectives (Bakos & Treacy, 1986:107; Adner, 2004:25). ICT is increasingly altering the business landscape and has gained a reputation for modernising the manner in which organisations conduct business. Innovations that contribute to this modernisation largely stem from technology developments in social media, big data, mobile technology and cloud computing and will continue to do so for some time into the future. The speed of technology progress and ICT developments are the key contributors to environmental change and the reason for its unpredictability (Chakravarthy, 1997:69). If technology innovations are seen as the fuel for change, then the adoption thereof may be viewed as the vehicle used by management to participate in this world of constant change, and its diffusion accepted as the drivers for success within organisations.

Environmental instability coerces organisations to change or align their strategies through the formation of organic structures in response to changes in their environment (Damanpour & Gopalakrishnan, 1998; Andersen, 2001:105; Ghobakhloo *et al.*, 2012:37). As a means of addressing environmental influences organisations' look to ICT adoption as a means of accomplishing this objective. Thus, the quandary posed to organisations is recognising the factors that contribute towards ICT adoption. Adding to this complexity, the global economy is not only experiencing turbulence but has become increasingly hyperconnected (Dutta and Bilbao-Osorio, 2012). Therefore, the strategy practice required for ICT adoption is one that can address uncertainty experienced in the modern environment, while being responsive and flexible to meet business requirements.

Modern organisations are in unfamiliar territory where strategy-making is concerned, which calls for a new approach to developing strategies. A new school of thought that focuses on

strategy as an 'activity' rather than a 'process' (Whittington *et al.*, 2006:618; Jarratt & Stiles, 2010:28) is ideal to address this challenge. Unlike previous approaches to strategy-making, which focused on the macro-aspects of strategy, this approach deals with the social practices of strategy (Vaara & Whittington, 2012:2). Given the significance of technology adoption to align business strategies with environmental forces, the emphasis of this paper is to determine the relevance of the ICT adoption factors against the identified framework and to expose the critical ICT adoption drivers and inhibitors that are specific to the case organisation. Additionally, the paper examines the items within the identified categories of adoption factors from the practice perspective to garner insight into the activities of ICT adoption. The paper aims to both confirm the relevance of the ICT adoption factors and empower organisations with a better understanding of ICT adoption. Additionally, it highlights the potential influence of ICT adoption factors on strategic objectives.

Research question and objectives

In this study, s-as-p provides the framework for which the micro-activities of strategising are explored in detail in order to determine how these activities contribute towards ICT adoption. In keeping with the focus area for this paper as identified in Table 1-1, this paper attempts to answer the following study's overall research question:

What are the ICT adoption drivers and inhibitors that can potentially influence strategic objectives in the context of the case organisation?

In order to answer this question successfully, this paper identifies the following objectives:

- Determine the relevance of the ICT adoption factors against the ICT adoption framework.
- Identify the ICT adoption drivers and inhibitors that can potentially influence strategic objectives in the context of the case organisation.
- Examine the factors items to understand the strategy-making activities involved in ICT adoption using s-as-p as key building blocks.

In achieving these objectives, this study aims to investigate the following propositions:

- P$_1$ ICT adoption drivers allow for the adoption of technology sooner.
- P$_2$ ICT adoption drivers enable organisational readiness towards better decision-making for ICT adoption.
- P$_3$ ICT adoption inhibitors delay the adoption of technology.
- P$_4$ Day-to-day activities influence strategising actions for ICT adoption.

Figure 6-1 depicts graphically the framework of the study's objective within the case organisation.

Figure 6-1: Key aspects of research objective
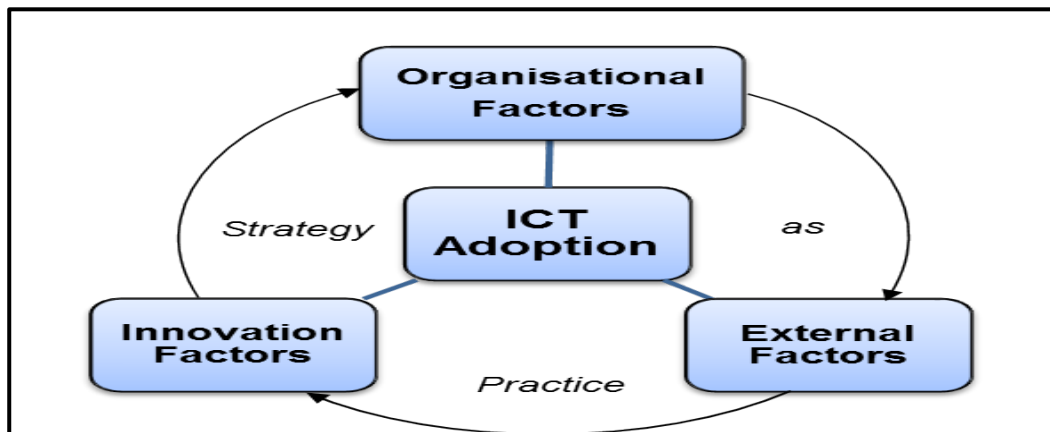
Source: Own compilation.

Literature study

Background

The principal activities of strategy formulation are identifying possible opportunities and threats in the market environment to determine, amongst others, the organisation's strategic direction. The traditional paradigm of strategy formulation does not encompass business environments with increasing levels of turbulence and instability (Chakravarthy, 1997:69; Spanos *et al.*, 2002:661). However, in the modern context of strategic management this is a common occurrence and dictates that for the effective response for a long-term organisation's strategic success, monitoring of the organisation's external environment is paramount (Ansoff & Sullivan, 1993:12). Ansoff defines 'environmental

turbulence' in terms of 'complexity of the environment, speed of change relative to possible speed of response, visibility of the future and the predictability of the future' (Sullivan, 2002:44). ICT innovation is a critical contributor to environmental instability and is identified through innovations of 'disruptive' technologies that render organisation's existing technologies obsolete (Danneels, 2004:248). In view of this, executives, strategists and managers are focusing their attention on ICT adoption for opportunities in competitive advantage and more so to close the strategic gap that exist between the organisation and its environment. As such, strategic planning for ICT requirements has become essential to support the organisation's objectives in response to market competition. Organisation's strategic ICT requirements, together with external market influences form the critical drivers and inhibitors of ICT adoption. Against this context, identifying drivers and inhibitors to ICT adoption become critical, as identifying the incorrect adoption factors can negatively influence the sustainability of the organisation.

Strategy-as-practice (s-as-p)

S-as-p refers to strategising as a process of strategy and focuses on individual tasks (Jarzabkowski *et al,* 2007:8). It is concerned with the micro-level *social activities*, *processes* and *practices* that describe organisational strategy and strategising (Golsorkhi *et al.*, 2010:1). Until recently, strategy was something that organisations *had.* However, from an s-as-p practice perspective it is seen as something that people *do* (Jarzabkowski, 2004:529; Chia & MacKay, 2007:223)*.* Although an emergent approach, it provides valuable insight into understanding the practices and social activities in the context of organisational structures. By concentrating on the daily practices of people, how these actions influence strategy are revealed (Jarzabkowski & Wilson, 2002:358). Unpacking these activities can provide valuable insight into ICT adoption activities that influence organisations' to adopt technology thereby contributing towards organisation's strategic objective. S-as-p consists of three building blocks that embody strategising, namely the practitioners, practices and praxis. Practitioners are the 'workers', practices are the 'tools' and praxis is the 'work' of strategy (Whittington, 2002:c1).

Strategy practitioners are the 'actors', those who do the work of strategy. In periods of extreme instability cognitive frames becomes central to strategising, as actors attempt to make sense of the uncertainties experienced in the business environment (Kaplan, 2008:

731). Practitioners may include individuals at all levels with the organisation even those who do not occupy executive positions, especially those who engaged in specialised activities, as they may be responsible for filtering information to decision-makers.

Strategy praxis are the 'actions' that conclude the objective of the strategy (Jarzabkowski & Spee, 2009:70). Praxis includes works like conducting workshops, building power point presentations, drafting budgets, setting up meetings and completing documents (Whittington, 2003:117). Activities that should not be taken lightly. In the context of ICT adoption, a simple task like drawing up of budgets can contribute immensely towards realising competitive advantage, as it drives adoption decisions in the amount of capital to invest and the type of technology to adopt.

Strategy practices are regarded as the 'infrastructure through which micro-strategy and strategising occurs' (Jarzabkowski, 2003:24), these are the 'material tools' through which work is achieved, commonly referred to as the tools, procedures and routines that are adopted into daily work activities. Strategy tools assist practitioners to minimise uncertainties associated with strategy-making. Practitioners should make use tools as a means to align various individual viewpoints and different contexts and not to rationalise decision-making (Jarzabkowski & Kaplan, 2006:34) because incorrect assumptions can lead to poor ICT adoption decisions . What people do is tightly connected to what they know similarly, establishing IT capabilities in an organisation are realised through the manner in which individuals communicate and generate new ideas. In an organisation for IT capabilities to contribute towards strategic objectives, they must become embedded in practices (Arvidsson, Holmstrom, Lyytien, 1996).

The role of ICT adoption and ICT strategy
Technology development may result from *new* knowledge in ICT or from changes in the market that present a gap for the development of a *new* technology (Ende & Dolfsma, 2005:85)*.* The availability of technologies through innovation does not mean that it will automatically add strategic value to an organisation. Technologies must be adopted by the organisation first before they can add value, improve efficiencies or address strategic objectives. Ward and Peppard (in Silvius, 2009:3) define ICT strategy as the 'prioritising and selection of IT projects, based on their benefits and added value to the organisation'.

Understanding the adoption activities, -processes and –practices strengthens the understanding of why and how a particular technology came to be adopted into the organisation. However, in order to understand the activities, processes and practices associated with ICT adoption, the potential factors that influence ICT adoption need to be acknowledged. Managers agree that although ICT is a significant source of strategic advantage, ICT strategies may also be viewed as functional strategies and should respond to the selected business strategy (Venkatraman *et al.*, 1993:140). ICT adoption strategies are critical to the development of business strategies and organisations cannot afford to view them as an afterthought (Spanos *et al.*, 2002:661; Ogalo *et al.*, 2011:312). . Additionally, the development of an organisation's ICT policies, which are consistent with business strategies, becomes essential for the support of ICT adoption. Ultimately, technology adoption is a result of demand or supply forces experienced in the market.

Contextual activities influencing ICT adoption

The formulation of organisational strategy is a process that is inseparable from its structure, its behaviour and its culture. The practice perspective postulates that it is through the constant and repeated nature of day-to-day activity that structural outcomes are generated and become either reinforced or changed over time (Golsorkhi *et al.*, 2010:24). S-as-p focuses primarily on contextual analysis of activities and practices that comprise of strategising in a given context. Given this view, s-as-p becomes ideally suited to explore the activities of ICT adoption because ICT adoption decisions largely stems from contextual discourses that drive strategic objectives.

Technology disruptions in operational efficiencies occur when the new technology is different from already established core technologies. Therefore, organisations prefer ICT adoption that is compatible with internally established stable technologies to leverage off existing investments, unless they intend to capitalise on emerging technologies by pursuing strategic advantage (Khanagha *et al.*, 2013:53). When adopting technology, management decisions are further influenced by the rate and speed of adoption. The rate of adoption relates to their need to introduce innovativeness into the organisation, whereas the speed of adoption relates to the timing of when the technology was introduced into the market. Organisations that are risk averse may adopt a wait-and-see approach to determine the success of the innovation prior to its adoption. Depending on the

organisation's readiness or requirement for ICT adoption, managers' approach to adoption is early or delayed. It is important that management has an understanding of factors that can influence the adoption of new technologies (Sultan & Chan, 2000:106) as not every innovation will be strategically important.

ICT is often regarded as skills-based and many empirical studies have been conducted on the complementary relationship between the use of ICT and the demand for skilled workers. Literature posits that qualified workers increase organisational readiness because educated adopters of ICT are inclined to be more innovative (Bayo-Moriones & Lera-Lopez, 2007:352). According to Chun (2003:1), a highly educated workforce may lead to the earlier adoption of new technology. The relationship between skilled workers and the early adoption of ICT may be directly linked to job context because technology-centric organisations demand a greater adoption of technology that, in turn, requires highly skilled workers. Information-intensive organisations tend to increase their use and adoption of ICT (Weber & Kauffman, 2011:683), which may be a direct influence of job context.

Given the uncertainties that exist in formulating contemporary strategies, strategy practitioners make use of strategy tools to aid in the collaboration of discourses from various management levels. Decision-makers when determining the progress of an innovation frequently use technology models like the technology-curve and the adoption life cycle model. It is imperative that managers understand where in the technology life cycle a particular product is and what the potential strategic benefits are before they decide to adopt the technology (Meade & Rabelo, 2004:669).

Drivers of ICT adoption
Drivers are seen as a resource, process or condition that is essential for the sustained success and development of the organisation. Drivers are the key motives behind the need for decision-makers to adopt technology and are the result of an organisational need. These positive factors provide decision-makers with the motivation to adopt technology and may include characteristics across one or more of the ICT adoption factors. Frambach and Schillewaert (2002:165) and Tarafdar and Vaidya (2006:428) state that the degree to which an organisation is receptive to new technology will influence its propensity to adopt new technology. Organisations with a high adoption rate indicate a higher drive for

innovation towards efficiency or pursued advantage. The main driving force behind ICT adoption is no longer dependent on just the 'cost-saving' criteria or the 'automation' of tedious tasks, but rather the strategic implication it offers (Sieber and Valor, 2008:3; Harindranath *et al.* 2008:92). From the practice perspective, organisational practices, culture and activities shape the strategic direction of the organisation thus; these influences also serve as drivers towards ICT adoption decisions.

Barriers of ICT adoption

Barriers serve as inhibiting factors that either prevent or delay decision-makers from adopting technology. Although technology adoption provides assurance to deliver value with strategic benefits, previous ICT adoption disappointments tend to make decision-makers risk averse to adopting the very technology that promises strategic advantages. Significant challenges of adopting ICT are associated with people aspects. The adoptions of ICT when unsuccessful are usually associated with issues arising from user awareness, project management and the organisation's culture (Russel and Hoag, 2004:103). Patterns in activities of which when repeated become practices that form the cornerstone of inhibiting factors that delay the adoption of technology. Corrocher and Fontana (2008:231) assert that organisations may view barriers to technology differently contingent on individual characteristics, organisational function and market features, which may strongly affect adopters' behaviour. Thus, adoption barriers like adoption drivers may include characteristics across one or more of the ICT adoption factors.

ICT adoption framework

The ICT adoption framework presented in this paper is the outcome of paper 1 (presented in this study as Chapter 5), and consists of three critical factors namely innovation, external and organisational. These factors together with their key characteristics are depicted in Table 6-1, Table 6-2 and Table 6-3 below.

Innovation factor

These product-related characteristics contribute towards ICT adoption. According to Garcia and Calantone (2002:112), 'innovation is an iterative process initiated by the perception of a new market and/or new service opportunity for a technology-based invention, which leads to development, production and marketing activities striving

towards its commercial success'. Table 6-1 contain characteristics of critical innovation adoption factors.

Table 6-1: Innovation ICT adoption characteristics

Characteristics	Description
Relative advantage	'Degree to which an innovation is perceived as being better than the idea it supersedes'. The extent to which a potential adopter views the innovations as offering an improvement over former ways of accomplishing the same tasks.
Compatibility	'Degree to which an innovation is perceived to be consistent with the existing values, past experiences and needs of potential adopters. Organisations have a tendency to avoid technologies that are incompatible with the already established internal technical landscape.
Complexity	'Degree to which an innovation is perceived as difficult to use'.
Observability	'Degree to which the results of an innovation are visible to others'. The extent to which its performance and related benefits are evident and the results demonstrable to those adopting the technology.
Operational effectiveness	'Perceived usefulness' of the technology. Possible increase in individuals' jobs performance and contributes towards overall improved outputs.
Systems openness	Compatibility of the technology features with other technology across diverse platforms and the ability to integrate with other complementary technologies.
Resource intensiveness	Peripheral technologies that are essential to derive the maximum value from the adopted technology. This may extend to the hardware configuration, network topology and general system level characteristics, such as security, reliability and scalability.

Source: Own compilation.

External factor

Tidd *et al.* (in Troshani and Doolin, 2005:4) assert that a critical factor for the successful adoption of technology includes the ability of the organisation to 'predict and respond' to changes in its industry. External factors refer to environmental industry pressures that influence decision-makers' adoption choice regarding the technology. Table 6-2 contains characteristics of the critical external adoption factors.

Table 6-2: External ICT adoption characteristics

Characteristics	Description
Product life cycle/ Market conditions	Technologies that have achieved critical mass may be avoided, as they are likely to be in the mature stage. Little added value can be achieved and this likely to trigger innovation. Technologies experiencing constant innovation may be avoided due to technology obsolescence occurring more frequently. Rapid changes and advancements in technology give rise to uncertainty in the industry.
Competitive advantage/pressure	Need to stay competitive and innovative as a means of survival to outperform competitors and the ability to create a competitive advantage.
Global interdependencies	Is the technology able to provide for faster communication, closer coordination across firms boundaries and cater for highly decentralised networks?

Characteristics	Description
Interconnectedness	Value of the technology grows with the total number of users who adopt it, for example social media. When there is a critical mass of users then the technology has a tendency to influence the adoption of associated innovations.
Legislative	Government policies and initiatives in the form of financial aid and technical expertise increase the adoption of ICT.
Unsuccessful adoptions	Implementations plagued with failures regarding technologies will breed contempt for the adoption of such technologies.

Source: Own compilation.

Organisational factor

These internal organisational aspects set the pace for ICT adoption. Table 6-3 contains characteristics of critical organisational adoption factors.

Table 6-3: Organisational ICT adoption characteristics

Characteristics	Description
Culture	Organisational culture influences organisational readiness and can contribute either positively or negatively towards the adoption of technology (Johnson, 2010:161). Constructs of organisational culture, such as perceived norms, values and attitudes can affect the behaviour of employees towards the adoption of ICT.
Degree of risk taking	Uncertainty or riskiness associated with the technology versus the organisation's risk appetite. It is natural for organisations to avoid obvious risks, which may lead them to ignore technologies that do not meet the required standards. However, certain technologies may create potential competitive advantage, which may encourage organisations to adopt them despite the high levels of risk associated with it.
Knowledge/ expertise	Preference is given to technologies that can leverage off internal knowledge and expertise.
Budget	Investment available for technology adoption. Larger budgets allow decision-makers greater flexibility. Organisation size and type exert influence on the ICT investment budget.
Top management support/attitude	Studies indicate that success associated with technology adoption is directly linked to top management's positive support and attitude towards the technology.
Resources	Technical and managerial resources available to support the adoption of the technology. An already established internal resource base may positively influence the adoption of technology.
Size/type	Size of the organisation as defined by its turnover and the number of employees are important determinants. Larger firms usually have bigger investment budgets, which may encourage them to adopt new technology sooner. The type of organisation also dictates the level of ICT adoption.
Maturity	Business maturity in terms of the employee mindset towards technology adoption and the level of employee knowledge. A high requirement for technology and technology savvy users will prefer adopting technologies that are more sophisticated.
End-user behaviour	Characteristics of ICT users, such as their knowledge of ICT, their attitude and intention towards ICT, their exposure in the use of ICT and their industry awareness, could influence their attitude and acceptance towards the adoption of the technology.
Information intensity	Organisations that rely on volumes of information either for their daily operations

Characteristics	Description
	or for decision-making express a greater propensity to adopt ICT.
Policies	An organisation's policies that are flexible for the adoption indicates that ICT decision-makers are aware of technology innovations and are forward-looking in their strategic objectives.
Interconnectedness	Systems integration with internal technology and the value derived from the adoption of new technology, which can leverage off existing infrastructure. Preference is given to technologies that are not tightly coupled for easy integration.
Strategic objectives	Strategic objectives and position of the organisation in relation to its competitors. Organisations that pursue an aggressive, innovative market strategy are more likely to pursue adoption of new technologies more regularly.
ICT awareness	Innovations engender competitive advantage via practical benefits. However; lack of cognisance for the technology is likely to fuel concerns for adopting the technology.
Uncertainty of business benefits	Decision-makers decline to adopt technology that does not contribute towards benefits related to operational matters for improved productivity, efficiency and response time.

Source: Own compilation.

Research methodology

The researcher worked with observable reality where the product of the research could produce law-like generalisations and worked primarily from a positivism paradigm. The inquiry strategy was a case study. The data collection methods were through observations, informal discussions and questionnaire. The data used to develop the research instrument were based on input from theoretical information, observable facts and feedback gathered during the pilot study of the questionnaire. Table 6-4 integrates the overall research design components.

Table 6-4: This study's research design components

Component	Description
Research question	What are the critical ICT adoption drivers and inhibitors?
Context	Case study in a large organisation
Propositions*	P_1 ICT adoption drivers allow for the adoption of technology sooner. P_2 ICT adoption drivers enable organisational readiness towards better decision-making for ICT adoption. P_3 ICT adoption inhibitors delay the adoption of technology. P_4 Day-to-day activities influence strategising actions for ICT adoption.
Unit of investigation/analysis	Primary - factors influencing ICT adoption.

Component	Description
Unit of observation	ICT adoption factors.
Logic linking the data to the propositions	The perceptions of different levels of management on how they strategise can direct an understanding of ICT adoptions.
Criteria for interpreting the findings	Literature research identified key factors for ICT adoption, which was used to interpret the propositions by seeking support or no support.
* = Propositions are set to structure the research process in support of the research question. Research questions are converted to statements for which support (or not) is sought	

Source: Adapted from Yin (2003:21).

Paper contextualisation

The research objectives identified in this paper is part of a larger study concerning ICT adoption. This paper reports only on the ICT adoption factors and identifies the relevant critical ICT adoption drivers and inhibitors of the case organisation. These factors are measured for relevance against the adoption framework and are examined against the backdrop of s-as-p. The empirical findings of the ICT adoption factors provide insight into the case organisation's strategising approach for ICT adoption and provide relevance to the ICT adoption factors.

Research design

The inquiry strategy used in this study was a case study, which attempted to answer the research objectives and to explain a phenomenon in a real world context where the boundaries between the phenomena and context may not be clear. This choice is supported by Yin (2003:40) in that a single case study may be used where the case is representative or typical of an everyday commonplace situation and where the case may be revelatory. The study made use of a research instrument in the form of a questionnaire to answer the research objectives. The context of the study was to gain a better understanding of how strategising for ICT adoption happens in practice. The empirical study aims to gain an understanding of the effects of technology adoption on strategising from an s-as-p perspective.

Data collection

This study made use of a questionnaire to answer the research questions and relied on informal discussions as a means to gather additional information, which assisted in

formulating the questions used in the questionnaire. The informal discussions focused on factors relating to ICT adoption, current organisational management 'pain points' and strategising. The purpose of the informal discussions was to gain additional information from organisational experts on current managerial challenges. Both research and the information obtained from informal discussions formed the basis for questions used in the research instrument.

A self-administered online questionnaire mostly incorporating a five-point Likert scale and ranking questions was developed. The instrument was piloted amongst selected representative groups consisting of various levels of management from different decision-making streams. Feedback gathered from the pilot study was used as input to amend the questionnaire by improving the grammar, sentence construction and removal of ambiguity. The questionnaire was distributed via electronic mail using a secure and trusted website to targeted respondents from various levels of decision-making within the organisation. The questionnaire was designed so that the respondents were forced to answer all questions within a section before attempting the next section. This ensured that no questions were left unanswered in a section. The questionnaire prevented respondents from entering unnecessary or unrelated data, which guaranteed trusted, appropriate and reliable responses.

Sampling procedure

The population of this study was a large organisation (2 272 employees) representative of an organisation in the financial and banking industry. Participants who are directly involved in or contribute towards strategising for ICT adoption were part of the identified target population and served as the unit of analysis in this study. This included executive, middle, line and operational managers employed in the organisation in which the study was undertaken. Managers serve as the key decision-makers and are instrumental in decisions pertaining to ICT adoption. It is for this reason that they were selected as the primary participants for the study. In addition, selected levels of employees from the organisation who do not occupy management positions but occupy positions of functional responsibility and who are capable of potentially influencing decision-makers were also selected to be part of the target group. Ultimately, the sample population selected was stratified for job

levels. The representative sample size was 1 200 and the survey instrument ran for a period of three weeks.

Response rate

The questionnaire provided sufficient anonymity for the respondents to be open and honest in their responses. While the questionnaire provided a means for more accurate responses, not all respondents completed the questionnaire. As is the nature of questionnaires, respondents are subjected to participant bias. This is the limitation of the selected sampling approach. Of the 1 200 targeted respondents, only n=352 participants completed the questionnaire successfully. This indicates a response rate of 29%. Four hundred and thirty three (433) respondents attempted to complete the questionnaire. However, after reading the introduction that set the context of the questionnaire, thirty three (33) respondents did not pursue to complete the survey. This could have been as a result of self-determined inadequate knowledge of or exposure to the subject on the side of the respondent. Any number of reasons could be speculated as to why the other 56 respondents who attempted section 1 did not successfully complete the rest of the questionnaire. This could range from lack of time, inadequate knowledge on the subject, lack of exposure to or involvement of the respondent towards the subject matter, operational issues and the like.

Data analysis procedures

Although this study made use of a single organisation as a unit of analysis, 'data and theory triangulation' was used in analysing the data. Data gathered from informal discussions and questionnaire responses was used to extract as much richness as possible to corroborate some fact or phenomenon. Patterns were identified from the data. The online questionnaire safeguarded the reliability and accuracy of the data by preventing respondents from entering invalid or inaccurate data. This was made possible by presenting the respondents with a list of pre-defined responses for each question. This eliminated the need to clean the data, as unwarranted data was not captured. All incomplete responses were excluded from the final analysis.

