



Guidelines to improve the use of knowledge management systems as intended: the perspective of end-users

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ABSTRACT

Knowledge is one of the most valuable assets for organisations because with the right knowledge, leaders are able to make informed decisions. Knowledge ought to be managed effectively for organisations to realise the benefits thereof. The management of knowledge is a complex subject as knowledge does not exist in one form. Knowledge can be tacit or explicit and both are equally important. Organisations invest in systems and technologies to support the management of knowledge. Knowledge management systems (KMSs) are an integral part of organisations; however, the use of these systems is still a concern as benefits, as envisaged by those who invest in the systems, are still not realised.

This study followed the interpretive paradigm as it aimed to understand the social context of KMSs, the processes followed to implement the systems and what influence the users to use or not to use the systems as intended. Benefits can only be derived if KMSs are used as intended. Intended use of information systems is presented to explain the meaning thereof. Various methods of measuring use as a subject of intended use is also presented to give context to the difference between the traditional ways of measuring information system use and the evaluation of intended use. The research questions were guided by literature review on how intended use of an information system can be evaluated. The questions focused on the chosen KMS, namely SharePoint. The evaluation of the intended use was approached from the perspective of those who use the KMSs.

Grounded theory was applied to the collection and analysis of data from the participants who are the users of the selected KMS for the organisation under study. The collection and analysis of data followed a constant comparative method where gathered data was constantly compared to generate a theory that is grounded in the data collected from the participants. The theory generated in this study is presented in the form of guidelines. The four proposed guidelines are rooted in the data collected from participants as they represent the perspective of those who use the system. The guidelines provide context in understanding what can be improved or introduced to enhance the use of KMSs as intended for the benefit of the organisations.

Keywords: Intended use; information systems; knowledge management; knowledge management systems and grounded theory.

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CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

The aim of this study was to understand the perspective of end-users regarding the intended use of knowledge management systems (KMSs) that they use and to develop and propose guidelines for improved use, i.e. as intended. According to Gartner (2016), knowledge management (KM) refers to a business process that supports the management and use of an organisation's intellectual assets. It promotes integration of information assets and enhances collaborative creation, capturing, organisation, access and use thereof. KM also includes tacit knowledge of people that has not yet been captured formally in a process or asset. So, people as well as information technology (IT) and systems are an integral part of KM. According to Alavi and Leidner (2001:114), KMSs refer to the collection of typical information systems and processes that are applied to elicit and manage organisational knowledge. These “support and enhance the organisational processes of knowledge creation, storage or retrieval, transfer, and application”

Seung *et al.* (2016:134) state that innovative technologies and systems are deployed by many organisations to leverage their knowledge assets. However, organisations are faced with a predicament of how to measure their return on investments committed to KMSs and maximise the use of the systems. In order to maximise return on investment, KMSs must