Exploratory factor analysis (EFA) was undertaken and Cronbach alpha coefficients were calculated to assess the validity and reliability of the scales, so measuring the factors

under investigation. As high correlations within factors were expected, an oblique rotation was executed. Descriptive statistics were calculated to summarise the sample data and correlation coefficients in order to establish relationships between the factors under investigation. Finally, an analysis of variance (ANOVA) was used to test for significant differences between means for factors under investigation. Two assumptions must be satisfied before an ANOVA can be done (StatSoft, Inc., 2013). Firstly, the residuals must be distributed normally and, secondly, the variances must be equal. Initially the data did not comply with the assumptions. However, once a Normal Blom Transformation was performed, the data complied with the assumptions. Thus, both requirements were met. A Kruskal–Wallis test was performed on ranked raw data to allow for the comparison of more than two independent groups. Further investigation was necessary where significant differences were observed in the data. A PostHoc test was performed to do pair wise comparisons and the least square means t-test was used for this.

Empirical findings

Demographics

Table 6-5 shows the demographic spread of sample respondents in terms of gender, age, education, department and job function. An analysis of the demographic data indicates that 55% of respondents are male and 63% are respondents older than 40 years of age, which indicates a senior demographic sample. A total of 29% are in possession of a diploma or certificate, indicating a more specialised field of qualification, whereas 39% are in possession of a postgraduate degree, indicating a skilled user group. Of the respondents, 24% are from the technology business unit. This is the highest response rate compared to other departments and could mean that these respondents could identify with the survey because of their functional roles. The job function indicates a fair spread of respondents with a higher percentage from the operational levels.

Table 6-5: Demographic information of respondents

Factor		Frequency (%)
Gender	Female	159 (45.17%)
	Male	193 (54.83%)
Age	20–29 years	29 (8.24%)
	30–39 years	101 (28.69%)
	40–49 years	136 (38.64%)

	50–59 years	86 (24.43%)
Education	Matric or less	41 (11.65%)
	Diploma or Certification	104 (29.55%)
	Degree	70 (19.89%)
	Postgraduate degree	137 (38.92%)
Department	Bank Supervision	21 (5.97%)
	Business Systems and Technology	85 (24.15%)
	Corporate Services	16 (4.55%)
	Currency Management	53 (15.06%)
	Executive Management	5 (1.42%)
	Financial Markets	13 (3.69%)
	Financial Services	21 (5.97%)
	Financial Surveillance	15 (4.26%)
	Human Resources	17 (4.83%)
	Internal Audit	11 (3.13%)
	International Economic Relations and Policy Management	2 (0.57%)
	Legal Services	8 (2.27%)
	National Payment System	9 (2.56%)
	Research	40 (11.36%)
	Risk Management and Compliance	4 (1.14%)
	Training College	5 (1.42%)
	Security Management	22 (6.25%)
	Strategy and Communications	5 (1.42%)
Job Function	Strategic	41 (11.65%)
	Senior manager	62 (17.61%)
	Line function	87 (24.72%)
	Operational	162 (46.02%)

Construct validity of the measuring instrument

EFA was conducted and loadings greater than 0.25 were considered as useful for inclusion. Table 6-6 indicates the oblique rotated factor loadings and shows that all items loaded well on their constructs. A total of 26 of the original 30 items loaded successfully. The 4 items that did not load were eliminated from further statistical analysis. The 26 items were grouped into 5 factors and each factor was named accordingly, based on the variables within the factor. Together, the 5 factors explained 42% of the overall variance. An analysis of the items in each factor confirmed that the 5 constructs measured are in accordance with the intentions of the instrument. Ranked in order of eigenvalues (Table 6-6), they are as follows:

Factor 1: Decision drivers: Positive factors that provide the impetus to adopt technology.

Factor 2: Decision inhibitors: ICT barriers that delay or restrain ICT adoption.

Factor 3: Organisational readiness: Internal aspects that set the tone for ICT adoption.

Factor 4: Pace of innovation: Rate (innovative) and speed (timing of release) at which

technology is developed and introduced to the market.

Factor 5: Established technology: Implemented technologies that are diffused and stabilised within the organisation.

Table 6-6: Factor matrix: rotated factor loadings with factor items

Statements	Decision drivers	Decision inhibitors	Organisational readiness	Pace of innovation	Established technology
The availability of resources internally and externally supports the technology.	**0.8630**	-0.0380	0.0180	-0.1100	0.0350
Ease of use (in relation to business function and implementation) is associated with the technology.	**0.7740**	0.0950	-0.0500	-0.0030	0.0010
There is sufficient availability of knowledge or expertise about the technology.	**0.6750**	-0.0430	-0.0100	0.2390	0.0680
Technology characteristics are in favour of increased operational effectiveness.	**0.6750**	0.1340	0.0050	0.0440	-0.0760
Top management supports the adoption of new technology and has a positive attitude.	**0.5360**	0.0080	0.1420	0.1000	0.0120
There is poor perceived user satisfaction and user experience regarding usability of the new technology.	-0.0300	**0.8140**	0.0450	-0.0490	-0.1200
There is uncertainty regarding the business benefit associated with the technology.	0.0530	**0.7530**	0.0440	-0.1250	-0.0520
There is an adverse organisational culture towards the adoption of new technology.	-0.1180	**0.5940**	-0.0400	0.1550	0.0380
There is a complex internal decision-making process for the adoption of new technology.	0.0820	**0.5210**	-0.2080	-0.0190	0.1250
There is poor availability of multiple vendor support for the new technology.	0.2030	**0.4580**	0.0880	-0.0300	0.0620
There is a high initial demand for investment to implement the new technology	0.0610	**0.3380**	0.0310	0.1440	0.0660
The organisational policies easily provide for the adoption of new technologies.	-0.0400	-0.0220	**0.7550**	-0.0680	-0.0080
A good working relationship exists between business units and the ICT department.	-0.1260	-0.0210	**0.6090**	0.0830	-0.0380
It is easy to obtain budget approval for the adoption of new technology for strategic business projects.	0.1130	0.0090	**0.5320**	-0.1770	-0.0810
The organisational culture adopts a technology focus view when searching for solutions that address operational efficiency.	0.0980	0.0840	**0.4600**	0.1570	0.1430
The organisational culture adopts a technology focus view when searching for solutions that addresses the business strategic objectives.	0.1170	0.0020	**0.4420**	0.1770	0.0050
There is a reliance on strategic planning tools and processes to assist decision-makers with strategic business decisions.	0.1000	0.0230	**0.4050**	0.0530	0.1040
The business unit depends on the ICT department for guidance on what technology to adopt that would best meet its business objectives.	-0.0160	-0.0200	**0.3880**	0.0650	0.0980
The speed at which technology innovation is progressing influences business decisions when adopting new technology.	0.1630	0.0180	0.1210	**0.5950**	-0.0890
Given the rapid pace of innovation in technology with potential benefits to strategic objectives, management has no choice but to adopt new technology.	-0.0990	-0.0120	0.0760	**0.5890**	0.0260
It is important that I keep abreast of	0.0610	0.0210	-0.0170	**0.5150**	-0.1220

technological innovations.					
The demand on management's ability to execute day-to-day duties increases in complexity as a result of technology innovation.	-0.0130	-0.0090	-0.0260	**0.4950**	0.0710
There is a need to stay abreast of the latest technology.	0.1800	-0.0420	0.1150	**0.4730**	0.0220
My personal experience and exposure towards technology influence my business decisions when recommending the adoption of new technology.	0.0340	0.1150	-0.0300	**0.2820**	0.0700
When adopting new technology its compatibility with existing infrastructure outweighs the importance of its potential strategic business benefit.	0.0000	-0.0040	0.0480	-0.0820	**0.8760**
When adopting new technology its stability with existing technology outweighs potential strategic benefits.	0.0030	-0.0030	0.0200	-0.0150	**0.7570**
Number of items in factor	5	6	7	6	2
Eigenvalue	5.6362	2.9416	1.8778	1.7123	1.3596
% Variance explained by the factor	19.33	7.61	6.88	4.60	3.64
% Cumulative variance explained by the factor	19.33	26.94	33.82	38.42	42.06
Cronbach Alpha	0.8566	0.7747	0.7396	0.6893	0.7948
Mean	4.1557	3.8367	3.3462	4.0663	3.3580
Standard Deviation	0.7780	0.6912	0.6895	0.5997	0.9427

The research instrument was confirmed as reliable and valid for further analysis. The standard deviation and variance indicate a close relationship within the entire data set. An inspection of the correlations between the factors was done to ensure that they were indeed independent.

The correlations between the 5 constructs are shown in Table 6-7 and indicate the scale inter-correlations for the rotated factors. The correlation coefficients for *decision drivers, pace of innovation*, and *established technology* were close and indicate that the factor items positively influence one another when deciding to adopt ICT. The correlation coefficient of *decision inhibitors* to *organisational readiness* is suggestive that *decision inhibitors* create a barrier, which delays the adoption of technology within the organisation.

Table 6-7: Scale inter-correlations for the rotated factors (p-value = brackets)

Item	Decision drivers	Decision inhibitors	Organisational readiness	Pace of innovation	Established technology
Decision drivers	1.000				
Decision inhibitors	0.41072 (<.0001)	1.000			
Organisational readiness	0.37029 (<.0001)	0.02904 (0.5871)	1.000		
Pace of innovation	0.39104 (<.0001)	0.21808 (<.0001)	0.33578 (<.0001)	1.000	
Established technology	0.12970	0.15085	0.17450	0.15068	1.000

	(0.0149)	(0.0046)	(0.0010)	(0.0046)	

Influence of independent demographic variables on factors

An ANOVA was done with the scores of the factors as dependent variables to determine if these factors were influenced by various demographic factors. Four independent variables were measured against the scores of five dependent factors. The independent demographic variables were *decision-making by management only, decision-making by individuals, level of education,* and *job function.*

Table 6-8: Analysis of variance for decision drivers

Source	DF	F Value	Pr > F
Decision-making by management only	3	0.37	0.7717
Decision-making by individuals	3	3.54	0.0149*
Level of education	3	3.32	0.0200*
Job function	3	0.06	0.9817
* Significant on 5% level			
Analysis of independent variables			
Decision-making by individuals	**N**	**Mean***	**Std-Dev**
Strongly disagree/Partially disagree	61	3.8590[a]	0.9962
Neutral	65	4.1169[ab]	0.6499
Partially agree	139	4.2532[bc]	0.7185
Strongly agree	87	4.2368[c]	0.7412
Level of education			
Matric or less	41	4.3415[b]	0.6152
Diploma or certification	104	4.1692[ab]	0.7822
Degree	70	4.2600[b]	0.7137
Postgraduate degree	137	4.0365[a]	0.8357
* Means with different superscripts differ significantly on a 5% level			

Table 6-8 indicates that *decision drivers* vary depending on how respondents perceive their level of individual decision-making and their level of education. A significant group of respondents measured a high score on *decision-making by individuals* for *decision drivers.* This may be indicative of the individuals' perceptions, whereby individuals believe they are able to make a difference in decision-making for ICT adoption. Respondents with postgraduate education measured low on *level of education* for *decision drivers.* An analysis of data on *level of education* indicated a significant difference between respondents from the ICT department ($p=0.02$) compared to all other departments in the organisation. Respondents from the ICT department measured higher on the under-graduate qualifications while respondents from all other departments measured higher on postgraduate qualifications. One can speculate that ICT is a specialised field and, as such,

requires specialised certification and may be the motivation why respondents with a postgraduate qualification measured low for *decision derivers.*

The ANOVA identified no influence on the factors *decision inhibitors* and *pace of innovation* by *decision-making by management only* and *job function*. Therefore, these were not explored further and no data is reported on this factor.

Table 6-9: Analysis of variance for organisational readiness

Source	DF	F Value	Pr > F
Decision-making by management only	3	0.320	0.8117
Decision-making by individuals	3	9.150	<.0001**
Level of education	3	6.010	0.0005**
Job function	3	0.950	0.4167
** Significant on 1% level			
Analysis of independent variables			
Decision-making by individuals	**N**	**Mean***	**Std-Dev**
Strongly disagree/Partially disagree	61	3.0304^a	0.6926
Neutral	65	3.2505^a	0.5836
Partially agree	139	3.4789^b	0.6689
Strongly agree	87	3.4269^b	0.7220
Level of education			
Matric or less	41	3.5017^a	0.7215
Diploma or certification	104	3.5275^a	0.6298
Degree	70	3.3265^a	0.6240
Postgraduate degree	137	3.1721^b	0.7160
** Means with different superscripts differ significantly on a 1% level			

Table 6-9 indicates that *organisational readiness is affected by decision-making by individuals* and *level of education*. Individually, respondents perceived that they were able to contribute towards *organisational readiness* more than through collaborations. One can speculate that this influence stems from their day-to-day operations. Respondents with *postgraduate degrees* measured low on *organisational readiness.* One can speculate that ICT is influenced by a specialised skills set more than generic qualifications.

Table 6-10: Analysis of variance for established technology

Source	DF	F Value	Pr > F
Decision-making by management only	3	3.290	0.0200*
Decision-making by individuals	3	1.160	0.3250
Level of education	3	3.370	0.0188*
Job function	3	0.500	0.6797
* Significant on 5% level			
Analysis of independent variables			

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Decision-making by management only	N	*Mean	Std-Dev
Strongly disagree/Partially disagree	87	3.0690[a]	1.0761
Neutral	88	3.4034[b]	0.8018
Partially agree	104	3.5385[b]	0.8553
Strongly agree	73	3.3904[b]	0.9869
Level of education			
Matric or less	41	3.2561[ab]	0.8953
Diploma or certification	104	3.6106[b]	0.8729
Degree	70	3.2786[ab]	0.9542
Postgraduate degree	137	3.2372[a]	0.9741
* Means with different superscripts differ significantly on a 5% level			

Table 6-10 indicates that *decision-making by management only* and *level of education* influence *established technology*. Those in agreement with *decision-making by management only* indicated that they were able to influence *established technology* more. One can speculate that due to financial influence on the organisation, respondents perceived that executives have dominance over decision-making where this factor is concerned.

Discussion of findings

The primary objective of this paper was to identify how ICT adoption drivers and inhibitors influence strategising for ICT adoption within the case organisation. In doing so, the paper firstly identified the ICT adoption factors using the statistical method of factor analysis, Five ICT adoption factors were extracted by means of EFA and, as confirmed in literature, were identified as theoretical influences of ICT adoption. These were *decision drivers, decision inhibitors, organisational readiness, pace of innovation* and *established technology.* In this section of the paper, the empirical findings are examined against the ICT adoption framework in more detail, to determine the relevance of the factors and to expose the critical ICT adoption drivers and inhibitors that are specific to the case organisation. The ICT adoption factors are also analysed to improve the understanding of ICT adoption in the context of the case organisation. Additionally, the items within the identified categories of adoption factors are examined from the practice perspective to garner insight into the activities of ICT adoption.

Relevance of case factors against adoption framework

The constructs provide for strong relevance to the adoption framework as all items with the constructs can be easily classified into one of the three adoption factors. The constructs as identified by the case organisation indicate that the items represent one or more of the adoption factors, which indicate that the constructs may influence one or more disciplines of the organisation. The construct of decision drivers and decision inhibitors indicate that the critical views of management form the impetus for decision-making. Analysis of the factor items indicate that 16 of the 26 items can be successfully characterised from the 'organisational' factor, 9 from the 'innovation' factor and 1 from the' external' factor.

One can speculate that the case organisation's strategic objectives are driven largely by internal organisational and structural objectives and that the case organisation is not heavily affected by external regulatory influences. This may be a result of the type of the case organisation. In addition, although the organisation does not pursue technology aggressively it does factor the influence of technology innovation into organisational decision-making. The degree to which technology innovation drives decision-makers to adopt the technology sooner warrants further investigation.

Analysis of factors

The centrality of ICT systems for executing business functions is indisputable as shown by the high agreement response (93.18%) to the statement '*ICT systems are essential in accomplishing business functions*'. This supports a strong organisational need for ICT to conduct business operations within the organisation. Within this strong need for ICT, preference is for selecting technologies that cater for the organisation's strategic need (89.49% supported). Decision-makers therefore consider potential strategic and business value, which the technology may provide, prior to its adoption.

The factor that explained most of the variance in ICT adoption is *decision drivers* (19.33%), which indicate that a strong market acceptance for the technology must exist prior to its adoption in the organisation. Its strong correlations with *organisational readiness, pace of innovation* and *established technology* suggests that the higher an organisation's need is to pursue ICT adoption, the stronger its readiness is in accepting the technology. The analysis of the data indicates a strong positive correlation between

decision drivers and *decision inhibitors,* which is suggestive that in certain circumstances, regardless of the need for ICT adoption, the organisation may not be supportive of its adoption. This finding may be unique and specific to this case organisation and may be attributed to the organisation's culture or nature of its business, uncertainty regarding business benefits, or complexity associated with the technology. Other contributing factors towards this correlation may be that the organisation is highly risk averse, is not favourable towards 'bleeding edge' technology and therefore may prefer a 'wait-and-see' approach towards acceptance of the technology.

Decision drivers are viewed as more relevant when respondents perceive that individuals make the decisions compared to when they think there is collaborative decision-making. The respondents with higher levels of education considered *decision drivers* as less important, suggesting that the availability of resources, knowledge and expertise; ease of use; top management support; and operational effectiveness are less crucial for ICT adoption compared to the views of lower qualified respondents. One can speculate that respondents with lower level education may occupy operational positions within the organisation and may appreciate first-hand the need for top management support in the adoption of crucial technology. This may be revealing of disparate thinking between senior and junior levels of management.

Decision inhibitors, with elements such as poor user satisfaction, uncertainty of business benefits, adverse organisational culture, and poor availability of vendor support (explaining 7.61% of the variance), encourage decision-makers to avoid the adoption of ICT when they do not demonstrate visible relative advantage, business benefits and strong market presence. The strong correlation between *decision inhibitors* and *organisational readiness* suggests that an organisation's policies and structures are unfavourable towards the adoption of technology when the adoptive technology is not supportive of operational efficiencies or aid in achieving strategic business objectives. This is a common trend amongst organisations that pursue business value through the adoption of technology (Cohen *et al.*, 2002; Piva *et al.,* 2003; Gera & Gu, 2004). All respondents shared similar views concerning *decision inhibitors*, which indicate that this is a collective view that is supported by the organisational culture. The correlation between *decision inhibitors* and *pace of innovation* suggests that although management is aware of the advancement in

technology, managers' individual exposure towards technology influences their decisions regarding its adoption. Management is cognisant of disruptive technologies and its influence on *established technology.* However; preference is given to stability and compatibility with internal infrastructure.

Organisational readiness explains 6.88% of the variance. Elements of *organisational readiness* include characteristics such as culture, knowledge and expertise, and end-user behaviour, amongst others. Data on culture, which is an item of *organisational readiness,* indicates that respondents perceive that benefits in operational efficiencies take priority over strategic objectives. Studies indicate that culture is a key determinant in influencing an organisation's decisions to adopt ICT (Fink, 1998; Russell & Hoag, 2004; Hollenstein, 2004). Negative decision-making factors negatively influence *organisational readiness* in its ability to adopt ICT. Respondents perceived that individual decision-making significantly influences *organisational readiness* more than group decisions. The respondents with higher levels of education considered *organisational readiness* for ICT adoption as less important than the views of lower qualified respondents. One can speculate that from a strategic management point of view, this may not be an issue because irrespective of the user attitude towards technology, executive decisions may be taken to adopt the technology. This may be applicable to ICT adoption, which is of strategic importance to the organisation.

Although items in *pace of innovation* (explaining 4.60% of the variance) influence the demands on management, the data indicates that this factor did not greatly influence the organisation's decisions to adopt ICT. The rapid pace of technological innovation usually means major changes over the previous technology (Agarwal & Prasad, 1998:16), which may be the reason management is not keen to introduce new technologies into the organisation. Given that the organisation under study adopts a risk averse view towards technology adoption, all respondents shared this view.

Established technology explains 3.64% of the variance. The respondents with postgraduate levels of education did not rate *established technology* as high as respondents with under-graduate levels of education did. Respondents from the ICT department (24.15%) indicated a significant difference (p=0.02) in their level of education

compared to the rest of respondents. This may be a result of the nature of their job function, which may account for the specialisation of skills. This may influence management on operational levels more than on senior levels. Respondents (75.28%) were of the opinion that executive management was able to influence ICT adoption decisions, which affected *established technologies* more than individuals could. The strategic nature of these decisions may introduce radical change to the organisation and may require large investments, which is why executive involvement may be required. This could be a result of obsolete technology, poor vendor support or changes in strategic technical directions.

Factor analysis through the practice lens

From the responses, it is evident that technology is essential to the organisation, therefore one can safely presume that day-to day activities are to a large extent executed through the use of technology. The items within the constructs indicate that the case organisation views technology adoption for operational effectiveness and strategic objectives as important, with a stronger focus on technology efficiency. One can speculate that the activities within the organisation are skewed towards operational efficiency. Therefore, decision-making for ICT adoption has a primary focus on strategic adoption activities that address business efficiencies over those that serve as a driver for competitive advantage. This is also supported by the fact that factor items are mostly characterised by internal organisational aspects.

Factor items in 'organisational' category provide insight into the activities of strategising. Organisational practices of obtaining budget approvals, setting of policies, reliance on technology tools, guidance from the ICT unit and cultural paradigm provides strong impetus for technology adoption. The construct of 'decision inhibitors' are shaped by user perceptions of technology. One can speculate that these behavioural patterns are associated with past exposure to technology as such, users adopt a cautious wait-and see approach to technology adoption. The factor items associated with 'pace of innovation' indicate that management activities are increasing in complexity by the rate of new innovation. Exactly how this influence the activities are not clear and warrants further investigation. It is evident that the factor items associated with 'established technology' provides a strong indicator into the views of managers when considering adoption of

technology. Decision activities associated with adoption of technology are primarily focused on technologies that compliment internal stability and compatibility of operations. One can speculate that this is largely influenced by the type of the case organisation, as it does not make use of technology adoption as a means to pursue competitive advantage.

Insight into the items of adoption factors indicate that strategising activities for ICT adoption within the case organisation are to a large extent governed by internal structural and operational aspects. This is supported by the respondents perception of 'top management involvement', 'availability of internal resources and knowledge' and aspects associated with 'business benefit'. Thus, one can speculate that activities of ICT adoption have a primary focus on internal business benefits. Given the context one can further conjecture that ICT adoption serves as a supportive role to business operations and not instrumental in achieving competitive advantage.

Overall, the analysis of five factors, and items within each factor, provides strong evidence of statistically significant predictors of ICT adoption. It also provides support for the following propositions: P_2, which states that ICT adoption drivers enable organisational readiness towards better decision-making for ICT adoption; P_3, which states that ICT adoption inhibitors delay the adoption of technology; and P_4, which states that day-to-day activities influence strategising actions for ICT adoption. The study, however, did not provide sufficient support for P_1, which states that ICT adoption drivers allows for the adoption of technology sooner.

Management and ICT adoption implications

The findings presented in this study provide executives with an understanding of ICT adoption factors. The outcomes presented in this case organisation indicate that there is a shift in the manner for which effective ICT adoption strategies are formulated. This study provides insight into the understanding of the factors that influence management's thinking for ICT adoption at an individual level, and confirms that strategy-making is no longer confined to strategic managers of the organisation but may involve the contribution from various lower levels.

The empirical findings indicate that there is relevance for all factors when strategising for ICT adoption within the case organisation. In addition, it is evident that decision drivers and inhibitors may be a combination of organisational, innovative and external factors. The key practical implication is that decision drivers enable organisational readiness, which is an indicator in determining the organisation's preparedness to adopt ICT. Managers must be supportive and should champion an organisational culture that encourages decentralised decision-making as this can contribute towards developing agile strategies for ICT adoption. Executive management needs to solicit the involvement from lower operational managers as it is evident from the findings that lower level managers perceive that they are able to contribute valuably towards decision-making for ICT adoption. The collective view of all respondents on decision inhibitors are suggestive that users set the tone for organisational culture, which is why it becomes imperative that their requirements should be considered for strategic decisions. Empirical findings indicate that job function influences ICT adoption factors. Finally, an analysis of the data is indicative that higher levels of education did not significantly influence ICT adoption factors, as managers with lower level qualifications are able to influence ICT adoption factors far more than managers with higher qualifications are able to.

Conclusions

The empirical results of this study provide a strong overall validation and confirmation of the importance of ICT adoption factors and their influence on strategising for ICT adoption amongst various management levels. This study not only confirmed the importance of ICT adoption factors as supported by previous studies (Lee, 2004; Russell & Hoag, 2004; Latham, 2011), but also added the role and influence of job function and level of education as contributors towards ICT adoption factors. In unpacking the micro-activities of various management levels, practical insight was provided into their praxis and practices. This insight led to an improved understanding into their workings and ability to strategise for ICT adoption. Hence, the study achieved its intended goal of understanding the ICT adoption drivers and inhibitors as viewed by management within the case organisation.

Limitation and suggestions for future research

The shortcomings of the study are as follows: firstly, this study focused on a single case organisation. Although, it is possible to generalise the findings for contextually similar organisations, the extent to which this is possible need to be explored further. Additionally, further research is required to determine if support for these findings is repeatable in other organisations. Secondly, the study was subjected to participant bias, as is the nature with questionnaires (Saunders *et al.,* 2009:110). Although attempts were made in the questionnaire to eliminate bias were possible by providing a list of responses to select from and validating the responses where possible, it was still inevitable. Thirdly, although the study indicated that ICT drivers were able to contribute towards ICT adoption decisions, it was inclusive in determining whether the ICT drivers supported the adoption of technology sooner and therefore further investigation needs to be done in this area. Finally, there is a high correlation amongst the five factors and the results of the findings should be evaluated in light of this.

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7 PAPER 3: THE RELATIONSHIP BETWEEN DECISION-MAKING AND ICT ADOPTION: THE PRACTICE TURN
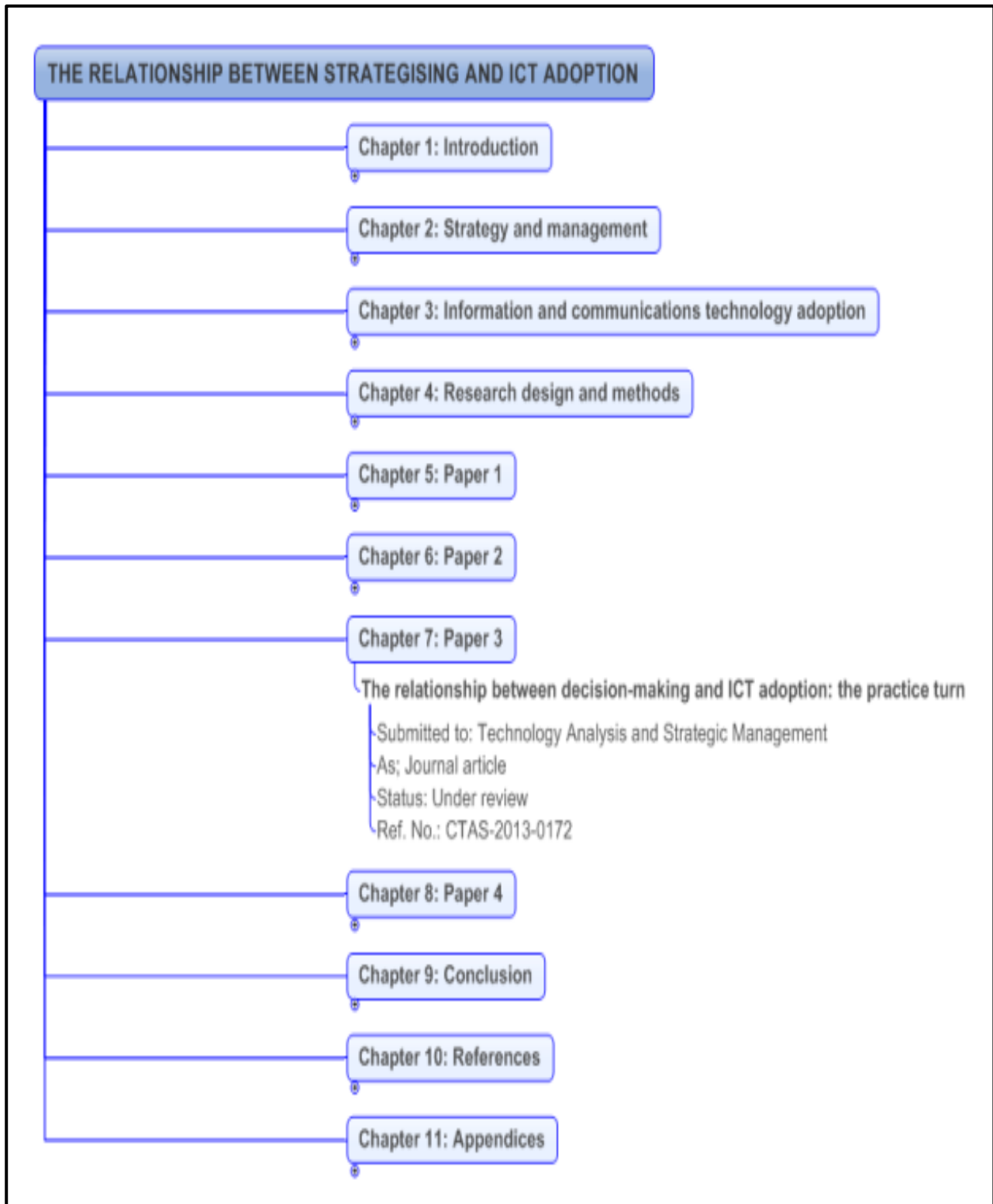
INFORMATION ABOUT PAPER 3

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The relationship between decision-making and ICT adoption:
the practice turn

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Abstract

Purpose: Over the past decade, information and communications technology (ICT) has gained prominence as a key contributor that is revolutionising the ICT landscape. This has happened through the rapid pace of innovative ICT products and the manner in which organisations conduct business, and in response to innovations influencing the market environment. As an ostensible choice, managers are relying on ICT adoption as a means to improve strategic, tactical and operational processes. The challenge facing managers is what technology to adopt and how to ensure that the appropriate technology is adopted. This paper reports on an individual case study that concentrates on the micro-activities relating to decision-making of ICT adoption through the strategy-as-practice lens. The key purpose of this paper is to understand the influence of ICT innovation on decision-making activities that culminate in the adoption of the selected technology, and the influence this has on the various management decision-making roles. In addition, this paper aims to enrich the strategy-as-practice body of knowledge with practical insight.

Design/methodology/approach: The research made use of a single case study. The method of data collection was an electronic questionnaire, which was supported by observations and informal discussions.

Findings: The findings provide insight into the decision-making activities for ICT adoption and indicate that there is a shift in the strategy formulation style where decision-making is concerned.

Research limitations/implications: The focus of this study is on the ICT adoption practices within a single case organisation.

Research limitations/implications: There is a shift in the management approaches to decision-making, which may imply an evolution in organisational structures.

Originality/value: This paper produces insight into strategising for ICT adoption in an attempt to determine the influence that the pace of technology has on organisational decision-making activities, in their endeavour to stay abreast of their market environment.

Keywords: Strategy, Strategy-as-practice, ICT adoption, ICT innovation, Management, Decision-making

Introduction

Amid increased globalisation, technological innovation and changing social trends, the current environmental context within which organisations interact is facing increasing instability (Eisenhardt *et al.*, 2010:1263). The accelerated pace of advancement in technological innovation is the largest contributor towards this instability and is constantly revolutionising the manner in which organisations operate (Barba-Sanchez *et al.*, 2007:105). Given this context, traditional methods of doing business have become unacceptable and organisations need to re-evaluate their formulation of strategies to take advantage of environmental opportunities without attracting excessive risks. Contemporary strategies need to be aligned with the fluid nature of the organisation's external environment to better prepare the organisation for long-term survival. As an ostensible choice, managers are relying on information and communications technology (ICT) adoption as a means to improve strategic, tactical and operational processes. Additionally, technology adoption potentially engenders management in closing strategic gaps that may exist between the organisation and its environment.

In response to dynamic market forces, managers cannot afford to delay decision-making by having complicated traditional decision structures. Customers and clients alike expect fast turnaround times for service delivery. Hierarchical structures by their very nature imply longer turnaround times for decision-making. This implies that the traditional model of hierarchal structures, which thrived on stable market forces, is becoming ineffective in the contemporary environment. Thus, organisations need to flatten their decision-making structures to cater for agility, flexibility and speedy service delivery to clients (Ferioli & Migliarese, 1996:199; Landry *et al.*, 2006:137). In the contemporary context of strategising, top managers rely greatly on middle and operational managers' advice for the future strategic direction of the organisation. Strategy-making, which was once an undertaking by executive management only, has now evolved to include strategic contributors' throughout the organisation.

Strategy-as-practice has egressed as a unique approach for learning strategic management, managerial decision-making, organisational practices and management actions (Whittington, 1996:732; Jarzabkowski *et al.*, 2007:8). This approach has given rise

to a new school of thought that focuses on strategy as an 'activity' rather than a 'process' (Whittington *et al.*, 2006:618; Jarratt & Stiles, 2010:28). The critical thinking that this paradigm brings to strategy-making is that unlike the traditional approach which focused on the macro-aspects of strategy, this approach deals with the social practices of strategy (Vaara & Whittington, 2012:2). It is through this lens that the current study examines how strategising for ICT adoption happens in practice with particular reference to decision-making activities. The aim of this paper is to probe the micro-activities of practitioners, their praxis and practices to gain a better understanding of the decision-making styles and processes that culminates into the adoption of ICT. Ultimately, this study aims to supplement the strategy-as-practice (s-as-p) body of knowledge on the practical understanding of management's response to ICT adoption in the contemporary context.

The next section of this paper presents the research objectives. This is followed by the literature study and research methodology adopted in this paper. The empirical findings of the selected case organisation are presented thereafter. The paper then examines these findings in the context of ICT adoption by drawing on the s-as-p lens for insight into the decision-making activities and concludes with opportunities for future research.

Research question and objectives

In this study, s-as-p provides the framework for which the micro-activities of strategising are explored in detail, and contributes towards understanding how these activities respond to ICT adoption. In keeping with the focus area for this paper as identified in Table 1-1, this paper attempts to answer the following study's overall research question:

What are the practical implications of decision-making for ICT adoption?

In order to answer this question successfully this paper's research objective is to:

- identify the practical implications of decision-making for ICT adoption; and
- understand how strategising for ICT adoption happens in practice.

In achieving this objective, the paper aims to explore the following propositions:

- P$_1$ ICT adoption decisions are related to organisational factors.
- P$_2$ Decision-making for ICT adoption is related to level of education.
- P$_3$ Decision-making for ICT adoption occurs at various levels within the organisation.

Literature study

Background

The evolution of ICT has permeated organisations' daily operations and continues to influence the way business is done globally. Over the past decade innovations in technology has transformed the manner in which organisations operate. According to Dutta and Bilbao-Osorio (2012), the global economy is not only experiencing turbulence but has also become increasingly hyperconnected. In view of this, the traditional models used by organisations to develop strategies, which was dominated by stable environments are ineffective to address organisational challenges in the modern business context. The strategy approach required is one that can deal with the instability experienced in the current environment, while being agile and flexible to respond to the business need. S-as-p is ideally suited to address this challenge as it provides an alternative approach to mainstream strategy that focuses on the macro aspects of strategy. S-as-p provides a unique context in understanding the micro-level 'social activities', 'processes' and 'practices' that characterise organisational strategy and strategising (Golsorkhi *et al.*, 2010:1), as it provides a comprehensive, in-depth analysis of unpacking the decision-making activities of strategising. Decision-making for ICT adoption is not always straight-forward as there are external influences to consider. Thus, the advantage of using this approach to understanding strategising for ICT adoption, which is the context for this paper, is that it provides an opportunity to analyse how micro-level activities contribute towards the wider organisational practices.

The practice turn

Strategy-as-practice (s-as-p) focuses on strategic management, managerial activities and decision-making, all of which are key variables that contribute towards the realisation of ICT adoption. S-as-p, according to Jarzabkowski *et al.* (2007:8), refers to strategising as the 'doing of strategy' and explicitly focuses on human activities within the organisational context. Traditionally, strategy was seen as something that organisations 'had'. However,

strategy viewed from a practice perspective is viewed as something that people 'do' (Jarzabkowski, 2004:529; Chia & MacKay, 2007:223). S-as-p focuses on three key building blocks, which are the practitioners, practices and praxis. Strategising from an s-as-p perspective encompasses the nexus between these three building blocks. According to Whittington (2002:c1), the practitioners are the 'workers', the practices are the 'tools' and the praxis is the 'work' of strategy. Practices are seen as the 'infrastructure through which micro-strategy and strategising occurs' (Jarzabkowski, 2003:24). Strategy practitioners are the 'actors', those individuals who do the work of strategy; the strategy practices are the 'material tools' through which the work gets done; and the strategy praxis are the 'actions' that meet the objective of the strategy (Jarzabkowski & Spee, 2009:70).

S-as-p is mostly concerned with the daily practices of individuals and explores how these actions influence strategy (Jarzabkowski & Wilson, 2002:358). Amongst others, the managerial activities of strategising include analysis of data, workshops, meetings, making presentations, strategy committees, and preparing formal documents – activities that must not be taken lightly (Whittington, 2003:117; Hodgkinson *et al.*, 2006:479). By leveraging from the s-as-p lens, aggregate actors can be examined to determine how they construct localised micro-levels of strategy praxis through actions like decision-making. Through the collaboration of the group's knowledge, experience and past practices in similar context, decision-making activities can shape the outcome of ICT adoption. S-as-p embraces all the conversations, routines and interactions that contribute to galvanizing and transforming the organisation's direction on a daily basis (Denis *et al.*, 2007:197). There are also inspirational aspects to strategising, for example, creative processes, identifying new opportunities and understanding the circumstances of activities (Whittington, 1996:732). According to Jarzabkowski *et al.* (2007:12), traditionally strategising was seen as something that only top management performed within organisations. However, s-as-p studies indicate that in the contemporary environment, both middle and lower level employees also contribute towards strategising. Strategising indicates the capacity of decision-makers to influence organisational actions by influencing strategic decisions. The practice theory posits that individual behaviour is embedded within social practices and praxis relies on practices (Vaara & Whittington, 2012:4). Thus by uncovering the

aggregate practitioner's view of ICT adoption factors one can expose the influence these factors have on practitioner's praxis.

Organisation's structural influence on decision-making

Managers are those individuals who undertake to do the work of strategy and are seen as 'craftspeople' in the process of strategy (Whittington *et al.*, 2006:616). Managers' decisions and activities contribute greatly towards achieving alignment between an organisation's strategies and the environment within which it operates (Goll *et al.*, 2007:162). Traditionally organisations had clear boundaries, formal procedures and well-defined authority structures. Thus, it was a commonly supported view that structure always followed strategy and that systems supported these structures. However, according to Bartlett and Ghoshal (1994:79), managers of modern organisations are shifting their focus towards that of 'purpose, process and people' in order to cater for the dynamic nature of current environments. The traditional model of strategy formulation is entrenched by a hierarchical structure that is supported by predictable and stable environments, whereas contemporary environments are dynamic with organisational structures that are supportive of middle and lower level involvement (Mantere & Vaara, 2008:342). When compared to the traditional model, distinct management roles are blurred because of the impact of ICT on management decision-making abilities (Drucker, 1988:3; Spanos *et al.*, 2002:662; Kearns & Sabherwal, 2006:136). Understanding how organisations react to change requires insight at an individual level (Christensen & Overdorf, 2000:1; Stensaker & Falkenberg 2007:143). Decentralised strategy-making allows critical strategic influences to originate from managers at lower levels (Andersen, 2004:1274).

Managers are involved in a wide range of decision-making activities that are of strategic importance to the organisation (Hendry, 2000:958; Chapman, 2001:63). Strategic issues become evident from the context within which managers engage daily and can contribute towards the strategic objectives of the organisation (Elter, 2004:6). Of all the challenges experienced by managers, managing ICT adoption is the most complex, as ICT adoption and decisions for the implementation thereof form the basis of improved efficiencies and attaining strategic objectives (Zahra & Covin, 1993:451). In the contemporary context of performing management praxis, managers need to adopt a new paradigm. Table 7-1 highlights the evolving nature of management. It is critical to management praxis that they

have an understanding of the factors that can influence the adoption of new technology (Sultan & Chan, 2000:106). Technology adoption serves as a vehicle that allows management to participate in a world of constant innovation with strategic benefits. However, the quandary facing management is in recognising how the ICT adoption factors shape decision-making.

Table 7-1: Evolving management paradigm

Traditional	Modern
Organisational discipline	Organisational learning
Rigid organisation	Flexible organisation
Low trust	High trust
Command and control	Empowerment
Hierarchies	Markets and networks
Strategy as prescriptive plans	Strategy as process, building consensus and unity
Not-invented-here syndrome	Receptivity to external inputs
Technology driven by strategic business units	Technology driven by core competencies
Functional structures	Business process structures
Knowledge is periodically useful and resides in a few staff	Knowledge is a key source of competencies and its creation and diffusion is encouraged throughout the organisation

Source: Dodgson *et al.*, 2008.

ICT adoption influence on decision-making

Decision-making for ICT adoption is subject to drivers that positively influence its adoption or barriers that delay or prevent its adoption. Drivers can be viewed as a resource, process or condition that is essential for the sustained success and development of the organisation. Critical drivers are the key motives or the main force behind the need for decision-makers to adopt technology. These positive factors provide decision-makers with the impetus to adopt technology. As much as the adoption of technology promises to bring value with strategic benefits to an organisation, past failures tend to make decision-makers risk averse to the adoption of the very technology that promises strategic advantages. Corrocher and Fontana (2008:231) state that organisations may view barriers to technology differently depending on individual characteristics, organisational function and market features, which may strongly influence adopters' behaviour. Decision-making for

ICT adoption is influenced by three critical factors, namely organisational, innovation and external.

Figure 7-1 encapsulates the above literature study into a framework, depicting strategising from a practice view and how this, together with ICT adoption factors, influences strategy-making. From an s-as-p view, decision-making is an activity of an organisation's practices. The style and approach to decision-making in the context of ICT adoption are shaped by internal and external factors.

Figure 7-1: Framework for factors influencing decision-making for ICT adoption
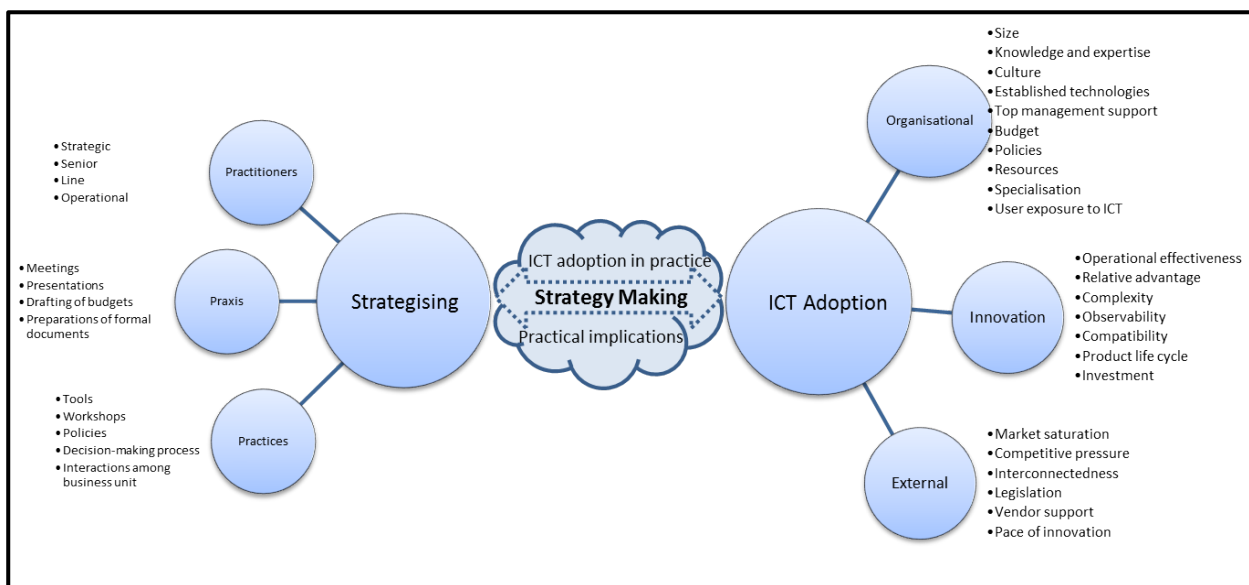
Organisational factors refer to internal aspects that set the tone for ICT adoption. The adoption of new technology is a practice in which decision-makers are influenced by the organisation's capabilities and its user network (Sieber & Valor, 2008:10). Tarafdar and Vaidya (2006:428) assert that the degree to which an organisation is responsive to new technology influences its tendency to adopt new technology. Preference is mostly given to internally established technologies to leverage off existing investments, unless the organisation intends to capitalise on emerging technologies by pursuing perceived advantage (Khanagha *et al.*, 2013:53). Studies indicate that organisational culture is a key determinant in influencing an organisation's decisions to adopt ICT (Fink, 1998; Russell & Hoag, 2004; Hollenstein, 2004).

Garcia and Calantone (2002:112) define innovation as 'an iterative process initiated by the perception of a new market and or new service opportunity for a technology-based invention which leads to development, production and marketing tasks striving for the commercial success of the invention'. Innovation factors are product-related characteristics that sway decision-makers to favour or delay the technology adoption.

External factors refer to industry pressures that sway decision-makers to support or delay the adoption of technology depending on the product maturity. Tidd *et al.* (in Troshani and Doolin, 2005:4) assert that a critical factor for the successful adoption of technology includes the ability of the organisation to predict and respond to changes in the industry. As a means of continued existence, external competitive pressures have made it compulsory for organisations to adopt ICT (Ghobakhloo *et al.*, 2012).

Research methodology

This section of the paper describes the research approach adopted in this study. It elaborates on the inquiry strategy, design of the questionnaire, method of data extraction, and data analysis techniques used in this study. A quantitative method was chosen in this study because the researcher wanted to answer questions about the complex nature of the phenomena, focusing on describing and understanding the phenomena from the point of view of the participants. The focus of the study was to find out not only what happens during technology adoption but also how it happens and more importantly, why it happens the way it does. Table 7-2 integrates the overall research design components.

Table 7-2: This study's research design components

Component	Description
Research question	How strategising for ICT adoption happens in practice and to understand the relationship of innovation on decision-making activities that culminates in the adoption of ICT.
Context	Case study in a large organisation
Propositions*	P_1 ICT adoption decisions are related to organisational factors. P_2 decision-making for ICT adoption is related to level of education. P_3 Decision-making for ICT adoption occurs at various levels within the organisation.
Unit of investigation	Primary – decision-making for ICT adoption.

Component	Description
Unit of analysis	ICT adoption factors.
Logic linking the data to the propositions	Repeated mentioning in the literature of relevant factors of ICT adoption can direct the focus for strategising and an understanding of how decision-making affects ICT adoption.
Criteria for interpreting the findings	Repetitive mention of ICT adoption factors by different levels of managers was used to interpret the propositions by seeking support or no support.
* = Propositions are set to structure the research process in support of the research question. Research questions are converted to statements for which support (or not) is sought	

Paper contextualisation

The research objectives identified in this paper is part of a larger study concerning ICT adoption. This paper focuses and reports on the different managerial level decision-making approaches that influence ICT adoption, the ICT adoption factors that affect decision-making and actives involved in decision-making within the case organisation.

Research design

The study makes use of a cross-sectional inquiry strategy in the form of a case study, which attempted to answer the research question and to explain a phenomenon in a real world context where the boundaries between the phenomena and context may not be clear. This choice is supported by Yin (2003:40) in that a single case study may be used where the case is representative or typical of an everyday commonplace situation and where the case may be revelatory. The study made use of a research instrument in the form of a questionnaire to answer the research objectives. The information used to develop the research instrument were based on input from theoretical information, observable facts and actual feedback gathered from the pilot study. The purpose of the study was to gain a better understanding of the decision-making activities involved in strategising for ICT adoption.

Data collection

Both the research and the information obtained from informal discussions formed the basis of the questions used in the research instrument. A self-administered online questionnaire mostly incorporating a five-point Likert scale and ranking questions was developed. The

instrument was piloted amongst selected representative groups consisting of various levels of management from different decision-making streams. Feedback gathered from the pilot study was used as input to amend the questionnaire by improving the grammar, sentence construction and removal of ambiguity. The questionnaire was distributed via electronic mail using a secure and trusted website to targeted respondents from various levels of decision-making within the organisation. The questionnaire was designed so that the respondents were forced to answer all questions within a section before attempting the next section. This ensured that no questions were left unanswered in a section. The questionnaire also prevented the respondents from entering unnecessary or unrelated data. This guaranteed trusted, appropriate and reliable responses to the questions.

Sampling procedure

The population of this study was a large organisation (2 272 employees) representative of an organisation in the financial and banking industry. The representative sample size was 1 200.Participants who are directly involved in or contribute towards strategising for ICT adoption were part of the identified target population and served as the unit of analysis in this study. This included executive, middle, line and operational managers employed in the organisation in which the study was undertaken. In addition, selected levels of employees from the organisation who do not occupy management positions but occupy positions of functional responsibility, and who are capable of potentially influencing decision-makers, were also selected to be part of the target group. Ultimately, the sample population selected was stratified for job levels.

Response rate

Of the 1 200 targeted respondents, only n=352 participants completed the questionnaire successfully. This indicates a response rate of 29%. Four hundred and thirty three (433) respondents attempted to complete the questionnaire. However, after reading the introduction that set the context of the questionnaire, thirty three (33) respondents did not continue to complete the survey. This could have been as a result of self-determined inadequate knowledge of or exposure to the subject on the side of the respondent. Any number of reasons could be speculated as to why the other 56 respondents who attempted section 1 did not successfully complete the rest of the questionnaire. This could

range from lack of time, inadequate knowledge on the subject, lack of exposure to or involvement of the respondent towards the subject matter, operational issues and the like.

Data analysis procedures

'Data and theory triangulation' was used in analysing the data where patterns were identified from the data. Data gathered from informal discussions and questionnaire responses was used to extract as much richness as possible to corroborate some fact or phenomenon. The online questionnaire safeguarded the reliability and accuracy of the data by preventing respondents from entering invalid or inaccurate data. This was made possible by presenting the respondents with a list of pre-defined responses for each question. This eliminated the need to clean the data, as unwarranted data was not captured. Only completed responses were included in the final analysis.

Exploratory factor analysis (EFA) was undertaken and Cronbach alpha coefficients were calculated to assess the validity and reliability of the scales, so measuring the factors under investigation. As high correlations within factors were expected, an oblique rotation was executed. Descriptive statistics were calculated to summarise the sample data and correlation coefficients in order to establish relationships between the factors under investigation. Finally, an analysis of variance (ANOVA) was used to test for significant differences between means for factors under investigation. Two assumptions must be satisfied before an ANOVA can be done (StatSoft, Inc., 2013). Firstly, the residuals must be distributed normally and, secondly, the variances must be equal. Initially the data did not comply with the assumptions. However, once a Normal Blom Transformation was performed, the data complied with the assumptions. Thus, both requirements were met. A Kruskal–Wallis test was performed on ranked raw data to allow for the comparison of more than two independent groups. Further investigation was necessary where significant differences were observed in the data. A PostHoc test was performed to do pair wise comparisons and the least square means t-test was used for this.

Empirical findings

Description of the population demographics

The respondents included males and females from decision-making positions and individuals with the potential to influence decision-makers from various organisational business units. These individuals were identified from a specific *broad band*, which indicates their levels of seniority and managerial context within the organisation. An analysis of the demographic data indicates that 55% of respondents are male and 63% are respondents older than 40 years of age, which indicates a senior demographic sample. A total of 29% are in possession of a diploma or certificate, indicating a more specialised field of qualification, whereas 39% are in possession of a postgraduate degree, indicating a skilled user group. Of the respondents, 24% are from the technology business unit. This is the highest response rate compared to other departments and could mean that these respondents could identify with the survey because of their functional roles. The job function indicates a fair spread of respondents with a higher percentage from the operational levels.

Construct validity of the measuring instrument

Exploratory factor analysis (EFA) was conducted to assess the construct validity of the measuring instrument used in this study. Loadings of greater than 0.25 were considered as useful for inclusion. Table 7-3 indicates the oblique rotated factor loadings and shows that all items loaded well on their constructs. A total of twenty-six (26) of the original 30 items loaded successfully. The 4 items that did not load were eliminated from further statistical analysis. The 26 items were grouped into 5 factors and each factor was named accordingly, based on the variables within the factor. Together, the 5 factors explained 42% of the overall variance. An analysis of the items in each factor confirmed that the 5 constructs measured are in accordance with the intentions of the instrument. The constructs in order of eigenvalues (Table 7-3) are as follows:

Factor 1:	Decision drivers	Positive factors that provide the impetus to adopt technology.
Factor 2:	Decision inhibitors	ICT barriers that delay or preclude its adoption.
Factor 3:	Organisational readiness	Internal aspects that set the tone for ICT adoption.
Factor 4:	Pace of innovation	Rate (innovative) and speed (timing of release) at which

technology is developed and introduced to the market.

Factor 5: Established technology Implemented technologies that are diffused and stabilised within the organisation.

Table 7-3 portrays the items within each factor.

Table 7-3: Factor matrix: rotated factor loadings with factor items

Statements	Decision drivers	Decision inhibitors	Organisational readiness	Pace of innovation	Established technology
The availability of resources internally and externally supports the technology.	**0.8630**	-0.0380	0.0180	-0.1100	0.0350
Ease of use (in relation to business function and implementation) is associated with the technology.	**0.7740**	0.0950	-0.0500	-0.0030	0.0010
There is sufficient availability of knowledge or expertise about the technology.	**0.6750**	-0.0430	-0.0100	0.2390	0.0680
Technology characteristics are in favour of increased operational effectiveness.	**0.6750**	0.1340	0.0050	0.0440	-0.0760
Top management supports the adoption of new technology and has a positive attitude.	**0.5360**	0.0080	0.1420	0.1000	0.0120
There is poor perceived user satisfaction and user experience regarding usability of the new technology.	-0.0300	**0.8140**	0.0450	-0.0490	-0.1200
There is uncertainty regarding the business benefit associated with the technology.	0.0530	**0.7530**	0.0440	-0.1250	-0.0520
There is an adverse organisational culture towards the adoption of new technology.	-0.1180	**0.5940**	-0.0400	0.1550	0.0380
There is a c complex internal decision-making process for the adoption of new technology.	0.0820	**0.5210**	-0.2080	-0.0190	0.1250
There is poor availability of multiple vendor support for the new technology.	0.2030	**0.4580**	0.0880	-0.0300	0.0620
The is a high initial demand for investment to implement the new technology	0.0610	**0.3380**	0.0310	0.1440	0.0660
The organisational policies easily provide for the adoption of new technologies.	-0.0400	-0.0220	**0.7550**	-0.0680	-0.0080
A good working relationship exists between business units and the ICT department	-0.1260	-0.0210	**0.6090**	0.0830	-0.0380
It is easy to obtain budget approval for the adoption of new technology for strategic business projects.	0.1130	0.0090	**0.5320**	-0.1770	-0.0810
The organisational culture adopts a technology focus view when searching for solutions that address operational efficiency.	0.0980	0.0840	**0.4600**	0.1570	0.1430
The organisational culture adopts a technology focus view when searching for solutions that address the business strategic objectives.	0.1170	0.0020	**0.4420**	0.1770	0.0050
There is a reliance on strategic planning tools and processes to assist decision-makers with strategic business decisions.	0.1000	0.0230	**0.4050**	0.0530	0.1040
The business unit depends on the ICT department for guidance on what technology to adopt that would best meet its business objectives.	-0.0160	-0.0200	**0.3880**	0.0650	0.0980
The speed at which technology innovation is progressing influences business decisions when adopting new technology.	0.1630	0.0180	0.1210	**0.5950**	-0.0890
Given the rapid pace of innovation in technology with potential benefits to strategic	-0.0990	-0.0120	0.0760	**0.5890**	0.0260

objectives, management has no choice but to adopt new technology.					
It is important that I keep abreast of technological innovations.	0.0610	0.0210	-0.0170	**0.5150**	-0.1220
The demand on management's ability to execute day-to-day duties increases in complexity as a result of technology innovation.	-0.0130	-0.0090	-0.0260	**0.4950**	0.0710
There is a need to stay abreast of the latest technology.	0.1800	-0.0420	0.1150	**0.4730**	0.0220
My personal experience and exposure towards technology influence my business decisions when recommending the adoption of new technology.	0.0340	0.1150	-0.0300	**0.2820**	0.0700
When adopting new technology its compatibility with existing infrastructure outweighs the importance of its potential strategic business benefit.	0.0000	-0.0040	0.0480	-0.0820	**0.8760**
When adopting new technology its stability with existing technology outweighs potential strategic benefits.	0.0030	-0.0030	0.0200	-0.0150	**0.7570**
Number of items in factor	5	6	7	6	2
Eigenvalue	5.6362	2.9416	1.8778	1.7123	1.3596
% Variance explained by the factor	19.33	7.61	6.88	4.60	3.64
% Cumulative variance explained by the factor	19.33	26.94	33.82	38.42	42.06
Cronbach Alpha	0.8566	0.7747	0.7396	0.6893	0.7948
Mean	4.1557	3.8367	3.3462	4.0663	3.3580
Standard Deviation	0.7780	0.6912	0.6895	0.5997	0.9427

The research instrument was confirmed as reliable and valid for further analysis. The standard deviation and variance indicate a close relationship within the entire data set. An inspection of the correlations between the factors was done to ensure that they were indeed independent.

Influence of independent demographic variables on factors

An ANOVA was done with the scores of the factors as dependent variables to determine if these factors were influenced by various demographic factors. Four independent variables were measured against the scores of five dependent factors. The independent demographic variables were *decision-making by management only, decision-making by individuals, level of education,* and *job function.*

Table 7-4: Analysis of variance for decision drivers

Source	DF	F Value	Pr > F
Decision-making by management only	3	0.37	0.7717
Decision-making by individuals	3	3.54	0.0149*
Level of education	3	3.32	0.0200*
Job function	3	0.06	0.9817
* Significant on 5% level			
Analysis of independent variables			

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Decision-making by individuals	N	Mean*	Std-Dev
Strongly disagree/Partially disagree	61	3.8590^a	0.9962
Neutral	65	4.1169^{ab}	0.6499
Partially agree	139	4.2532^{bc}	0.7185
Strongly agree	87	4.2368^c	0.7412
Level of education			
Matric or less	41	4.3415^b	0.6152
Diploma or certification	104	4.1692^{ab}	0.7822
Degree	70	4.2600^b	0.7137
Postgraduate degree	137	4.0365^a	0.8357
* Means with different superscripts differ significantly on a 5% level.			

Table 7-4 indicates that *decision drivers* vary depending on how respondents perceive their level of individual decision-making and their level of education. A significant group of respondents measured a high score on *decision-making by individuals* for *decision drivers.* This may be indicative of individual perceptions, whereby individuals believe that they are able to make a difference in decision-making for ICT adoption. Respondents with postgraduate education measured low on *level of education* for *decision drivers.* Chi-square tests on responses for *level of education* indicated a significant difference between respondents from the ICT department (p=0.02) compared to all other departments in the organisation. Respondents from the ICT department measured higher on the under-graduate qualifications, while respondents from all other departments measured higher on postgraduate qualifications. One can speculate that ICT is a specialised field and, as such, requires specialised certification and may be the motivation why respondents with a postgraduate qualification measured low for *decision derivers.*

The ANOVA identified no influence on the *decision inhibitors* factor by *decision-making by management only* and *job function.* Therefore, these were not explored further and no data is reported in this paper. The same was true for *pace of innovation.*

Table 7-5 indicates that *decision-making by individuals* and *level of education* influence *organisational readiness.* Individually, respondents perceived that they were able to contribute towards *organisational readiness* more than through collaborations. One can speculate that this influence stems from their day-to-day operations. Respondents with *postgraduate degrees* measured low on *organisational readiness.* One can speculate that ICT is influenced by a specialised skills set more than generic qualifications.

Table 7-5: Analysis of variance for organisational readiness

Source	DF	F Value	Pr > F
Decision-making by management only	3	0.320	0.8117
Decision-making by individuals	3	9.150	<.0001**
Level of education	3	6.010	0.0005**
Job function	3	0.950	0.4167
** Significant on 1% level			
Analysis of independent variables			
Decision-making by individuals	**N**	**Mean***	**Std-Dev**
Strongly disagree/Partially disagree	61	3.0304^a	0.6926
Neutral	65	3.2505^a	0.5836
Partially agree	139	3.4789^b	0.6689
Strongly agree	87	3.4269^b	0.7220
Level of education			
Matric or less	41	3.5017^a	0.7215
Diploma or certification	104	3.5275^a	0.6298
Degree	70	3.3265^a	0.6240
Postgraduate degree	137	3.1721^b	0.7160
** Means with different superscripts differ significantly on a 1% level			

Table 7-6 indicates that *decision-making by management only* and *level of education* influence *established technology*. Those in agreement with *decision-making by management only* indicated that they were able to influence *established technology* more. One can speculate that due to financial influences on the organisation, respondents perceive that executives have dominance over decision-making where this factor is concerned.

Table 7- 6: Analysis of variance for established technology

Source	DF	F Value	Pr > F
Decision-making by management only	3	3.290	0.0200*
Decision-making by individuals	3	1.160	0.3250
Level of education	3	3.370	0.0188*
Job function	3	0.500	0.6797
* Significant on 5% level			
Analysis of independent variables			
Decision-making by management only	**N**	***Mean**	**Std-Dev**
Strongly disagree/Partially disagree	87	3.0690^a	1.0761
Neutral	88	3.4034^b	0.8018
Partially agree	104	3.5385^b	0.8553
Strongly agree	73	3.3904^b	0.9869
Level of education			
Matric or less	41	3.2561^{ab}	0.8953
Diploma or certification	104	3.6106^b	0.8729
Degree	70	3.2786^{ab}	0.9542
Postgraduate degree	137	3.2372^a	0.9741
* Means with different superscripts differ significantly on a 5% level			

Relationship between management levels and decision-making

A Chi-square test was performed to determine if there was any significant relationship between the various levels of management and decision-making approaches. A p-value of <0.05 indicates a significance on the 5% level.

Table 7-7: Management levels and decision-making approach used – n (%)

Decision-making approach	Level	1–2 (Never/ Sometimes)	3 (Uncertain)	4–5 (Often / Always)
Formal meetings	Strategic	5 (12.20%)	3 (7.32%)	33 (80.49%)
	Senior manager	9 (14.52%)	3 (4.84%)	50 (80.65%)
	Line function	23 (26.44%)	12 (13.79%)	52 (59.77%)
	Operational	40 (24.69%)	28 (17.28%)	94 (58.02%)
	Chi-Square test p-value =0.0108 *			
Formal presentations	Strategic	9 (21.95%)	2 (4.88%)	30 (73.17%)
	Senior manager	17 (27.42%)	5 (8.06%)	40 (64.52%)
	Line function	27 (31.03%)	17 (19.54%)	43 (49.43%)
	Operational	41 (25.31%)	37 (22.84%)	84 (51.85%)
	Chi-Square test p-value =0.0199 *			
Formal workshops	Strategic	8 (19.51%)	3 (7.32%)	30 (73.17%)
	Senior manager	17 (27.42%)	7 (11.29%)	38 (61.29%)
	Line function	31 (35.63%)	21 (24.14%)	35 (40.23%)
	Operational	45 (27.78%)	38 (23.46%)	79 (48.77%)
	Chi-Square test p-value =0.0077 **			
Informal discussions	Strategic	22 (53.66%)	3 (7.32%)	16 (39.02%)
	Senior manager	31 (50%)	7 (11.29%)	24 (38.71%)
	Line function	44 (50.57%)	21 (24.14%)	22 (25.29%)
	Operational	60 (37.04%)	49 (30.25%)	53 (32.72%)
	Chi-Square test p-value =0.0050 **			
Informal meetings	Strategic	24 (58.54%)	14 (9.76%)	13 (31.71%)
	Senior manager	34 (54.84%)	10 (16.13%)	18 (29.03%)
	Line function	45 (51.72%)	23 (26.44%)	19 (21.84%)
	Operational	62 (38.27%)	54 (33.33%)	46 (28.40%)
	Chi-Square test p-value =0.0122 *			
Informal get-togethers	Strategic	23 (56.10%)	4 (9.76%)	14 (34.15%)
	Senior manager	40 (64.52%)	12 (19.35%)	10 (16.13%)
	Line function	48 (55.17%)	24 (27.59%)	15 (17.24%)
	Operational	71 (43.83%)	53 (32.72%)	38 (23.46%)
	Chi-Square test p-value =0.0092 **			
* 0.05 (significant on 5% level) ** 0.01 (significant on 1% level)				

The Chi square values in Table 7-7 varied between significant and highly significant. *Formal meetings, formal presentations* and *formal* worksho*ps* were rated with higher utilisation by *strategic* and *senior* managers than by *line* or *operational* managers. *Informal discussions, informal meetings* and *informal get-togethers; and strategic, senior* and *line* managers tend to be rated as less utilised (the *never* or *sometimes* option). *Operational* managers rated *informal* response evenly. When asked if managers are *able to contribute*

towards their business unit's strategic objectives, 64% of managers from all four levels indicated in their response that they *partially agree* or *strongly agree* towards the statement. This supports participation across all levels of management in decision-making activities.

Discussion of findings

Five ICT adoption factors were extracted by means of EFA and, as confirmed in literature, were identified as theoretical influences of ICT adoption. These were *decision drivers, decision inhibitors, organisational readiness, pace of innovation* and *established technology.* Additionally, the different levels of management's decision-making approaches were scrutinised to determine this influence on ICT adoption.

Perceived organisational importance of technology that impact decision-making
The importance of ICT systems for accomplishing business functions is unquestionable as shown by the high consensus (93.18%) when respondents were asked if '*ICT systems are essential in accomplishing business functions within the organisation*'. This supports a strong organisational requirement for ICT to conduct business operations. Within the strong need for ICT, preference is for selecting technologies that cater for the organisation's strategic need (89.49% supported). Decision-makers therefore consider potential strategic and business value that the technology may provide, prior to its adoption.

Influence of the five identified adoption factors on decision-making
Of the five factors investigated, items within *decision drivers* provide decision-makers with a stronger positive motivation for ICT adoption. However, a strong market acceptance for the technology must exist prior to its adoption into the organisation. *Decision drivers* were viewed as more relevant when respondents perceive that individuals make decisions, compared to when they think there is a collaborative approach to decision-making (see Table 7-4). *Decision inhibitors* support decisions that delay the adoption of ICT when it is perceived to provide little organisational benefit. This is confirmed by the strong correlation between *decision inhibitors* and *organisational readiness,* which suggests that the organisation's structures are supportive of decisions that avoid adoption of technology

where there exists an observation of little or no gain in strategic objectives or operational efficiencies. This trend is common amongst organisations that pursue business value through technology adoption (Cohen *et al.,* 2002; Piva *et al.,* 2003; Gera & Gu, 2004).

The inter-correlations for the rotated factors indicated a positive correlation between *decision inhibitors* and *pace of innovation* suggests that although management is aware of the advancement in technology, managers' individual exposure towards technology influences their decisions regarding its adoption. Management is mindful of disruptive ICT and its influence on *established technology,* however, preference is for decisions that favour stability and compatibility with internal infrastructure. According to the respondents, although they are mindful of innovations in technology the *pace of innovation* did not greatly influence the decision-makers to adopt the technology sooner. One can speculate that the reason for this is that technological innovation usually implies major changes over the former technology (Agarwal & Prasad, 1998:16), which may be the reason why decision-makers are not keen to introduce new technologies into the organisation.

Influence of level of education on decision-making
The respondents with higher levels of education considered *organisational readiness* for ICT adoption as less important than the views of lower qualified respondents. One can speculate that for decision-making from a strategic management point of view, level of education may not be as critical because irrespective of the user's attitude towards the technology, executive decisions to adopt the technology take priority. This may be applicable to ICT adoption, which is of strategic importance to the organisation and may require large investments. This is supported by respondents (75.28%) who were of the opinion that executive management was able to influence ICT adoption decisions, which affected *established technologies* more than individuals could*.* The respondents with postgraduate levels of education did not rate *established technology* as high as respondents with under-graduate levels of education did. A large number of respondents were from the ICT department (24.15%), which may account for specialisation of skills. One can speculate that this may influence management decisions on operational levels more than those occupying senior management levels.

Overall, an analysis of the five factors and the items within each factor provides strong evidence as statistically significant predictors of ICT adoption and thus provide strong support for P_1, stating that *ICT adoption decisions are related to organisational factors* and P_2 stating that *decision-making for ICT adoption is related to level of education*.

Level of management and approach to decision-making

Data analysis of the various praxis and practices performed by individuals provides strong empirical support to indicate that decision-making occurs at all levels. A total of 64% of the respondents indicated that they were able to contribute towards decision-making within the organisation. However, the degree to which these decisions influence strategic objectives needs to be investigated further.

Data analysis on different management decision-making approaches indicates a strong preference towards *formal* decision-making activities (see Table 7-7). Scientific output of the data indicates that although managers prefer a *formal* approach towards decision-making, there is a tendency toward an *informal* approach as indicated in Figure 7-2 by respondents who selected 'Often/Always' for a preferred decision-making approach. In the case of operational managers, one can speculate that this may be in response to faster decision-making to deliver speedy services to their clients. This trend is on the rise as the realm of managers is expanding through new work practices caused by ICT adoption because of technological innovations (Hollenstein, 2002:5). The *formal* approach to decision-making may be specific to the case organisation and may be suggestive that the organisation is more adoptive of traditional methods to strategy formulation. However, as indicated in Figure 7-2, pockets of individuals exist who prefer informal approaches to decision-making and this may be indicative that there is evidence of a shift towards a decentralised approach to decision-making where ICT adoption is concerned.

Figure 7-2: Managerial levels of decision-making (Often/Always)
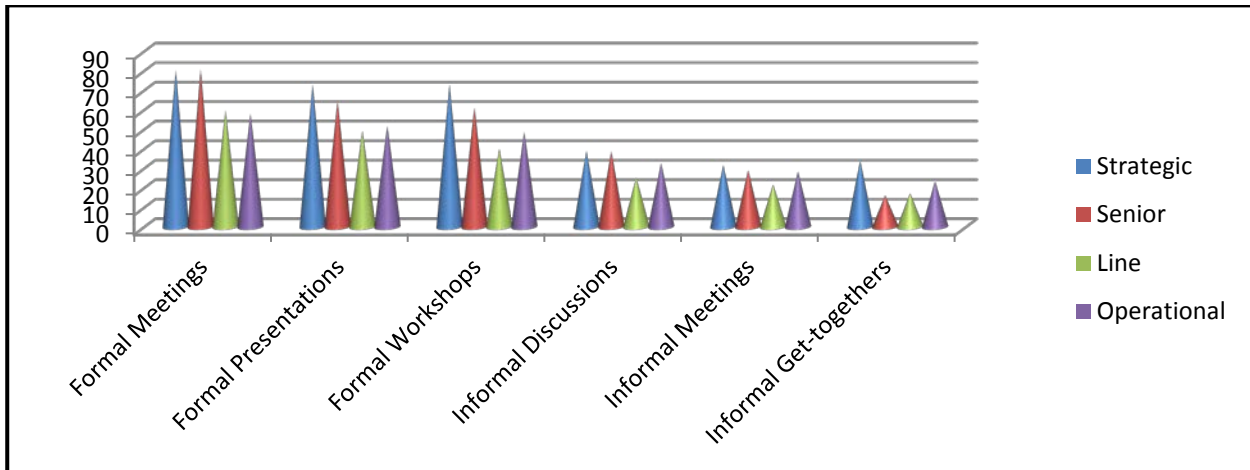
Organisations that intensely pursue ICT adoption as a means of achieving advantage over their rivals will adopt a stronger informal approach to decision-making. As an informal approach to decision-making are less constrained by lengthy approval processes and hierarchical structures. Since the case organisation makes use of ICT adoption mostly as a supportive function in addressing business needs, it may be the reason for the preferred decision-making approach. However, it is worth noting that since managers are shifting towards an informal approach towards decision-making, this is indicative of changes occurring within the organisation, which may be in response to the dynamics in its industry environment. Further investigation is warranted to determine the extent to which this is true.

The analysis of data indicates that there is strong support for P$_3$ stating that d*ecision-making for ICT adoption occurs at various levels within the organisation.*

Decision-making from the practice lens
The items within the constructs provide strong evidence to suggest that the decision-making for ICT adoption in the case organisation are driven by organisational factors that address operational efficiencies over strategic objectives. Therefore, one can speculate that the praxis of managers concerning ICT adoption is geared towards operational efficiencies. The 'organisational readiness' construct provides insight into some of the activities and practices required for decision-making, which include establishment of policies, discourses on ICT between departments, completing budgets, use of ICT tools,

and developing ICT adoption processes. The praxis shed light into the actions of managers. Empirical findings indicate that the approach to decision-making in the case organisation is branching towards an informal style. However, the detail actions of how these activities are performed are unclear and require further research. Additionally, the items within the 'organisational' construct indicate a strong influence of organisational culture on manager's actions. The extent to which this is deemed true needs to be investigated further.

Adoption drivers and inhibitors are indicative of past practices and in the case organisation there is empirical evidence of managers adopting a risk averse attitude towards ICT adoption. One can speculate that this is a result of the type of industry, which favours tried and tested approaches to adoption over 'bleeding edge' technology. The aggregate actor's response indicates that practices of decision-making styles are in favour of formal approaches (policy governed). One can speculate that the case organisation employs a traditional approach to strategy-making. Although there is evidence that 'new' thinking is being integrated into organisational activities. This is evident by the breakaway towards an informal approach to decision-making.

Management and decision-making implications

The framework presented in this paper provides executives with an understanding of how decision-making for ICT adoption takes place at an individual level. The findings indicate that there is a shift in the manner in which decision-making for developing effective strategy occurs. This supports the call by theorists to focus on the micro-activities of strategy. Strategy formulation has progressed somewhat to include input from various lower level managers. It is imperative that management pays close attention to environmental forces when developing strategies, and the strategies themselves need to be flexible enough to accommodate market-pull factors. The key practical implication is that managers must be supportive and should champion an organisational culture that encourages decentralised decision-making to assist in the development of agile strategies for ICT adoption.

It is imperative that strategic management solicits the involvement of line and operational managers, as it is evident from the findings that lower level managers believe they are able to contribute valuably towards decision-making. Items within 'decision drivers' and 'decision inhibitors' does provide some indication that decision-makers rely on past experience when deciding on adoption of technology. The practical implication of this is that past practices may be out-dated in addressing current business challenges. Practitioners need to relook into these practices to determine the relevance of these practices in the contemporary business context. Failing to do so may result in poor ICT adoption decisions. Finally, it is crucial that management realises that although levels of education influence decision-making, it is not fundamentally significant in ICT adoption. Managers with lower level qualifications were able to influences ICT adoption factors far more than managers with higher qualifications were able to. This may be specific to the case organisation as lower level managers were in possession of certifications, which could be the result of the type of ICT skills needed in the case organisation.

Conclusion

The primary objective of this paper was to identify the practical implications of decision-making for ICT adoption, and to understand how strategising for ICT adoption happens in practice. The findings in this paper provide a strong endorsement of the importance of ICT adoption factors and their influence on decision-making for technology adoption. This study confirmed the importance of ICT adoption factors as supported by previous studies (Lee, 2004; Russell & Hoag, 2004; Latham, 2011) and highlighted the importance of level of education as a factor in ICT adoption. In unpacking the micro-activities of the various management levels, practical insight was provided into their praxis and practices. This insight led to the improved understanding of their workings and the association this has with decision-making approaches. Hence, the study achieved its intended goal on improved understanding how ICT adoption happens in practice and the practical implications of decision-making for ICT adoption.

Limitation and suggestions for future research

The limitations of this study are as follows: firstly, it focused on a single case organisation. Although, it is possible to generalise the findings for contextually similar organisations, further research needs to be undertaken to determine the extent to which this is true and if support for these findings is repeatable in other organisations. Secondly, the study was subjected to participant bias, as is the nature with questionnaires (Saunders *et al.*, 2009:110). Attempts were made in the questionnaire to eliminate bias were possible but remained inevitable. Thirdly, the study set out to determine the relationship of the various levels of management in decision-making activity; however, it did not attempt to determine the degree to which these decision-making activities realised into proper strategies. Further research needs to be undertaken to determine the degree to which these decision-making activities materialise into actual strategies and to determine the levels of management that have influence over these strategies. Although decision-making is a practice that is undertaken by all levels of management, further research needs to explore whether these are part of informal structures or part of a distinct formal organisational design. There is a high correlation amongst the five factors and the results of the findings should be evaluated in light of this. Lastly, the findings provided support to indicate that managers with lower level qualifications were able to influence decision-making for ICT adoption. It is worth further investigation to determine whether this was a result of individuals being in possession of specialised qualifications.

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8 PAPER 4: PRIORITISING ICT ADOPTION AND MANAGERIAL VIEWS: THE PRACTICE TURN
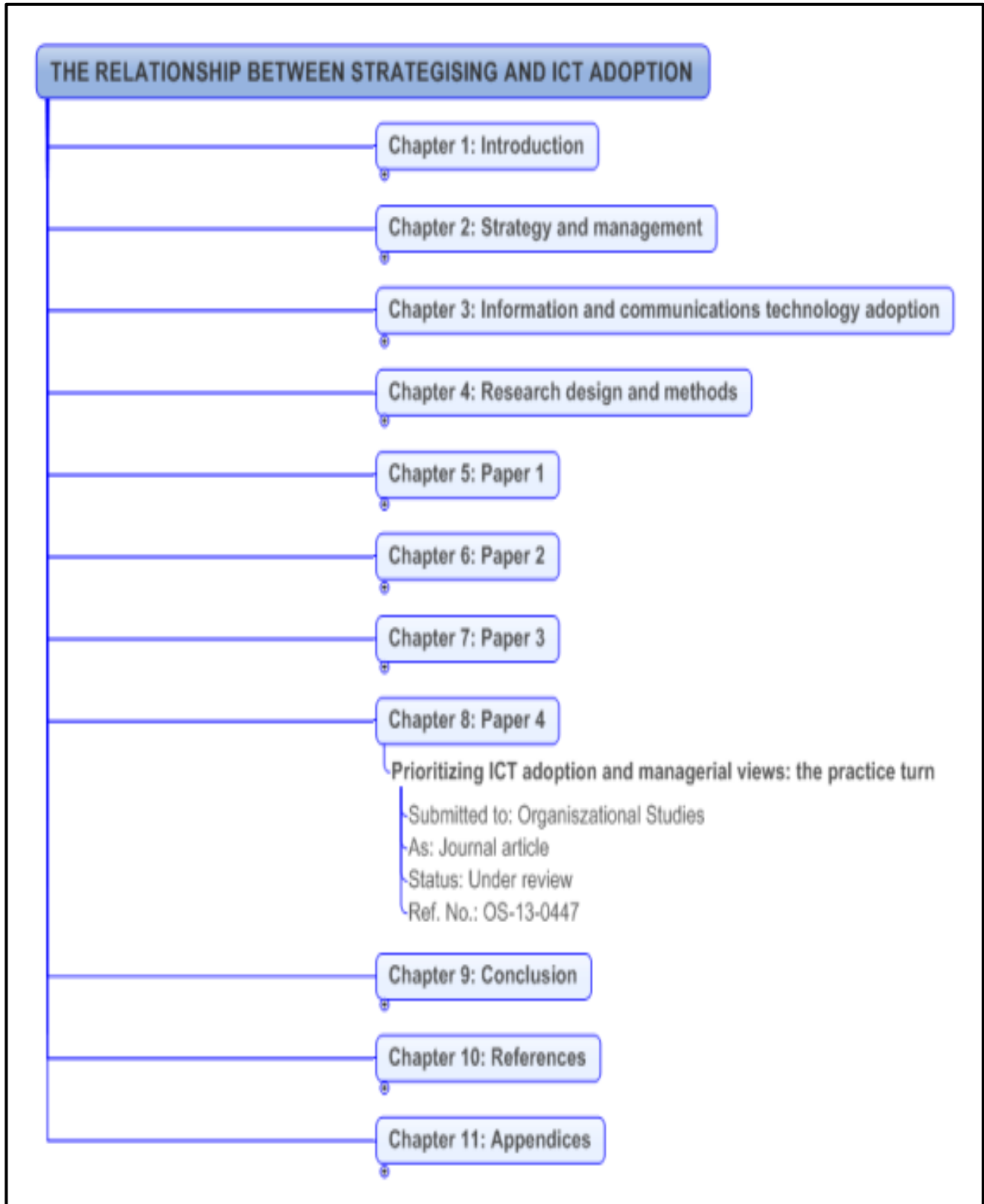
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Prioritising ICT adoption and managerial views: the practice turn

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Abstract

Purpose: The continuous evolution of information and communications technology (ICT) has permeated daily operations of organisations and continues to influence the way in which business is done globally. As an ostensible choice, managers are relying on ICT adoption as a means to improve strategic, tactical and operational processes, as well as to close the technology gap that exists between the organisation and its market environment. Managers in the context of their praxis have different views on priorities of the ICT adoption factors, which addresses their individual work requirements. Thus, through empirical evidence in the context of ICT adoption factors, this paper investigates the aggregate views of ICT adoption factors by different managerial levels. This paper reports on an individual case study, which concentrates on the micro-activities of ICT adoption through the strategy-as-practice lens. It produces insight into strategising for ICT adoption in an attempt to determine the influence that pace of technology has on organisations as management endeavours to stay abreast of the market environment. Through empirical analysis, the study exposes the influence of ICT innovation on different managerial levels and stipulates the critical adoption factors as viewed by the different managerial levels. Finally, this paper aims to enrich the strategy-as-practice body of knowledge with practical insight.

Design/methodology/approach: The inquiry strategy employed in this research is a case study and the method used for data collection is an electronic survey supported by observations and informal discussions.

Findings: The empirical findings provide evidence that the priority of ICT adoption factors vary by different management levels in context of their praxis.

Research limitations/implications: The study makes use of a single case study.

Practical implications: Understanding different managerial views on ICT adoption priorities can influence the types of technology adopted, which has significance impact on the outcome of the adoption.

Originality/value: Determining if the views on ICT adoption vary according to managerial levels.

Keywords: Strategy, Strategy-as-practice, ICT adoption, ICT innovation, Management, Decision-making, Managerial levels

Introduction

With increased levels of worldwide hyperconnectivity, economic integration, ICT advancement and shifting social trends, the modern context within which organisations interact is experiencing growing uncertainty (Eisenhardt *et al.*, 2010:1263). This instability presents a challenge to organisations in that the earlier methods of strategy-making are becoming less effective. The largest contributor towards this instability is innovation, which results from continuous developments in ICT, and this is constantly transforming organisations' operations (Damanpour & Schneider, 2008:503). Thus, new approaches to strategy formulations are required to capitalise on environmental opportunities without inviting unnecessary risks. Modern organisational strategies need to be aligned with the flexibility of the external market to allow the organisation to deal with the market dynamics. As an obvious alternative, organisations are making use of ICT adoption as a means to improve their efficiencies and to close the ICT gap that may occur between the organisation and its environment.

Organisations cannot afford to fall behind the technology curve, or allow the gap between internally established technologies and that of its market to increase, for fear of technology innovation 'disrupting' market profitability and reducing revenues (Walsh *et al.*, 2002:341). It is for this reason that managers have to be watchful of technology developments that take place within their industry. Technology adoption factors empower managers with an understanding of what characteristics to consider when deciding to adopt ICT. Technology adoption serves as the vehicle that allows managers to engage with ICT developments, thereby keeping their organisation current with its environment. However, to do so, managers need to develop flexible strategies that allow the organisation to embrace new environmental developments (Brown & Eisenhardt, 1995:357). In the modern context of strategising, executive managers rely on all levels of management for advice on the strategic direction of the organisation. Strategy formulation, which was seen as the sole responsibility of top management, has progressed to include strategic contributors at all levels within the organisation. In principle, this has created a shift in the approach to strategy formulation.

This approach has given rise to a new school of thought which views strategy as an 'activity' rather than a 'process' (Whittington *et al.*, 2006:618; Jarratt & Stiles, 2010:28). The significant contribution that this change brings to strategy formulation is that it deals with the social practices of strategy (Golsorkhi *et al.*, 2010:1; Vaara & Whittington, 2012:2). It is through this view that this paper identifies the ICT adoption priorities and the managerial views thereof. The aim of this paper is to examine the micro-activities of practitioners', their praxis and practices to understand the priorities placed on ICT adoption factors by different levels of management. Ultimately, this study aims to supplement the strategy-as-practice (s-as-p) body of knowledge on the practical understanding of management's response to ICT adoption in the modern context.

This paper is divided into the following sections; next it describes the research objectives of the paper, which is followed by a literature, study that focuses on strategy-as-practice and managerial challenges in the current business context of ICT adoption. The paper's research methodology is presented thereafter. The empirical findings and discussions precede the conclusion of the paper.

Research question and objectives

In this study, s-as-p provides the framework for which the micro-activities that shape ICT adoption are explored in detail. In keeping with the focus area for this paper as identified in Table 1-1, this paper attempts to answer the following study's overall research question:

What are the priorities placed on ICT adoption factors, as viewed by the different levels of management?

In order to answer this question successfully, this paper's research objective is to:

- recognise the priorities placed on ICT adoption factors, as viewed by the different levels of management; and
- analyse the critical factors that contribute towards ICT adoption for sense-making in the case organisation.

In achieving these objectives, the study aims to explore the following propositions:

- P_1 Different levels of management rank ICT adoption factors the same.
- P_2 Job function contributes towards ICT adoption decisions.
- P_3 Pace of innovation influences management to adopt innovative technology sooner.

Literature study

Strategising from the practice perspective

Strategising in the strategy-as-practice (s-as-p) context focuses on the strategy practitioners, practices and praxis and emphases is on the analyses of the activities and practices that constitute strategising within a given context (Golsorkhi *et al.*, 2010:1). Whittington (2002:c1) and Jarzabkowski *et al.* (2007:9) identifies the practitioners as the 'workers', the practices as the 'tools' and the praxis as the 'work' of strategy. Practices are acknowledged as the 'infrastructure through which micro-strategy and strategising occur' (Jarzabkowski, 2003:24). Strategy practitioners are 'actors', those people who do the work of strategy; strategy practices are the 'material tools' through which the work gets done; and the strategy praxis are the 'actions' that conclude the objective of the strategy (Jarzabkowski & Spee, 2009:70). According to Jarzabkowski *et al.* (2007:8), s-as-p recognises strategising as the 'doing of strategy' and concentrates on the individual activities within the organisational. Previously strategy was viewed as something that organisations 'had'. However, strategy from a practice view is seen as something that individuals 'do' (Jarzabkowski, 2004:529; Chia & MacKay, 2007:223). S-as-p does not only focus on the behaviours or activities of managers within organisations, but also pursues to identify how these behaviours and activities are related to fundamental practices.

S-as-p may be regarded as an alternative to conventional strategy-making. It focuses on the daily practices of people and identifies how these activities shape strategy (Jarzabkowski & Wilson, 2002:358). Activities of strategising include analysis of data, workshops, meetings, making presentations, strategy committees, and preparing formal documents – activities that can significantly contribute towards strategy formulation (Whittington, 2003:117; Hodgkinson *et al.*, 2006:479). S-as-p embraces all conversations,

routines and interactions that contribute towards inspiring and transforming the organisation's direction on a daily basis (Denis *et al.*, 2007:197). There are also motivating aspects to strategising, for example, creative processes, identifying new opportunities and understanding the context of the activities (Whittington, 1996:732). Previously the activities of strategising were viewed as something that only executives performed. However, s-as-p studies indicate that in the modern environment, both middle and lower level employees also contribute towards strategising (Jarzabkowski *et al.,* 2007:12). Strategising indicates the potential of managers to influence organisational activities by shaping strategic decisions from their personal experiences. More importantly contextual differences may arise from the praxis among the different practitioners. Thus, by drawing on the critical aspects of s-as-p, insight into managerial views can be uncovered and an understanding formed of how these views influence ICT adoption actions.

Managerial strategy praxis

There is no doubt that the pace of ICT innovation and the adoption thereof has had a profound effect on the manner in which managers operate. This ultimately influences the approach taken by managers in conducting business activities. Managers are individuals who perform the work of strategy and are the strategists in the process of strategy (Whittington *et al.*, 2006:616). Management's decisions and actions influence the alignment between the organisation's strategies and its environment (Goll *et al.*, 2007:162). Strategic matters are evident from the daily context of management's duties and can contribute towards the strategic objectives of the organisation (Hendry, 2000:958; Chapman, 2001:63; Elter, 2004:6). The priorities placed on ICT adoption factors may vary according to managers' job function, situational context and their technology awareness (Kraut *et al.*, 1989:289; Weber & Kauffman, 2011:689).

When compared to conventional models, management functions are becoming ineffective in response to market forces (Drucker, 1988:3; Spanos *et al.*, 2002:662; Kearns & Sabherwal, 2006:136). The reason for this is that the previous model for strategy-making is rooted by a hierarchical structure that is supported by foreseeable and unchanging environments, whereas modern environments are unpredictable with organisational structures that are supportive of middle and lower level involvement (Mantere & Vaara, 2008:342). Knowledge of how organisations interpret transformation requires awareness

at an individual level (Christensen & Overdorf, 2000:1; Stensaker & Falkenberg 2007:143). This information can contribute towards managers improving efficiencies and enhancing sustainable pursued advantage for the organisation. Thus, decentralised strategy formulation allows key strategic influences to originate from managers at lower levels (Hollenstein, 2002:5; Andersen, 2004:1274).

In the organisational context of work activities, although managers may perform similar activities, they may conceptualise the activities differently. This is attributed to the significance the individual places on the interpretation and purpose of the activity, which stems from their past exposure and cultural understanding (Golsorkhi *et al.*, 2010:134). By examining the collective management behaviour and views towards ICT adoption, insight can be obtained into understanding the priorities placed on adoption factors that ultimately shape decisions. Collective thinking that produces similar rational may be purposive to accomplish complex tasks. Over time, these actions may make sense to decision-makers and may be repeated until they become common practices within the organisation. Therefore, it is important to understand the different views in the context of ICT adoption, to determine the influence this may have on shaping strategic outcomes.

Technology innovation and adoption

ICT adoption usually follows technology innovation and refers to the use of the technology by an individual or an organisation. Technology push and market pull are the driving forces in the process of innovation. However, the technology push is generally greater than the demand created by market pull (Wonglimpiyarat & Yuberk, 2005: 411). Innovation from market-pull is a result of an industry demand that is expressed in the form of a product or service, whereas in technology-push innovation is produced from a gap that exists in the market. Both in market pull and technology push, organisations may be compelled to absorb the innovation depending of the need and potential advantage it offers the organisation. The degree to which an organisation is responsive to new technology influences its tendency towards the adoption thereof (Tarafdar and Vaidya, 2006:428). The need for ICT adoption is driven by the pace and impact of innovation on market forces. Therefore, management decisions are influenced by the rate and speed of adoption. The rate of adoption relates to management's need to introduce innovativeness into the organisation, whereas the speed of adoption relates to the timing of when the innovation

was released into the market. The rate and speed of ICT adoption are closely related to the product or maturity life cycles. Figure 8-1 depicts the technology push and market pull effect.

Figure 8-1: Technology push and market pull forces
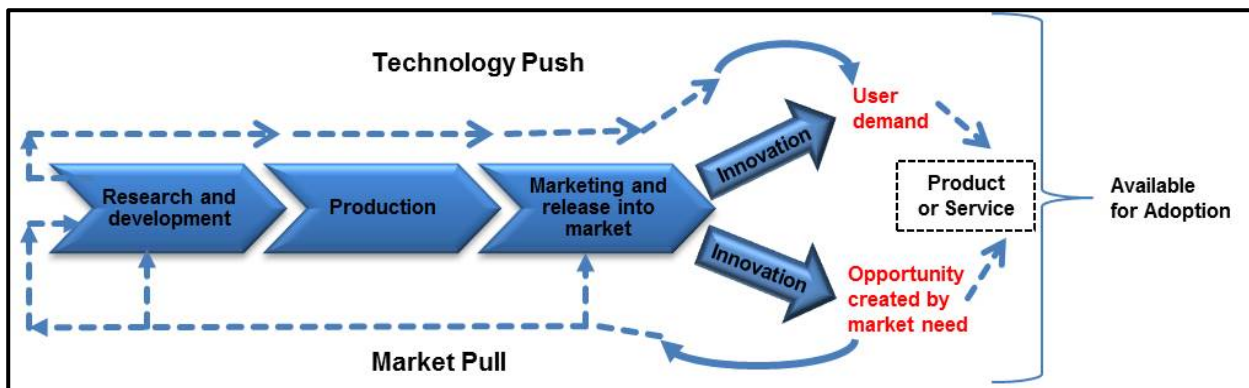
Technology adoption can be categorised into three factors namely organisational, innovative and external. Each of these factors are characterised by attributes that describe some aspect of the factor and can serve to promote or delay adoption decisions. Thus, management views on the adoption of technology are subjected to drivers that positively influence or barriers that postpone or prevent its adoption. Although technology adoption promises to bring business value with strategic benefits, past failures tend to make managers risk averse to the adoption of the very technology that promises strategic advantages. Corrocher and Fontana (2008:231) assert that managers may view barriers to ICT differently depending on individual characteristics, organisational function and market features, which may influence their behaviour.

The adoption of technology is a practice in which managers are influenced by an organisation's capabilities and its user network (Sieber & Valor, 2008:10). Organisational factors are internal aspects set the scene for ICT adoption. It is common practice that internally established technologies are given preference to capitalise off existing investments, unless the organisation intends to exploit emerging technologies by pursuing competitive advantage (Khanagha *et al.*, 2013:53). Other organisational factors that contribute towards ICT adoption include aspects such as culture, degree of risk taking, knowledge and expertise, size and type, budget, top management support and attitude,

maturity, end-user behaviour, information intensity, policies, and interconnectedness. Studies indicate that culture is a key determinant in influencing managers' decisions to adopt ICT (Fink, 1998; Russell & Hoag, 2004; Hollenstein, 2004).

Innovation is defines as 'an iterative process initiated by the perception of a new market and or new service opportunity for a technology-based invention which leads to development, production and marketing tasks striving for the commercial success of the invention' (Garcia and Calantone, 2002:112). Schumpeter (in Chau and Tam, 2000:230) asserts that advances in the underlying scientific base determine the innovation factors. These factors are product-related features, which sway managers to favour or postpone the ICT adoption. It includes characteristics such as relative advantage, compatibility, complexity, observability, operational effectiveness, systems openness, product life cycle or maturity curve, and resource intensiveness.

External factors refer to environmental pressures that shape manager's thinking to support or delay the adoption of technology, depending on the product maturity. As a means of continued existence, external competitive pressures have made it essential for organisations to adopt ICT (Ghobakhloo *et al.*, 2012). Influences of external factors include product life cycle, competitive advantage or pressures, global interdependencies, interconnectedness, and legislation. Tidd *et al.* (in Troshani and Doolin, 2005:4) state that critical factors for the successful adoption of ICT include the ability of the organisation to predict and respond to changes in the industry.

Figure 8-2 summarises the above literature study into a framework, which depicts strategising from an s-as-p perspective and indicates how this, together with ICT adoption factors, influences managerial views on ICT adoption. This coupled with job context, managerial praxis and past exposure to technology adoption creates a unique perspective for each manager, which can influence his or her thinking on ICT adoption. By aggregating the collective views of managers on the same job levels comparisons can be made among managers on different job levels. The outcomes can shed valuable insight into manager's praxis and their views on ICT adoption factors.

Figure 8-2: Framework for prioritising ICT adoption factors: managerial view
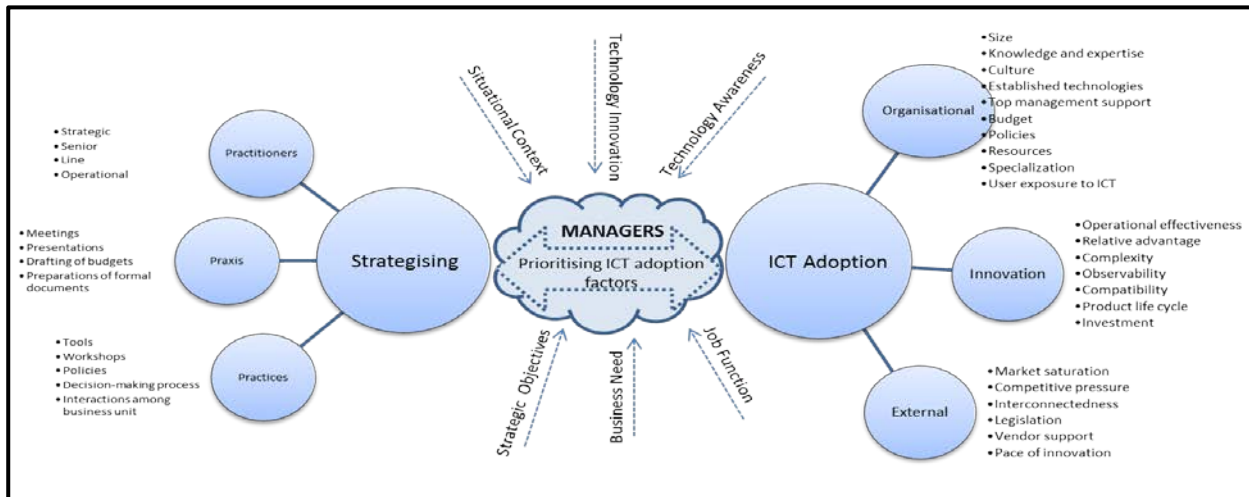
Source: Own compilation.

Research methodology

This section provides an overview of the research approach adopted in this study. Case study was used as a research strategy, as it is differentiated by its ability to investigate the phenomenon of strategising for ICT adoption. The information used to develop the research instrument were based on input from theoretical information, observable facts and actual feedback gathered from the pilot study. Table 8-1 integrates the overall research design components.

Table 8-1: This study's' research design components

Component	Description
Research question	What critical factors influence ICT adoption as viewed by various levels of management?
Context	Case study in a large organisation
Propositions*	P_1 Different level of management rank ICT adoption factors the same. P_2 Job function contributes towards ICT adoption decisions. P_3 Pace of innovation influences management to adopt innovative technology sooner.
Unit of investigation/analysis	Primary – managers' views and priorities for ICT adoption Secondary - factors influencing ICT adoption
Unit of observation	Managers at different levels with different job functions within the organisation
Logic linking the data to the propositions	The perceptions of different levels of management on how they strategise can direct an understanding of ICT adoptions.

Component	Description
Criteria for interpreting the findings	Identified key factors for ICT adoption were used to interpret the propositions by seeking support or no support.
* = Propositions are set to structure the research process in support of the research question. Research questions are converted to statements for which support (or not) is sought	

Source: Adapted from Yin (2003:21).

Paper contextualisation

The research problem identified in this paper is part of a larger study concerning ICT adoption. This paper reports only on the views and priorities placed on ICT adoption by the different levels of management. The ranking of ICT adoption factors provides statistical evidence on interpretations of organisational issues, as viewed by the different levels of management.

Research design

The inquiry strategy used in this study was a case study, which attempted to answer the research objectives and to explain a phenomenon in a real world context where the boundaries between the phenomena and context may not be clear. This choice is supported by Yin (2003:40) in that a single case study may be used where the case is representative or typical of an everyday commonplace situation and where the case may be revelatory. The study made use of a research instrument in the form of a questionnaire to answer the research questions. A quantitative approach was chosen in this study because the research wanted to answer questions about the complex nature of the phenomena, focusing on describing and understanding the phenomena from the point of view of the participants.

Data collection

Although this study made use of a questionnaire as the primary source of data in an attempt to answer the research questions, it also relied on informal discussions as a means to gather information, which assisted in formulating the questions used in the questionnaire. The informal discussions focused on factors relating to ICT adoption, current organisational management 'pain points' and strategising. The purpose of the informal discussions was to gain additional information from organisational experts on the current challenges facing managers. The information gathered served to confirm the

information obtained from the research. Both research and the information obtained from informal discussions formed the basis of the questions used in the research instrument. A self-administered online questionnaire incorporating a five-point Likert scale and ranking questions was developed. The questionnaire was distributed via electronic mail using a secure and trusted website to targeted respondents from various levels of decision-making within the organisation.

Sampling procedure

The researcher made use of a representative *(probability) sampling* technique which was selected so that inferences could be made from the sample population to answer the research questions. The questionnaire was executed within the case organisation where only individuals in management positions and individuals with the potential to influence decisions were identified as the sample population. These individuals were identified by their job levels within the organisation. No names were requested from the respondents in order to maintain anonymity of the responses, Job levels was used to differentiate the different management positions. Thus, a stratified random sampling technique was used. This was purposefully done with the intention of obtaining subsets of data that was identified by the different management levels. The population of this study was a large organisation (2 272 employees) representative of an organisation in the financial and banking industry. The representative sample size was 1 200. Ultimately, the sample population was selected was stratified for job levels.

Response rate

The questionnaire provided sufficient anonymity for the respondents to be open and honest in their responses. While the questionnaire provided a means for more accurate responses, not all respondents completed the questionnaire. Of the 1 200 targeted respondents, only n=352 participants completed the questionnaire successfully. This indicates a response rate of 29%. Four hundred and thirty three (433) respondents attempted to complete the questionnaire. However, after reading the introduction that set the context of the questionnaire, thirty three (33) respondents did not pursue to complete the survey. This could have been as a result of self-determined inadequate knowledge of or exposure to the subject on the side of the respondent. Any number of reasons could be speculated as to why the other 56 respondents who attempted section 1 did not

successfully complete the rest of the questionnaire. This could range from lack of time, inadequate knowledge on the subject, lack of exposure to or involvement of the respondent towards the subject matter, operational issues and the like.

Data analysis procedures

Although this study made use of a single organisation as a unit of analysis, 'data and theory triangulation' was used in analysing the data. Data gathered from informal discussions and questionnaire responses was used to extract as much richness as possible to corroborate some fact or phenomenon. Patterns were identified from the data. Exploratory factor analysis (EFA) was undertaken and Cronbach alpha coefficients were calculated to assess the validity and reliability of the scales, so measuring the factors under investigation. As high correlations within factors were expected, an oblique rotation was executed. Descriptive statistics were calculated to summarise the sample data and correlation coefficients in order to establish relationships between the factors under investigation. Finally, an analysis of variance (ANOVA) was used to test for significant differences between means for factors under investigation. Two assumptions must be satisfied before an ANOVA can be done (StatSoft, Inc., 2013). Firstly, the residuals must be distributed normally and, secondly, the variances must be equal. Initially the data did not comply with the assumptions. However, once a Normal Blom Transformation was performed, the data complied with the assumptions. Thus, both requirements were met. A Kruskal–Wallis test was performed on ranked raw data to allow for the comparison of more than two independent groups. Further investigation was necessary where significant differences were observed in the data. A PostHoc test was performed to do pair wise comparisons and the least square means t-test was used for this.

Empirical findings

Demographics

An analysis of the demographic data indicates that 55% of respondents are male and 63% are respondents older than 40 years of age, which indicates a senior demographic sample. A total of 29% are in possession of a diploma or certificate, indicating a more specialised field of qualification, whereas 39% are in possession of a postgraduate degree, indicating a skilled user group. Of the respondents, 24% are from the technology business unit. This

is the highest response rate compared to other departments and could mean that these respondents could identify with the survey because of their functional roles. The job function indicates a fair spread of respondents with a higher percentage from the operational levels.

Construct validity of the measuring instrument

Exploratory factor analysis (EFA) was conducted to assess the construct validity of the measuring instrument used in this study. Loadings of greater than 0.25 were considered as useful for inclusion. Table 8-2 indicates the oblique rotated factor loadings and shows that all items loaded well on their constructs. A total of twenty-six (26) of the original 30 items loaded successfully. The 4 items that did not load were eliminated from further statistical analysis. The 26 items were grouped into 5 factors and each factor was named accordingly, based on the variables within the factor. Together, the 5 factors explained 42% of the overall variance. An analysis of the items in each factor confirmed that the 5 constructs measured are in accordance with the intentions of the instrument. The constructs in order of eigenvalues (Table 8-2) are as follows:

Factor 1: Decision drivers	Positive factors that provide the impetus to adopt technology.
Factor 2: Decision inhibitors	ICT barriers that delay or hinder ICT adoption.
Factor 3: Organisational readiness	Internal aspects that set the tone for ICT adoption.
Factor 4: Pace of innovation	Rate (innovative) and speed (timing of release) at which technology is developed and introduced to the market.
Factor 5: Established technology	Implemented technologies that are diffused and stabilised within the organisation.

Table 8-2: Factor matrix – Rotated factor loadings

Number of items in factor	5	6	7	6	2
Eigenvalue	5.6362	2.9416	1.8778	1.7123	1.3596
% Variance explained by the factor	19.33	7.61	6.88	4.60	3.64
% Cumulative variance explained by the factor	19.33	26.94	33.82	38.42	42.06
Cronbach Alpha	0.8566	0.7747	0.7396	0.6893	0.7948
Mean	4.1557	3.8367	3.3462	4.0663	3.3580
Standard Deviation	0.7780	0.6912	0.6895	0.5997	0.9427

The research instrument was confirmed as reliable and valid for further analysis. The standard deviation and variance indicate a close relationship within the entire data set. An

inspection of the correlations between the factors was done to ensure that they were indeed independent.

The correlations between the 5 constructs are shown in Table 8-3 and indicate the scale inter-correlations for the rotated factors. The correlation coefficients for *decision drivers*, p*ace of innovation* and *established technology* were close, and indicate that the factor items positively influence one another when deciding to adopt ICT. The correlation coefficient of *decision inhibitors* to *organisational readiness* indicates that items within *decision inhibitors* negatively influence *organisational readiness*. This implies that *decision inhibitors* create a barrier that delays the adoption of technology within the organisation.

Table 8-3: Scale inter-correlations for the rotated factors (p-value = brackets)

Item:	Decision drivers	Decision inhibitors	Organisational readiness	Pace of innovation	Established technology
Decision drivers	1.000				
Decision inhibitors	0.41072 (<.0001)	1.000			
Organisational readiness	0.37029 (<.0001)	0.02904 (0.5871)	1.000		
Pace of innovation	0.39104 (<.0001)	0.21808 (<.0001)	0.33578 (<.0001)	1.000	
Established technology	0.12970 (0.0149)	0.15085 (0.0046)	0.17450 (0.0010)	0.15068 (0.0046)	1.000

Influence of independent demographic variables on factors

An ANOVA was done with scores of the factors as dependent variables to determine if these factors were influenced by various demographic factors. Four independent variables were measured against the scores of five dependent factors. The independent demographic variables were *decision-making by management only, decision-making by individuals, level of education,* and *job function.*

Table 8-4: Analysis of variance for decision drivers

Source	DF	F Value	Pr > F
Decision-making by management only	3	0.37	0.7717
Decision-making by individuals	3	3.54	0.0149*
Level of education	3	3.32	0.0200*
Job function	3	0.06	0.9817
* Significant on 5% level			
Analysis of independent variables			
Decision-making by individuals	**N**	**Mean***	**Std-Dev**
Strongly disagree / Partially disagree	61	3.8590[a]	0.9962

Neutral	65	4.1169^{ab}	0.6499
Partially agree	139	4.2532^{bc}	0.7185
Strongly agree	87	4.2368^c	0.7412
Level of education			
Matric or less	41	4.3415^b	0.6152
Diploma or certification	104	4.1692^{ab}	0.7822
Degree	70	4.2600^b	0.7137
Postgraduate degree	137	4.0365^a	0.8357
* Means with different superscripts differ significantly on a 5% level.			

Table 8-4 indicates that *decision drivers* vary depending on how respondents perceive their level of individual decision-making and their level of education. A significant group of respondents measured a high score on *decision-making by individuals* for *decision drivers.* This may be indicative of individual perceptions, whereby individuals believe that they are able to make a difference in decision-making for ICT adoption. Respondents with postgraduate education measured low on *level of education* for *decision drivers.* Chi-square tests on responses for *level of education* indicated a significant difference between respondents from the ICT department (p=0.02) compared to all other departments in the organisation. Respondents from the ICT department measured higher on the under-graduate qualifications, while respondents from all other departments measured higher on postgraduate qualifications. One can speculate that ICT is a specialised field and, as such, requires specialised certification and may be the motivation why respondents with postgraduate qualification measured low for *decision derivers.*

The ANOVA identified no influence on factors *decision inhibitors* and *pace of innovation* by *decision-making by management only* and *job function.* Therefore, these were not explored further and no data is reported on this factor.

Table 8-5: Analysis of variance for organisational readiness

Source	DF	F Value	Pr > F
Decision-making by management only	3	0.320	0.8117
Decision-making by individuals	3	9.150	<.0001**
Level of education	3	6.010	0.0005**
Job function	3	0.950	0.4167
** Significant on 1% level			
Analysis of independent variables			
Decision-making by individuals	**N**	**Mean***	**Std-Dev**
Strongly disagree/Partially disagree	61	3.0304^a	0.6926
Neutral	65	3.2505^a	0.5836
Partially agree	139	3.4789^b	0.6689

Strongly agree	87	3.4269[b]	0.7220
Level of education			
Matric or less	41	3.5017[a]	0.7215
Diploma or certification	104	3.5275[a]	0.6298
Degree	70	3.3265[a]	0.6240
Postgraduate degree	137	3.1721[b]	0.7160
** Means with different superscripts differ significantly on a 1% level			

Table 8-5 indicates that *decision-making by individuals* and *level of education* influence *organisational readiness.* Individually, respondents perceived that they were able to contribute towards *organisational readiness* more than through collaborations. One can speculate that this influence stems from their day-to-day operations. Respondents with *postgraduate degrees* measured low on *organisational readiness.* One can speculate that ICT is influenced by a specialised skills set more than generic qualifications.

Table 8-6: Analysis of variance for established technology

Source	DF	F Value	Pr > F
Decision-making by management only	3	3.290	0.0200*
Decision-making by individuals	3	1.160	0.3250
Level of education	3	3.370	0.0188*
Job function	3	0.500	0.6797
* Significant on 5% level			
Analysis of independent variables			
Decision-making by management only	**N**	***Mean**	**Std-Dev**
Strongly disagree/Partially disagree	87	3.0690[a]	1.0761
Neutral	88	3.4034[b]	0.8018
Partially agree	104	3.5385[b]	0.8553
Strongly agree	73	3.3904[b]	0.9869
Level of education			
Matric or less	41	3.2561[ab]	0.8953
Diploma or certification	104	3.6106[b]	0.8729
Degree	70	3.2786[ab]	0.9542
Postgraduate degree	137	3.2372[a]	0.9741
* Means with different superscripts differ significantly on a 5% level			

Table 8-6 indicates that *decision-making by management only* and *level of education* influence *established technology.* Those in agreement with *decision-making by management only* indicated that they were able to influence *established technology* more. One can speculate that due to financial influences on the organisation, respondents perceive that executives have dominance around decision-making where this factor is concerned.

Prioritising of ICT adoption factors by different manager levels

The ranking of general ICT adoption factors is presented in Table 8-7. Managers ranked *contribution towards operational effectiveness* as most important. An analysis of the data indicates that lower level managers perceived business benefit derived from the technology as more important to the organisation. *Contribution to strategic business value* was ranked as the second most important by all managers and was viewed as most important by *strategic managers.* It is evident from the data that *strategic* managers understand the importance of ICT in achieving strategic objectives, and one can speculate that in the case organisation the view held by *strategic* managers is that technology may be core to their business function. Significant differences were found in the responses on a $p < 0.05$ level between the *strategic* managers and *line* managers, and *strategic* managers and *operational* managers. One can speculate that strategic managers understand the criticality of achieving strategic objectives, which is why their focus may be on strategic benefits more than on business benefit. *Product maturity* is ranked fifth amongst all managers. One can speculate that job function maybe a contributing factor as the case organisation does not make use of technology to pursue advantage and, as such, may not be as sensitive in following the progress of technology.

Table 8-7 Ranking of general ICT adoption factors [p-value*/rank]

Contribution towards operational effectiveness [0.1800/1st]	Mean	Std-Dev
Strategic	2.1463	1.1305
Senior Manager	1.9032	1.0513
Line function	1.7586	1.0112
Operational	1.9691	1.0830
Keep abreast of the latest technology trends [0.147/4th]		
Strategic	3.8780	1.3819
Senior Manager	3.5806	1.5423
Line function	3.3218	1.3935
Operational	3.3580	1.4979
Product maturity (how stable and widely adopted the technology) [0.7168/5th]		
Strategic	3.4146	0.8937
Senior Manager	3.5000	1.0827
Line function	3.5632	0.9239
Operational	3.4012	1.0890
Compatibility and stability with existing internal technology [0.8484/3rd]		
Strategic	3.4146	1.0949
Senior Manager	3.3710	1.0120
Line function	3.2759	1.2074
Operational	3.2099	1.2026
Contribution to strategic business value [0.0034*/2nd]		
Strategic	2.1463	1.5582
Senior Manager	2.6452	1.5481
Line function	3.0805	1.6651

Operational		3.0617	1.6140
Pairwise PostHoc Comparison		ZSTAT	SE
	Strategic – Senior Manager	1.5	19.84
	Strategic – Line function	3.13*	18.67
	Strategic – Operational	3.25*	17.23
	Senior Manager – Line function	1.75	16.38
	Senior Manager – Operational	1.79	14.72
	Line function – Operational	0.18	13.10
* Significant difference on 0.05% level			

The ranking of external ICT adoption factors is presented in Table 8-8. The Kruskal–Wallis test showed no significant difference in responses. *Stable technology that is widely adopted* was ranked as the most important external factor, followed by *technology that is widely compatible with other technology.* It is evident from the output that this is a common view shared amongst all managers and may be specific to the case organisation, which is an indication of the type and nature of its business. The organisation is not driven by innovative technology nor does it adopt 'bleeding edge' technology.

Table 8-8: Ranking of external ICT adoption factors [p-value*/rank]

	Mean	Std-Dev
Stable technology that is widely adopted [0.4898/1st]		
Strategic	2.5366	1.3982
Senior Manager	2.1774	1.1239
Line function	2.1954	1.3454
Operational	2.1975	1.2846
Technology that provides high return on investment [0.9107/3rd]		
Strategic	2.7805	1.3695
Senior Manager	2.9032	1.6958
Line function	2.6782	1.4587
Operational	2.7901	1.4636
Technology that is widely compatible with other technology [0.1665/2nd]		
Strategic	2.3902	1.1593
Senior Manager	2.5806	0.9504
Line function	2.6552	1.0210
Operational	2.7160	1.0060
Multiple available vendor support for the technology [0.18/5th]		
Strategic	3.6829	1.1498
Senior Manager	3.7258	1.0584
Line function	3.7241	1.0964
Operational	3.8148	0.9983
Technologies that adhere to legislation [0.7249/4th]		
Strategic	3.6098	1.4980
Senior Manager	3.6129	1.4861
Line function	3.7471	1.3995
Operational	3.4815	1.6083

The ranking of innovative ICT adoption factors is presented in Table 8-9 and indicates no significant difference in responses amongst managers. Contribution towards operational

effectiveness was ranked as most important, which indicates that the organisation pursues business value from technology more than keeping abreast of the latest technology. Although not resource intensive was ranked as the least import, one can speculate that the case organisation pursues investment returns that capitalises on existing technology. Additional resources may imply investing in new skills, which may involve additional expenses.

Table 8-9: Ranking of innovative ICT adoption factors [p-value*/rank]

Perceived greater return on investment[0.4865/3rd]	Mean	Std-Dev
Strategic	3.3171	1.8633
Senior Manager	3.2258	1.8055
Line function	2.8851	1.8263
Operational	3.0123	1.7971
Extends internal stability and compatibility[0.3998/2nd]		
Strategic	2.9512	1.2440
Senior Manager	2.8736	1.3277
Line function	2.8736	1.3277
Operational	2.6790	1.3680
Low business functional complexity[0.7323/5th]		
Strategic	4.1220	1.3266
Senior Manager	4.0323	1.3425
Line function	3.8851	1.2798
Operational	4.0000	1.1900
Provides visible benefits[0.3098/4th]		
Strategic	3.0000	1.5652
Senior Manager	3.2742	1.4162
Line function	3.2184	1.4581
Operational	3.4630	1.4236
Contribution towards operational effectiveness[0.4304/1st]		
Strategic	2.5610	1.4841
Senior Manager	2.3065	1.2879
Line function	2.8736	1.7374
Operational	2.7160	1.6360
Not resource intensive[0.855/6th]		
Strategic	5.0488	1.4655
Senior Manager	5.4355	0.9516
Line function	5.2644	1.1254
Operational	5.1296	1.3882

The ranking of organisational ICT adoption factors is presented in Table 8-10. *Cost effective technologies* was ranked as most important followed by *positive user attitude,* which was ranked the second highest and showed significant differences in the group responses on the 5% level between *strategic* and *line* managers, and *strategic* and *operational* managers. One can speculate that the nature of their job function influences ICT adoption decisions, which is why line and operational managers understand first-hand

the importance of user support for the adoption of new technology. It is also indicative that lower level managers are acutely aware of the importance of having a user culture that supports technology adoption.

Table 8-10: Ranking of organisational ICT adoption factors [p-value*/rank]

Positive user attitude [0.0042*/2nd]	Mean	Std-Dev
Strategic	3.3171	1.5881
Senior Manager	2.6452	1.4269
Line function	2.6207	1.6652
Operational	2.3457	1.4883
Pairwise PostHoc Comparison	ZSTAT	SE
Strategic – Senior Manager	1.91	19.84
Strategic – Line function	2.49**	18.68
Strategic – Operational	3.55*	61.18
Senior Manager – Line function	0.52	16.39
Senior Manager – Operational	1.59	14.72
Line function – Operational	1.13	13.1
Cost effective technologies [0.1296/1st]	Mean	Std-Dev
Strategic	2.2439	1.3187
Senior Manager	2.4194	1.2486
Line function	2.3218	1.3425
Operational	2.6481	1.3986
Larger strategic investment budgets [0.1685/3rd]		
Strategic	3.4634	1.5508
Senior Manager	3.2097	1.5696
Line function	3.2529	1.3573
Operational	3.6173	1.4665
Information-intense business units [0.0702/4th]		
Strategic	3.2927	1.6918
Senior Manager	3.5323	1.5227
Line function	3.8046	1.4293
Operational	3.9506	1.3912
Policies that easily provide for the adoption of new technology [0.2526/5th]		
Strategic	3.6098	1.5792
Senior Manager	3.9839	1.5628
Line function	3.9770	1.4940
Operational	3.6235	1.6495
Technology savvy users [0.361/6th]		
Strategic	5.0732	1.2921
Senior Manager	5.2097	1.3199
Line function	5.0230	1.4465
Operational	4.8148	1.6083
* Significant difference on 0.05% level ** Significant difference on 0.01% level		

Discussion of findings

The primary objective of this paper was to identify the different levels of managers' ICT adoption views and determine their prioritisation of adoption factors that contribute towards

ICT adoption. Five ICT adoption factors were extracted by means of EFA and, as confirmed in literature, were identified as theoretical influences of ICT adoption. These were *decision drivers, decision inhibitors, organisational readiness, pace of innovation* and *established technology.*

Identified ICT adoption factors as viewed by managers

The essentiality of ICT systems for executing business functions is indisputable as shown by the high agreement across all managerial levels (93.18%) when asked if '*ICT systems are essential in accomplishing business functions within the organisation*'. Additionally, all managers consent to selecting technologies that cater for the organisation's strategic need (89.49% supported). One can speculate that managers consider the potential strategic and business value, which the technology may provide, prior to its adoption. This is a common trend amongst organisations, which pursue business value through technology adoption (Cohen *et al.*, 2002; Piva *et al.*, 2003; Gera & Gu, 2004).

The strong correlation of *decision drivers* with *organisational readiness, pace of innovation and established technology* is suggestive of managers' preference to pursue ICT adoption, which provides perceived benefits, compatibility with current technologies and greater user awareness. The strong positive correlation between *decision drivers* and *decision inhibitors* is suggestive that in certain circumstances, regardless of the need for ICT adoption, managers may not be supportive of its adoption. This finding may be unique to this case organisation and may be attributed to the organisation's nature of business, uncertainty regarding business benefits or complexity associated with the technology. *Decision drivers* were viewed as more relevant when managers perceive that individuals make decisions compared to when they think there is collaborative decision-making. An analysis of the data indicates that *decision inhibitors* encourage managers to avoid the adoption of ICT when it does not demonstrate visible relative advantage, business benefits or strong market presence. The common view shared by all managers on items in *decision inhibitors* may be suggestive of the case organisation's culture. The correlation between *decision inhibitors* and *pace of innovation* suggests that although management is aware of the advancement in technology, managers' individual exposure towards technology influences their decisions regarding its adoption. Management is cognisant of disruptive

technologies and its influence on *established technology;* however, preference is given to stability and compatibility with internal infrastructure.

Managers with higher levels of education considered *organisational readiness* for ICT adoption as less important than the views of lower qualified managers. One can speculate that from a strategic management point of view, this may not be an issue because irrespective of the user's attitude towards the technology, executive decisions are taken in favour of adopting the technology. This may be applicable to ICT adoption, which is of strategic importance to the case organisation. Although items in *pace of innovation* influence demands on management, the data indicates that this factor did not greatly influence the case organisation's decisions to adopt ICT. The rapid pace of technological innovation usually means major changes over the previous technology (Agarwal & Prasad, 1998:16), which may be the reason why management is not keen to introduce new technologies into the organisation. Managers (75.28%) were of the opinion that executive management was able to influence ICT adoption decisions, which affected *established technologies* more than individuals could. The strategic nature of these decisions may introduce radical change to the organisation, and may require large investments, which is why executive involvement may be required.

Managers' priorities of general ICT adoption factors
An analysis of the ranking of *general* ICT adoption factors indicate that managers across all levels prioritise adoption of technology that promises returns on business benefits. Higher priorities for operational efficiencies by lower management levels are suggestive that this may be a result of demands placed on managers as a result of job context, and that a gap may exist with strategic managers in understanding the requirements of their business users. One can further speculate from the significant difference in responses from strategic and lower level managers that a divide exists between upper and lower level managers in communicating the strategic objectives of the case organisation and how these objectives are operationalised.

Managers' priorities of external ICT adoption factors
A common view shared by all levels of managers on their priorities of *external* adoption factors indicates that external influence does not affect managers' priorities for technology

adoption. Managers on all levels concur that preference is given to stability and compatibility with existing technology, thus integration with the new technology is a key factor in prioritising for ICT adoption. However, this preference was mostly prominent in middle and lower management domains and may be the result of their operational focus. One can speculate that where technology is seen to address a strategic gap, strategic managers may introduce new technology to existing core technologies without considering already established technologies.

Managers' priorities of innovative ICT adoption factors

Managers' priorities lie with technology that provides operational efficiencies more than keeping abreast of the latest technology. This is supportive of the type of case organisation as it is not technology driven. One can speculate that although the managers rely on technology to address their business requirements, technology does not form part of the case organisation's core competencies.

Managers' priorities of organisational ICT adoption factors

Managers' priorities of *organisational* ICT adoption factors indicate that the nature of management's job functions influences ICT adoption decisions, where line and operational managers understand first-hand the importance of user support for the adoption of new technology. Ramifications associated with users not supportive of new technology may directly affect line and operational managers' more than strategic managers. The finding is suggestive that user behaviour sets the tone for organisational culture, and dictates that it is imperative for strategic management to understand the needs of its business users for the successful realisation of organisational objectives.

Table 8-11 indicates the most important priority as ranked by each manager within different adoption categories. It is evident that strategic managers in the case organisation have different priorities for ICT adoption from lower level managers. One can speculate that job context contributes significantly towards this difference. The similar views shared by *senior*, *line* and *operational* managers may be suggestive that overlapping functional roles exist.

Table 8-11: Managers' No. 1 priority of ICT adoption factors

	General	External	Innovation	Organisational
Strategic	Strategic value	ICT compatibility	Operational effectiveness	Cost effective
Senior	Operational effectiveness	ICT stability	Operational effectiveness	Cost effective
Line	Operational effectiveness	ICT stability	Stability and compatibility	Cost effective
Operational	Operational effectiveness	ICT stability	Stability and compatibility	User attitude

Overall, an analysis of the five factors and ranking thereof provide strong evidence as statistically significant predictors of ICT adoption and provide strong support for P_2 stating that *job function contributes towards ICT adoption decisions.* However, the findings are inconclusive to provide sufficient support for P_3 stating that *pace of innovation influences management to adopt innovative technology sooner.* In the case of P_1, which states that *different levels of management rank ICT adoption factors the same,* empirical analysis of the data suggests that different levels of management rank adoption factors differently and is therefore not supported.

Sense-making from an s-as-p perspective

The practitioners in the paper refer to the managers across different job levels within the case organisation. Although the study focuses primarily on aggregating the collective responses per level to determine the group's views on ICT adoption priorities, where there were significant differences in responses pairwise comparisons were done. Collective management responses measured for the various levels indicate that managerial praxis for ICT adoption is driven by organisational efficiencies. Lower level managers believe that they are able to contribute towards ICT adoption decisions better than higher-level managers could. One can speculate that this is a result of their close understanding of their localised work activity, which addresses organisational efficiencies. Collectively managers agree that executive managers are responsible for decisions that concern changes to internal compatibility and stability of technical infrastructure. One can further speculate that although these decisions may affect all levels of management, these decisions involve the strategic nature of the organisation and require executive authority. Since this is a common collective view one can interpret this as part of organisational practices stemming from repeated actions. The support for repetitive and unchanging structures through shared reasoning can be regarded as 'groupthink'. The challenge with this rationality is that repeated practice is a problem in strategic management as even in

moderately dynamic environments; differentiation and change are important aspects for competitive advantage (Jarzabkowski, 2004:534).

The responses indicate that the views on the priorities of 'organisational' factors for ICT adoption differ among the strategic and lower level managers. These views may be purposive and sensible in view of complex work actions. It is easy to speculate that this is a result of manager's job context and that the collective thinking for senior managers differs from lower level managers because of the strategic responsibility associated with their decisions. Table 8-11 indicates the different priorities of the managers. It is evident from the case study that the views of line and senior managers are similar. One can surmise that this view stems from redundant work practices. However further investigation need to be taken to determine the extent to which this is true. Analysis of the data indicates that the technology department has more lower level managers that are in possession of specialised qualifications. One can conjecture that technology is a specialised field and requires specialised skills; as such, their work actions are driven by technical actions. Individuals with specialised skills may be responsible for 'filtering' decisions to senior managers in terms of their localised praxis.

A collective view is shared among all managers regarding the priorities associated with 'innovation' and 'external' factors. Analysis of the responses indicates that this could result from an organisational culture that is supportive of common practices. Since all managers agree that adoption factors for 'innovation' drives operational efficiencies, one can speculate that internal organisational praxis is driven by sound policies and processes associated with ICT adoption decisions. The challenges associated with this view are that internal practices may be rooted in past adoption patterns that may no longer be valid in the current context of doing business. Relying on established practices, although may prove sound and rational, could result in poor decisions, Organisations need to regularly visit their practices to determine the relevance in the modern business context (Stensaker & Falkenberg, 2007:140).

Management implications

This study provides insight into understanding the factors that influence managements' thinking on ICT adoption at an individual level and aggregates the collective views of adoption priorities according to job levels. The findings indicate a difference in the views of prioritising for ICT adoption amongst management levels, which may influence the manner in which strategic decision-making for ICT adoption occurs. It is evident that strategy-making can no longer be confined to the upper echelons of organisations but should involve input from all management levels. Strategic and executive management needs to pay close attention to internal aspects that may influence organisational decisions when developing strategies. Strong emphasis is on strategies that need to be agile to accommodate market-pull factors. The key practical implication is that job function through dynamic work activity influences managers' priorities for ICT adoption. The findings are also suggestive that duplicate or overlapping functional roles may exist, which may be a result of evolving changes in functional roles experienced within the case organisation's structures. Due to the disparate nature of organisational focus between strategic and lower level managers, organisation's strategies need to be clearly communicated to all levels of management for successful alignment with strategic and operational decisions. Strategic management needs to solicit the involvement from lower operational managers as it is evident from the findings that they are able to contribute valuably towards strategic decision-making.

The findings are suggestive that users' attitudes are critical for the success of ICT adoption and may set the tone for organisational culture, which is why it becomes imperative that their requirements be considered for strategic decisions. Finally, it is imperative that managers realise that although organisational requirements take priority when deciding to adopt technology, external forces may be disruptive if not monitored appropriately.

Conclusion

The aim of this paper is to examine the micro-activities of practitioners', their praxis and practices to understand the priorities placed on ICT adoption factors by different levels of management. The outputs provide a strong overall validation and confirm the importance

of ICT adoption factors as an influence on the different levels of managers' ICT adoption views on prioritisation for ICT adoption. This study not only confirmed the importance of ICT adoption factors as supported by previous studies (Lee, 2004; Russell & Hoag, 2004; Latham, 2011) but also added the role and influence of job function and level of education as contributors towards the prioritisation for ICT adoption. In unpacking the micro-activities of various management levels, practical insight was provided into their praxis and practices. This insight led to an improved understanding of their workings and the influence this has on their thinking for adopting technology. Additionally, by focusing on the practice perspective, it was possible to examine some of the recurrent doings of managers and expose how they are both; shaped by and shape structural conditions and consequences. Hence, the study achieved its intended goal of an improved understanding of the factors that contribute towards ICT adoption and the priorities placed on them, as viewed by management.

Limitation and suggestions for future research

It is worth noting that this study has some limitations. Firstly, the study was subjected to participant bias, as is the nature with questionnaires (Saunders *et al.*, 2009:110). Even though attempts were made in the questionnaire to eliminate bias were possible, this was inevitable. Secondly, this study focused on a single case and focused on aggregate manager's response per job level to determine ICT adoption priorities. Further research is required to determine if support for these findings is repeatable in other organisations. Additional research needs to be conducted to determine if the pace of innovation influences management to adopt technology sooner. It was evident from the findings that a gap exists between the strategic and operational levels, thus further research needs to be undertaken to better understand how strategic objectives can be aligned with flexible strategies that address operational business requirements. Finally, there is a high correlation amongst the five factors and the results of the findings should be evaluated in light of this.

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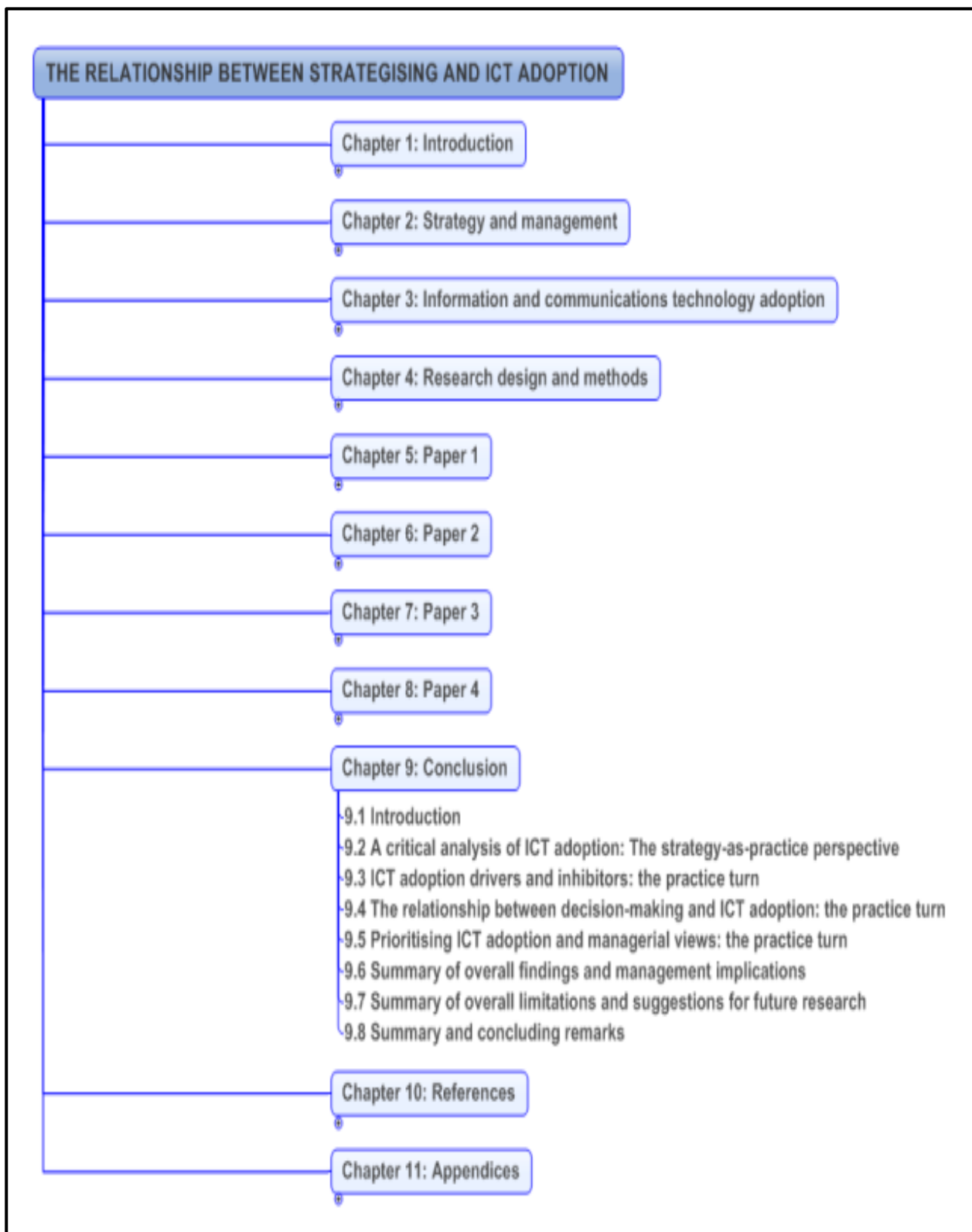
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9 DISCUSSION AND CONCLUSION

THE RELATIONSHIP BETWEEN STRATEGISING AND ICT ADOPTION

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- Chapter 4: Research design and methods
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9.1 INTRODUCTION

Literature indicates that instability and uncertainties in the modern economy are a direct result of globalisation, technological innovation and changing social trends. The pace of change is quickening and coupled with market uncertainties, organisation's strategists are challenged by increased business complexity. Information and communications technology (ICT) is amongst the largest contributor to these dynamic forces and is the reason for much of the unpredictability experienced in the market environment. In the last decade, ICT has gained strategic prominence and is revolutionising the ICT and business landscape through the rapid pace of innovative ICT products. The continuous evolution of ICT has permeated the daily operations of organisations and continues to influence the way business is done globally. As an ostensible choice, managers are relying on ICT to engender strategic advantage through the adoption of innovative products and to reduce the gap that may exist between the organisation and its environment. However, it is apparent to organisations that given the current market challenges, the traditional models for strategy and strategy-making are ineffective in meeting these challenges. Strategy-as-practice (s-as-p) is ideally suited to unravel the dynamics of strategy-making in the modern context, as it focuses on the micro-activities of strategy. Hence, s-as-p served as a framework for this study.

This study's fundamental research problem was to:

Understand how strategising for ICT adoption happens in practice.

The introductory chapter stated the main facets of this study as *strategy*, *strategic management*, *management* and *ICT adoption*. The research of these critical concepts was discussed in Chapters 2 and 3 of this study. Chapter 4 described the research methodology used to answer this study's research questions. This study attempted to unravel the research problem by answering relevant questions that related to the research problem. By using the building blocks of s-as-p as a lens, the ICT adoption factors were examined in the context of strategising for ICT adoption. The research problem was categorised into four significant focus areas, which became the cornerstone of the four papers written on this study, namely:

1. A critical analysis of ICT adoption: the strategy-as-practice perspective (Chapter 5).
   - Focus: development of an ICT adoption framework.
2. ICT adoption drivers and inhibitors: the practice turn (Chapter 6).
   - Focus: measure the relevance of the ICT adoption framework against the case study's ICT adoption factors.
3. The relationship between decision-making and ICT adoption: the practice turn (Chapter 7).
   - Focus: decision-making for ICT adoption.
4. Prioritising ICT adoption and managerial views: the practice turn (Chapter 8)
   - Focus: managerial views on ICT adoption.

The focus area of each paper as identified above, contributed towards answering the study's research questions as highlighted in Table 1-1 and the sub-questions as presented in 1.5 of this study.

This section of the study summarises and concludes its findings based on the four identified focus areas that constituted the basis of this study.

9.2 A CRITICAL ANALYSIS OF ICT ADOPTION: THE STRATEGY-AS-PRACTICE PERSPECTIVE

This was the first paper of the four papers that addresses key issues relating to the research problem identified in this study. The key focus of this paper was to analyse critically the aspects of ICT adoption and to present a comprehensive framework of ICT adoption factors. Drawing from the micro-lens of strategy-as-practice the paper examined these factors to gain insight into the activities of strategising for ICT adoption.

Paper overview

Advancements in ICT have followed the trend predicted by Gordon Moore in 1965 in that ICT is following a cheaper, more powerful and increased integration into operational aspects of everyday tasks. This trend is profoundly influencing the manner in which

organisations work, collaborate, communicate, interact, learn and socialise, and hence strategically alters organisations' game plans. It is abundantly clear from extant research that traditional approaches to strategy formulation are inadequate to address the challenges in the modern business environment. Research indicated that organisations need to adopt an approach to strategy formulation that can embrace the current environmental instabilities, while being agile and flexible in response to adaptive business needs. Strategy-as-practice (s-as-p) provides a unique manner in understanding strategic management, managerial activities and decision-making. It focuses on the micro-level *social activities*, *processes* and *practices* that characterise organisational strategy and strategising (Golsorkhi *et al.*, 2010:1). By drawing from the s-as-p perspective, ICT adoption activities can provide insight into adoption practices, more importantly it can provide the basis for future reference in determining how ICT adoption factors influence ICT adoption decisions and how these decisions ultimately shape strategy.

Managers are in a precarious position in that they are relying on ICT adoption as a means to close the gap that may exist between the organisation and its environment, while at the same time making use of ICT as a catalyst for strategic change within the organisation. Technology adoption influences all aspects of organisational activity and this trend is guaranteed to continue. In addition to the advocacy needed to adopt the appropriate technology, managers need to have a sound understanding and awareness of the factors that influence ICT adoption. Adopting the wrong technology can have a catastrophic influence on the organisation. In not keeping up with technology innovations, organisations can experience equally negative influence. This is evident from the demise of those brick and mortar organisations that refused to adapt their organisational strategies to align with the evolving business landscape. The challenge facing managers is how to strike a balance between when to adopt technology and for what strategic purpose.

In order for managers to take effective decisions they need to be empowered with the appropriate knowledge and an organisational structure that is supportive of decentralised decision-making. Complicated organisational structures add to the delay in taking appropriate decisions where ICT adoption is concerned. The rate and speed of ICT adoption can make a huge difference in deciding when to adopt the technology. It is clear from research that in order for organisations to maximise the benefit of pursued advantage

through technology innovation, early adoption of the technology is ideal. An organisational culture that is supportive of ICT adoption as a means to address strategic, tactical and operational benefits makes the decision to adopt ICT easier.

Paper outcomes

The findings made visible the complexities of strategy formulation in the modern business context. Additionally, it reported on collectively published articles relating to ICT adoption. Factors that contributed towards ICT adoption in the current business context were categorised into three critical factors, namely external, innovation and organisational. This information was then used to develop a framework of the factors that influenced ICT adoption. These three factors were selected based on their common recurrence associated with literature articles on ICT adoption and as an appropriate construct for the characteristics of the attributes associated with the factor. These factors were seen as drivers or barriers to ICT adoption depending on the context of whether the practitioners decide to adopt the technology sooner or delay the adoption of technology. The value of developing the framework was that many of the ICT adoption characteristics were not previously brought together into context for academic studies on ICT adoption.

Drawing from the s-as-p perspective, these factors were then analysed against the context of ICT adoption. ICT adoption can be viewed from the activity lens as a dual sense of practice in social theory; firstly as something that is used to guide activity and secondly as the activity itself. In the context of 'guiding activity', When viewed from the s-as-p lens, ICT adoption in the context of this study related to associated practices involved in decision-making and shaping managerial views on ICT adoption. In terms of the 'activity itself', ICT adoption is associated to actions that are taken to accomplish the actual work of ICT adoption for example setting up of work-shops, drawing up of budgets, making presentations on ICT adoption and the like. The framework presented in Figure 1-1 highlighted this view.

9.3 ICT ADOPTION DRIVERS AND INHIBITORS: THE PRACTICE TURN

This was the second paper of the four papers presented in this research study. Given the significance of technology adoption to align business strategies with environmental forces, the critical focus of this paper was to determine the relevance of the ICT adoption factors against the identified framework and to expose the critical ICT adoption drivers and inhibitors that were specific to the case organisation. Additionally, the paper examined the items within the identified categories of adoption factors from the practice perspective to garner insight into the activities of ICT adoption. By making use of the s-as-p perspective, ICT adoption formed the context in which the adoption factors were analysed.

Paper overview

ICT innovation is a critical contributor to environmental instability and is identified through innovations of 'disruptive' technologies that render organisation's existing technologies obsolete (Danneels, 2004:248). In view of this, executives, strategists and managers are focusing their attention on ICT adoption for opportunities in competitive advantage and to close the strategic gap that exist between the organisation and its environment. As such, strategic planning for ICT requirements has become essential to support the organisation's objectives in response to market competition. Strategic ICT requirements, together with external market influences form the critical drivers and inhibitors to ICT adoption. Against this context, identifying drivers and inhibitors to ICT adoption become critical, as identifying the incorrect adoption factors can negatively influence the sustainability of the organisation.

S-as-p consists of three building blocks that embody strategising, namely the practitioners, practices and praxis. Practitioners are the 'workers', practices are the 'tools' and praxis is the 'work' of strategy (Whittington, 2002:c1). In periods of extreme instability cognitive frames becomes central to strategising, as actors attempt to make sense of the uncertainties experienced in the business environment (Kaplan, 2008: 731). The practice perspective postulates that it is through the constant and repeated nature of day-to-day activities that structural outcomes are generated and become either reinforced or changed over time (Golsorkhi *et al.*, 2010:24). In the context of ICT adoption, a simple task like

drawing up of budgets can contribute immensely towards realising competitive advantage, as it drives adoption decisions pertaining to the amount of capital to invest or the type of technology to adopt. What people do is tightly connected to what they know similarly, establishing IT capabilities in an organisation are realised through the manner in which individuals communicate and generate new ideas.

ICT adoptions are subjected to a combination of push and pull influences. Organisations prefer ICT adoption that are compatible with internally established stable technologies to leverage off existing investments, unless they intend to capitalise on emerging technologies by pursuing strategic advantage (Khanagha *et al.*, 2013:53). When adopting technology, management decisions are further influenced by the rate and speed of adoption. The relationship between skilled workers and the early adoption of ICT may be directly linked to job context because technology-centric organisations demand greater adoption of technology, which in turn requires highly skilled workers.

Information obtained from extant literature on ICT adoption was categorised into three significant factors namely *external*, *innovation* and *organisational*, which formed the ICT adoption framework used in this study. Chapter 3 unpacked these three ICT adoption factors in detail and presented the characteristics of each factor. Figure 9-1 indicates the three critical factors of ICT adoption. Adoption factors can be a combination of positive influences that are referred as drivers or negative influences commonly referred to as inhibitors.

Figure 9-1: Factors influencing ICT adoption
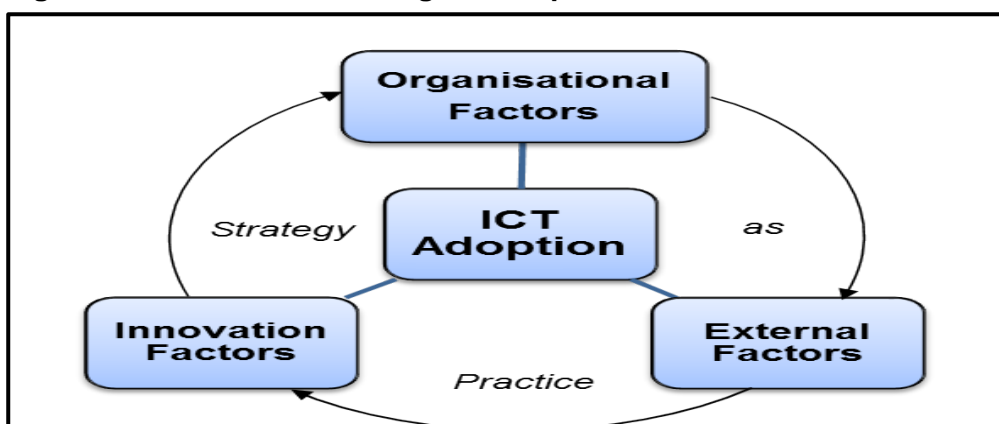
Source: Own compilation.

ICT drivers refer to the resource, process or condition that is essential for the sustained success and progress of an organisation. ICT drivers in essence are the key motives for decision-makers to adopt the technology and are the positive forces that provide decision-makers with the impetus to adopt the technology. ICT drivers may be a combination of one or more characteristics from the three ICT adoption factors, namely external, innovation and organisational. Drivers of ICT adoption are associated with positive aspects that support the adoption of the technology, such as organisational culture, perceived advantage of the technology, compatibility with existing technology and features of the technology that are perceived to provide the organisation with strategic, tactical and operational gains.

ICT inhibitors refer to barriers that prevent decision-makers from adopting the technology. These 'negative aspects' delay or prohibit the adoption of the technology and include aspects such as complexity of the technology, investment intensive, resource intensive, poor vendor support or lack of organisational support. ICT inhibitors may be a combination of one or more characteristics from the three ICT adoption factors, namely external, innovation and organisational. Ultimately, the degree to which an organisation is responsive to new technology determines its tendency to adopt the technology.

Paper outcomes

The adoption factors identified from the case organisation provide for strong relevance to the adoption framework. Twenty-six of the 30 items loaded successfully and all items within the factors were easily classified into one of the three adoption factors of the ICT adoption framework. The constructs as identified by the case organisation indicated that the items represented one or more of the adoption factors, which indicated that the constructs may influence one or more disciplines of the organisation.

This study's empirical findings indicated that aspects of decision drivers supported the existence of a strong market acceptance for the technology prior to the organisation's adoption of the technology. Decision drivers had a strong correlation with organisational readiness, pace of innovation and established technology. Findings further indicated that decision drivers enabled organisational readiness towards improved decision-making for

ICT adoption. Pace of innovation, although influenced by decision drivers, did not contribute greatly towards the factor variance. This may be specific to the case organisation and indicated that the organisation does not aggressively pursue the adoption of technology as a means of strategic advantage. Although the study does indicate that ICT drivers contributed towards the decisions on whether to adopt the technology, it is inconclusive on determining whether ICT drivers supported the adoption of new technology sooner.

Findings for decision inhibitors are suggestive that decision-makers avoid the adoption of technology when the technology does not demonstrate visible advantages. A strong correlation between decision inhibitors and organisational readiness exists, which was supportive of an organisation that pursues the adoption of technology where business value is of prime importance. This was further suggestive that the organisational policies, structures and culture are unfavourable towards the adoption of technology that contributed poorly towards operational efficiencies or strategic business value. Interestingly, all respondents shared similar views on aspects concerning decision inhibitors, which indicated that a collective view exists and may be indicative of the organisational culture concerning decisions around technology adoption.

Insight into the items of adoption factors indicated that strategising activities for ICT adoption within the case organisation are to a large extent governed by internal structural and operational aspects. This is supported by the respondents perception of 'top management involvement', 'availability of internal resources and knowledge' and aspects associated with 'business benefit'. Thus, one can reason that activities of ICT adoption have a primary focus on internal business benefits. Given the context one can further conjecture that ICT adoption within the case organisation serves as a supportive role to business operations and not instrumental in achieving competitive advantage.

9.4 THE RELATIONSHIP BETWEEN DECISION-MAKING AND ICT ADOPTION: THE PRACTICE TURN

This was the third paper of the four papers presented in this study. The key emphasis of this paper was to examine how strategising for ICT adoption happened in practice with particular reference to decision-making activities. The aim of this paper was to probe the micro-activities of practitioners, their praxis and practices to gain a better understanding of the decision-making styles and processes that culminated into the adoption of ICT.

Paper overview

S-as-p provides a unique context in understanding the micro-level 'social activities', 'processes' and 'practices' that characterise organisational strategy and strategising (Golsorkhi *et al.*, 2010:1), as it provides a comprehensive, in-depth analysis of unpacking the decision-making activities of strategising for ICT adoption. Decision-making for ICT adoption is not always straight-forward as there are external influences to consider. Thus, the advantage of using this approach to understand strategising for ICT adoption was that it provided an opportunity to analyse how micro-level activities of ICT adoption contributed towards the wider organisational practices.

Managers are involved in a variety of decision-making activities that may be of strategic importance. Issues may become apparent from the operational context of managers' daily tasks and may contribute towards the organisation's strategic objectives. It is undeniable that given the modern challenges facing management, executives rely on middle and operational managers' advice for mapping the future direction of the organisation. Literature indicates that in the modern context of strategy formulation, strategists rely on social interactions, complementary collaborations, intuition and informal discussions for information on developing agile organisational strategies.

Amongst others, the managerial activities of strategising include analysis of data, workshops, meetings, making presentations, strategy committees, and preparing formal documents – activities that must not be taken lightly (Whittington, 2003:117; Hodgkinson *et al.*, 2006:479). By leveraging from the s-as-p lens, aggregate actors can be examined to

determine how they construct localised micro-levels of strategy praxis through actions like decision-making. Through the collaboration of the group's knowledge, experience and past practices in similar context, decision-making can shape the outcome of ICT adoption. The practice theory posits that individual behaviour is embedded within social practices and praxis relies on practices (Vaara & Whittington, 2012:4). Thus, by uncovering the aggregate practitioner's view of ICT adoption factors one can expose the influence these factors have on practitioner's praxis.

Paper outcomes

This study's empirical findings on managers' approach to decision-making indicated that a formal approach was favoured amongst senior and executive managers, whereas line and operational managers preferred a more informal style. This approach to decision-making may be indicative of the case organisation or may be suggestive that the organisation is adoptive of traditional methods to strategy formulation. However, evidence exists that the lower levels of management are adopting a more informal approach. This could be suggestive that this preference to decision-making may be in response to their client's requirements and improved service delivery.

It was irrefutable that respondents agreed that ICT is necessary in executing business functions. An analysis of the various items within the five constructs indicated that organisational factors did indeed relate to ICT adoption. Factor items such as availability of resources, availability of knowledge, management support, user satisfaction, compatibility and stability with existing technology, business benefit and organisational policies were some of the items that were rated high amongst respondents when deciding to adopt ICT. Empirical findings of this study indicated that level of education was related to decision-making for ICT adoption. Literature indicates that education plays a significant role in decisions on whether to adopt technology sooner. However, in the case organisation the empirical findings indicate that higher levels of education did not significantly influence the decision to adopt ICT. It is important to note that this may be unique to the case organisation, as a higher number of respondents were from the ICT department and were in a position of skilled qualifications rather than postgraduate degrees.

Data analysis of the various praxis and practices performed by the individuals provided strong empirical support to indicate that decision-making for ICT adoption occurred at various levels within the organisation. Literature indicates that this approach to decision-making is critical to the formulation of agile strategies, given the challenges experienced by managers in the modern business context. Individuals perceived that they were able to contribute towards decision-making more than through collaboration, which could be the influence of their job context and the ICT priorities set by individual managers on the types of decisions taken. Adoption factors for drivers and inhibitors within the case organisation could be suggestive of past practices, which indicate a risk averse attitude towards ICT adoption. One can reason that this is a result of the type of industry that favours tried and tested approaches to adoption over 'bleeding edge' technology. The aggregate actors' response indicated that practices of decision-making styles are in favour of formal approaches. One can speculate from this that the case organisation employs a traditional approach to strategy-making, although there was evidence that 'new' thinking is being integrated into organisational activities. This was evident by the introduction of an informal approach to decision-making at lower levels.

9.5 PRIORITISING ICT ADOPTION AND MANAGERIAL VIEWS: THE PRACTICE TURN

This was the final paper of the four papers presented in this study. This paper identified the ICT adoption priorities and the managerial views thereof. The aim of this paper was to examine the micro-activities of practitioners', their praxis and practices to understand the priorities placed on ICT adoption factors by different levels of management.

Paper overview

There is no doubt that the pace of ICT innovation and the adoption thereof has had a profound effect on the manner in which managers operate. This ultimately influences the approach taken by managers in conducting business activities. Managerial views on ICT adoption coupled with job context, managerial praxis and past exposure to technology adoption creates a unique perspective for each manager, which can influence his or her

thinking on ICT adoption. By aggregating the collective views of managers on the same job levels, comparisons are made among managers on different job levels. The outcomes of which provide insight into managers' praxis and their views on ICT adoption factors.

The arrival of the Internet has enabled customers both internal and external to the organisation to be more knowledgeable, informed and empowered. Thus, customers are demanding a greater say and involvement in their products and services. The challenges facing managers are to deliver personalisation of products and services, better adaption, greater customisation and increased value at faster response times. Managers are looking to ICT adoption as a possible solution to address these requirements. Given that managers may view issues differently based on their understanding and priorities of their job context, it makes sense that job context may influence managers' prioritisation of ICT adoption factors.

In the organisational context of work activities, although managers may perform similar activities, they may conceptualise the activities differently. This is attributed to the significance the individual places on the interpretation and purpose of the activity, which stems from their past exposure and cultural understanding (Golsorkhi *et al.*, 2010:134). By examining collective management behaviour and their views towards ICT adoption, insight can be obtained into understanding the priorities placed on adoption factors that ultimately shape decisions. Collective thinking that produces similar rational may be purposive to accomplish complex tasks. Over time, these actions may make sense to decision-makers and may be repeated until they become common practices within the organisation. Therefore, it becomes important to understand the different views in the context of ICT adoption, to determine the influence this may have on shaping strategic outcomes.

Paper outcomes

The findings indicate that a higher drive for operational efficiencies amongst lower levels of management exists when prioritising for ICT adoption. This had a direct relationship with their job function, which may be driven by operational efficiencies. One can reason that the findings are indicative of a traditional approach to decision-making whereby senior management are primarily focused on the strategic direction of the organisation and hence

the formulation of strategies, while the lower levels are more focused on implementing those strategies. Although lower level managers prioritise ICT adoption factors that are consistent with compatibility and stability with internal technology, it was evident that strategic level management were able to introduce new technology that was seen to address strategic gaps.

The findings of the study clearly indicated that the level of management influenced priorities placed on ICT adoption factors. It was further evident that the priorities placed on ICT adoption factors by the different levels of management was as a result of a direct influence of their job context. A common view shared by all levels of managers was that the organisation pursues the adoption of technology that promises returns on business benefit and not necessarily influenced by the pace of innovation. The findings of strategy formulation for the case organisation indicated that the approach was not fully traditional (deliberate), as there is an indication of progression towards a more agile (emerging) style.

Collective management responses as per the various levels indicated that managerial praxis for ICT adoption was driven by organisational efficiencies. Lower level managers believed that they are able to contribute towards ICT adoption decisions better than higher-level managers could. One can reason that this was a result of their close understanding of their localised work activity, which addressed organisational efficiencies. Collectively managers agreed that executive managers were responsible for decisions concerning changes to internal compatibility and stability of technical infrastructure. Since this was a common collective view, one could interpret this as part of the organisational practices stemming from repeated actions. The support for repetitive and unchanging structures through shared reasoning can be regarded as 'groupthink'. The challenge with this rationality is that repeated practice is a problem in strategic management as even in moderately dynamic environments; differentiation and change are important aspects for competitive advantage (Jarzabkowski, 2004:534).

The responses indicated that the views on priorities of 'organisational' factors for ICT adoption differed among the strategic and lower level managers. These views may be purposive and sensible in view of complex work actions. It was easy to reason that this resulted from the manager's job context and that the collective thinking for senior

managers differed from lower level managers because of the strategic responsibility associated with their decisions. A collective view was shared among all managers regarding the priorities associated with 'innovation' and 'external' factors. Analysis of the responses indicated that this could result from an organisational culture that is supportive of common practices. Since all managers agreed that adoption factors for 'innovation' drives operational efficiencies, one could speculate that internal organisational praxis was driven by sound policies and processes associated with ICT adoption decisions. The challenges associated with this view may be that internal practices may be rooted in past adoption patterns that may no longer be valid in the current context of doing business. Relying on established practices, although may prove sound and rational, could result in poor decisions, Organisations need to regularly visit their practices to determine the relevance in the modern business context (Stensaker & Falkenberg, 2007:140).

9.6   SUMMARY OF OVERALL FINDINGS AND MANAGEMENT IMPLICATIONS

The key objective of the research was to address this study's research problem, namely to *understand how strategising for ICT adoption happens in practice.* In doing so, the study recognised critical focus areas and identified questions relating to these focus areas. The focus areas were researched and reported as four independent but interrelated papers. The collective findings and managerial implications as identified by the four papers of this research study are as follows:

- Strategising activities are evolving from the deliberate top down executive strategy formulation approach to include lower level managers. This was evident in the branching of decision-making styles towards more informal discourses. This could have serious implications for organisational structures, managerial roles and responsibilities. It was evident from the findings that 'line' and 'senior' managers shared the same priorities for ICT adoption factors. This could be in response to cater for faster agile reactions to the business environment. Irrespective, managers need to be empowered to make the necessary decisions relating to their praxis.

- In the case organisation strategising for ICT adoption could be seen as the activity of choosing technology by selectively incorporating organisation's practices and contextual influences and with the use of specialised tools, help make sound decisions. The use of ICT is critical to the economic survival and bottom-line of organisations. Although technology was important in shaping strategic outcomes for the case organisation, decisions on what technology to adopt remains the prerogative of organisations, as governed by the relevant adoption factors.

- Adoption factors coupled with knowledge about specific types of technology, industry successes and failures relating to technology adoption and reputational view about the technology contributed towards establishing patterns relating to technology products. This pattern over time becomes practices that practitioners look to for guidance, which influences strategising activities for ICT adoption. However, differentiation and change in the use of technology become critical to achieve competitive advantage, recursive practices then presents a challenge to strategic management if practitioners are largely reliant on past practices. Thus, it becomes imperative that social practices embedded in case organisation needs to evolve and have adaptive characteristics that can appropriately influence ICT adoption.

- *Decision drivers* were viewed as more relevant when respondents perceive that individuals made decisions, compared to when they think there was a collaborative approach to decision-making. Managers and decision-makers for ICT adoption need to pay particular attention to individuals involved in specialised localised praxis, as they are able to provide valuable insight that could shape the outcome of decision-making.

- Organisational culture may stem from routine organisational practices, and may inform the manner in which praxis are conducted. The findings indicated that the case organisation is reliant on strong cultural practices that could negatively influence 'group think'. The drawback of this was that although the collective decision-making may stem from sensible and rational responses, they may be based on out-dated practices.

- The findings indicated that job context and levels of education influence decision-making. Managers and decision-makers need to consider input from all levels of the organisation to ensure that the correct information was considered when adopting technology. Even managers at lower levels were able to contribute towards decision-making as their activities were localised to a specific job context.

- Adoption factors were instrumental in strategising decisions for ICT adoption. However, these factors need to be considered in context of the business needs, strategic objectives and organisational efficiencies, which the technology will address.

- Managerial views and priorities arise from job context, past practices, organisational processes and experience associated with the technology. Thus, different levels of managers viewed adoption decisions differently. It is imperative that the context of the technology adoption is made clear upfront. Failing to contextualise adoption decisions are likely to result in adopting the wrong technology.

Insight into the responses of adoption factors items indicated that strategising activities for ICT adoption within the case organisation are to a large extent governed by internal structural and operational aspects. This was supported by the respondents perception of 'top management involvement', 'availability of internal resources and knowledge' and aspects associated with 'business benefit'. Thus, one can speculate that activities of ICT adoption in the case organisation have a primary focus on internal business benefits. Given the context one can further conjecture that ICT adoption serves as a supportive role to business operations and not instrumental in achieving competitive advantage. In view of this, strategising activities associated with ICT adoption was largely driven by internal organisational and functional requirements.

9.7 SUMMARY OF OVERALL LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

This section highlights the limitations and suggestions for future research as identified by the four papers of this study, which are as follows:

- This study made use of a case study as the strategy of inquiry. This was done purposefully with the intention of understanding the practical implications of strategising for ICT adoption within the case organisation. The study was able to expose some of the aggregate activities involved in strategising for ICT adoption. Although the study successfully highlighted some activities involved in strategising for ICT adoption, the specifics of how these activities are performed are still unclear. Further research need to be conducted to provide insight into this.

- Although the ICT adoption framework was developed from extensive research on ICT adoption and adoption factors, it was evident from research that these factors are to a large extent based on the seminal works of Rodgers and Davis studies on diffusion and adoption theory respectively. Further research needs to be done to determine the relevance of these theories in the contemporary context of ICT innovation.

- Given that ICT has become a dominant influence on establishing strategic objectives, further research needs to be conducted to determine the value of ICT adoption towards addressing strategic and operational requirements. This insight can enable practitioners to appreciate and understand the organisational value of their decisions.

- Although the study indicated that ICT drivers were able to contribute towards ICT adoption decisions, it was inconclusive in determining whether the ICT drivers supported the adoption of technology sooner and therefore further investigation needs to be undertaken in this area.

- Although it was not the intention of this study to generalise the findings, it was possible to do so for contextually similar organisations, the extent to which this is possible needs to be explored further. Additionally, further research is required to determine if support for these findings is repeatable in other organisations.

- It was evident from the findings that a gap existed between the strategic and operational levels, thus further research needs to be undertaken to better understand

how strategic objectives can be aligned with flexible strategies that address operational business requirements.

9.8   SUMMARY AND CONCLUDING REMARKS

This study confirmed the importance of strategic management and touched on the critical challenges facing managers in the contemporary context. The findings reiterated the importance of strategy and ICT as a variable in strategic management, with particular reference to the pace of innovation and its influence on organisations. ICT adoption is a process that realises the innovation of technology, and became the cornerstone of this study with particular reference to strategising activities for ICT adoption. Thus, the purpose of this study was achieved when exploring the activities of strategising in the context of ICT adoption. In doing so, the study developed an ICT adoption framework and by drawing from the building blocks of s-as-p namely the practitioners, practices and praxis; the activities of strategising in the context of ICT adoption was examined. Figure 9-2 captures the contextual overview of this study.

Figure 9-2: Contextual overview of this study and outcomes
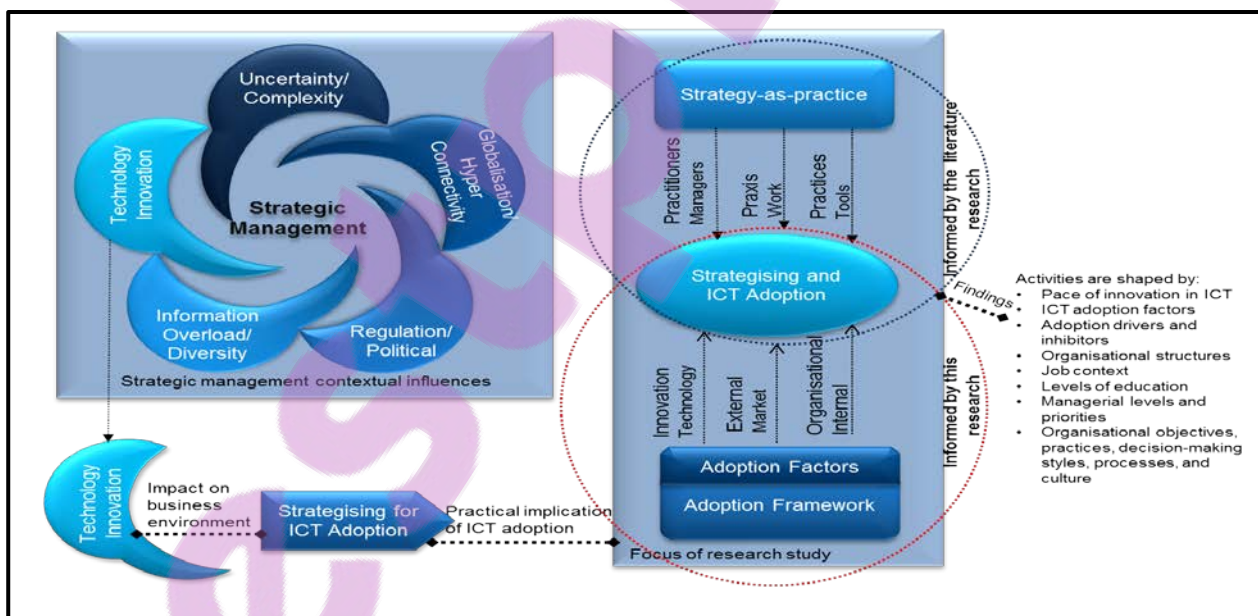
This dissertation provided an in-depth view of strategising for ICT adoption. It analysed literature to reveal the challenges facing management in the modern context where strategy formulation is concerned and using extant literature has developed a framework for ICT adoption. It also used this framework as a yardstick to analyse the findings of the case organisation. Each of the four papers reported on different critical aspect of ICT adoption and addressed the pertinent research questions related to each focus area. Additionally, it presented managerial implications and opportunities for future research. Chapter 9 summarized the overall findings of this study.

The ultimate revelation of this study was in making use of the strategy-as-practice approach to unpack the micro-activities of aggregate individuals and to understand the manner in which decision-making occurs for ICT adoption. The valuable insight that this information provided to managers was that strategising occurs at all levels of the organisation and the information gained can contribute valuably towards developing agile and robust strategies to navigate the organisation through the modern instabilities experienced in the business environment.

Ultimately, this study exposed the relationship between strategising and ICT adoption. In doing so, it has revealed some praxis and practices of practitioners of this study. Additionally, it showed that individuals, job context, level of education, managerial levels and managerial views all contributed towards strategic decisions regarding ICT adoption.

10 REFERENCES

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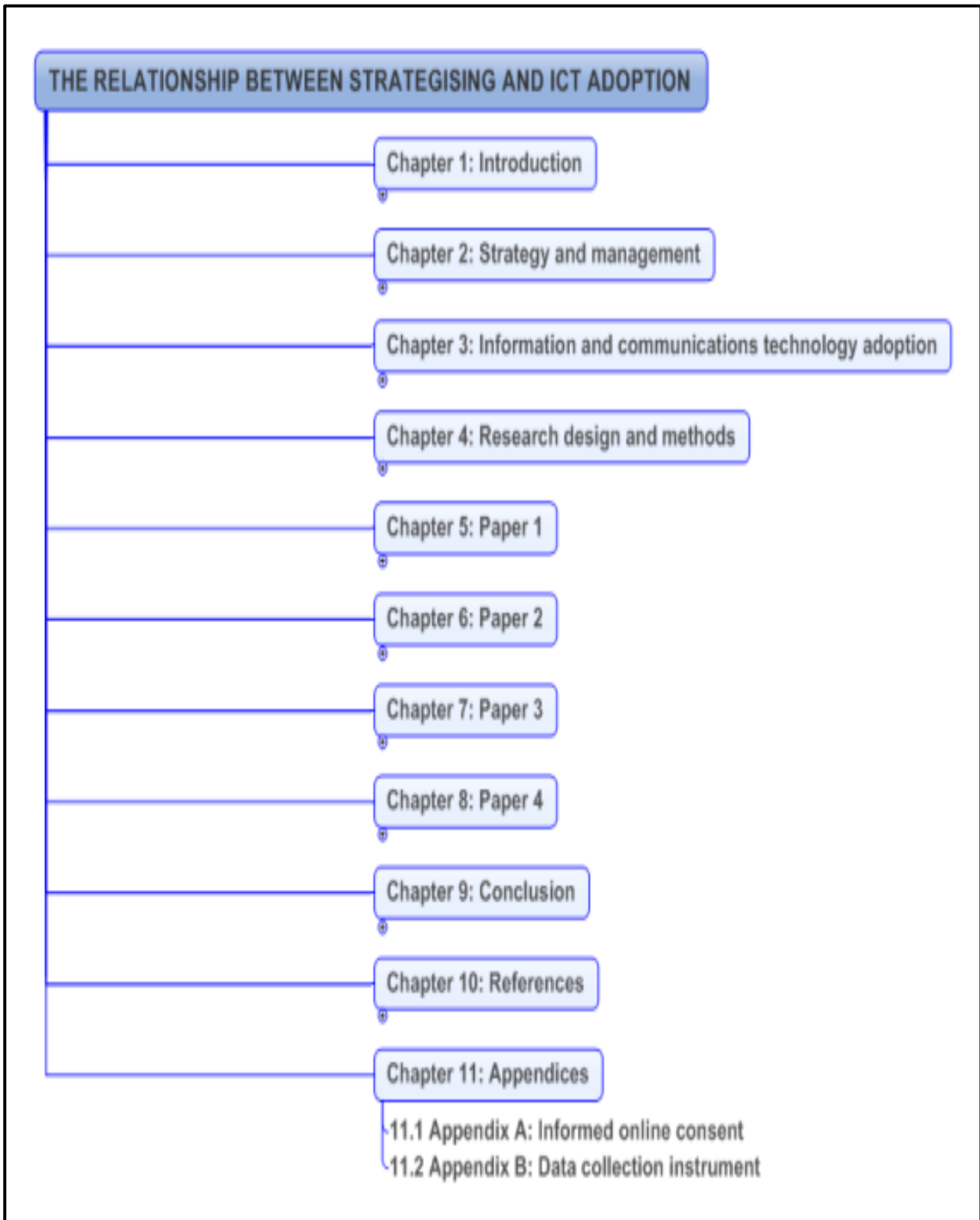
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11   APPENDICES

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11.1 APPENDIX A: INFORMED ONLINE CONSENT

Faculty of Economic and
Management Sciences

Informed consent for participation in an academic research study

Department of Business Management

THE RELATIONSHIP BETWEEN STRATEGISING AND ICT ADOPTION

Research conducted by:

Ms. N.M. Govender

Dear Respondent

You are invited to participate in an academic research study conducted by Neelambal Manival Govender, a Doctoral student from the Department of Business Management at the University of Pretoria.

The purpose of the study is to determine the relationship between strategising and ICT adoption. Strategy is critical to an organisation's success and, as such, can determine the success or failure of an organisation. Strategy formulation would be easy if the environments in which organisations operate were static. Given the fact that ICT adoption is essential to an organisation's competitive strategy and the fact that technology is constantly evolving, the contemporary environment is anything but static. Thus, this qualitative study aims to gain an understanding of the influence of ICT adoption on strategising from a strategy-as-practice perspective. It also aims to understand what the demands placed on management are, because of ICT adoption.

Please note the following:

Participation is voluntary; however, your valuable input would provide insight into the expectations of ICT adoption as a means to enhance and improve efficiency with potential strategic benefits.

By participating in this survey,

- I, the respondent, hereby consent to take part in the research study;
- I understand that data gathering will be confidential; and
- the results of the study will be made available on request.

Kindly note that the questions allow you to answer the questionnaire anonymously and that there are no right or wrong answers, just your opinion.

Thank you kindly for spending your valuable time to complete this survey.

To proceed with the survey,

Follow this link to the survey:

<<Link>>

11.2 APPENDIX B: DATA COLLECTION INSTRUMENT

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

INTRODUCTION:

Amid increased globalisation, technological innovation and changing social trends, the current environmental context within which organisations interact is facing increasing instability. Advances in technological innovation are the largest contributor to this instability and is constantly revolutionising the manner in which organisations operate. As a result, organisations are under extreme pressure to change or adapt quickly to their environments. Technology adoption serves as a vehicle that allows management to participate in a world of constant innovation, while at the same time enabling organisations to be strategically flexible and agile with potential strategic benefits.

Given the above context, the following questionnaire is part of a research study to investigate the relationship between strategising and ICT adoption.

Kindly note that the questions allow you to complete the questionnaire anonymously and that there are no right or wrong answers.

ICT refers to technology tools and associated equipment, desktop and laptop computers, software, peripherals and connections to the Internet that are intended to fulfil information processing and communications functions.

This survey takes approximately 10 to 15 minutes to complete. Your input will contribute significantly towards the outcome of the research.

Thank you for spending your valuable time to complete this survey.

Click ">>" to proceed

SECTION 1: ORGANISATIONAL DEMOGRAPHICS

SECTION 1 of 5: ORGANISATIONAL DEMOGRAPHICS

1.1   Please select your gender.

a. Female	
b. Male	

1.2   Please indicate your age.

a. 20-29 years	
b. 30-39 years	
c. 40-49 years	
d. 50-59 years	
e. 60+ years	

1.3   Please select your level of education.

a. Matric or less	
b. Diploma or Certification	
c. Degree	
d. Postgraduate degree	

1.4 Please select your business unit.

a. Bank Supervision	
b. Business Systems and Technology	
c. Corporate Services	
d. Currency Management	
e. Executive Management	
f. Financial Markets	
g. Financial Services	
h. Financial Surveillance	
i. Human Resources	
j. Internal Audit	
k. International Economic Relations and Policy Management	
l. Legal Services	
m. National Payment System	
n. Research	
o. Risk Management and Compliance	
p. Training College	
q. Security Management	
r. Strategy and Communications	

1.5 Please select the option that best describes your main job function.

a. Strategic	
b. Senior manager	
c. Line function	
d. Operational	

SECTION 2: GENERAL

SECTION 2 of 5: GENERAL

Kindly indicate the extent to which you agree with the following statements.

Note: there are no right or wrong answers, just your view.

2.1 ICT systems are essential in accomplishing business functions within the organisation.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

2.2 A good working relationship exists between business units and the ICT department.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

2.3 The business unit's strategic objectives are formulated by executive management ONLY.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

SECTION 3: DECISION-MAKING

SECTION 3 of 5: DECISION-MAKING

Kindly indicate the extent to which you agree with the following statements.

Note: there are no right or wrong answers, just your view

3.1 The <u>organisational policies</u> easily provide for the adoption of new technologies.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

3.2 The business unit depends on <u>the ICT department for guidance</u> on what technology to adopt that would best meet its business objectives.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

3.3 It is easy to obtain <u>budget</u> approval for the adoption of new technology for strategic business projects.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

3.4 When deciding to adopt new technology, is it of primary importance that the *technology* forms part of the organisation's ICT strategic investment.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

3.5 I am able to <u>contribute</u> towards my business unit's strategic objectives.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

3.6 The business unit's <u>strategy-making</u> occurs in the following manner;

	Never	Sometimes	Uncertain	Often	Always
a. Formal meetings					
b. Formal presentations					
c. Formal workshops					
d. Informal discussions					
e. Informal meetings					
f. Informal get-togethers					

3.7 When adopting new technology its *compatibility* to existing infrastructure outweighs the importance of its potential strategic business benefit.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

3.8   When adopting new technology its *stability* with existing technology outweighs potential strategic benefits.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

3.9   There is a heavy reliance on <u>strategic planning tools and processes</u> to assist decision-makers with strategic business decisions.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

3.10   Please rank the following ICT adoption factors to consider *when making a decision to adopt new technology* in order of importance from 1 to 5, where 1 is most important and 5 is least important.

a. Contribution towards operational effectiveness.	
b. Contribution to strategic business value.	
c. Keep abreast of the latest technology trends.	
d. Product maturity (how stable and widely adopted is the technology?)	
e. Compatibility and stability with existing internal technology.	

SECTION 4: MANAGEMENT

SECTION 4 of 5: MANAGEMENT

Kindly indicate the extent to which you agree with the following statements.

Note: there are no right or wrong answers, just your view

4.1   It is important that I keep abreast of technological innovations.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

4.2   The speed at which technology innovation is progressing influences business decisions when adopting new technology.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

4.3   Given the rapid pace of innovation in technology with potential benefits to strategic objectives, management has no choice but to adopt new technology.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

4.4   The demand on management's ability to execute day-to-day duties increases in complexity as a result of technology innovations.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

4.5   My personal experience and exposure towards technology influence my business decisions when recommending the adoption of new technology.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

SECTION 5: ICT ADOPTION

SECTION 5 of 5: ICT ADOPTION

Kindly indicate the extent to which you agree with the following statements.

Note: there are no right or wrong answers, just your view

5.1   The organisational culture adopts a technology focus view when searching for solutions that address the business strategic objectives.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

5.2   Please indicate the extent to which the following statements *support your business decision to adopt new technology sooner* (closer to the release of the technology on the market).

a.   The need to stay abreast of the latest technology.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

b.   Sufficient availability of knowledge or expertise about the technology.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

c.   Top management's support for and their positive attitude towards the technology.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

d.   The availability of resources internally and externally to support the technology.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

e.   Ease of use (*in relation to business function and implementation*) associated with the technology.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

f.   Technology characteristics in favour of increased operational effectiveness.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

5.3   Please indicate the extent to which the following statements *delay your business decision to adopt new technology sooner* (compared to when the technology was released on the market).

a.   A high initial demand for investment to implement the new technology

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

b.   Poor perceived user satisfaction and user experience regarding usability of the new technology.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

c.   Uncertainty regarding the strategic business benefit associated with the technology.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

d.   Adverse organisational culture towards the adoption of new technology.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

e.   Poor availability of multiple vendor support for the new technology.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

f.   A complex internal decision-making process for the adoption of new technology.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

5.4   Please rank the EXTERNAL FACTORS regarding preference when *considering the adoption of new technology for optimal strategic benefits* in order of importance, where 1 is important and 5 is least important.

5.4.1   EXTERNAL FACTORS

a. Stable technology that is widely adopted.	
b. Technology that provides a high return on investment.	
c. Technology that is widely compatible with other technologies.	
d. Multiple available vendor support for the technology.	

5.5   Please rank the INNOVATION FACTORS regarding preference when *considering the adoption of new technology for optimal strategic benefits* in order of importance, where 1 is important and 6 is least important

5.5.1   INNOVATION FACTORS

a. Perceived greater return on investment.	
b. Extends internal stability and compatibility.	
c. Low business functional complexity.	
d. Provides visible benefits.	
e. Contribution towards operational effectiveness.	
f. Not resource intensive.	

5.6   Please rank the ORGANISATIONAL FACTORS regarding preference when *considering the adoption of new technology for optimal strategic benefits* in order of importance, where 1 is important and 6 is least important

5.6.1   ORGANISATIONAL FACTORS

a. Positive user attitude	
b. Cost effective technologies.	
c. Larger strategic investment budgets	
d. Technology savvy users.	
e. Information-intense business units.	
f. Policies that easily provide for the adoption of new technology.	

5.7   The organisational culture adopts a technology focus view when searching for solutions that address operational efficiency.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

Thank you for spending your valuable time completing this survey.

End of survey.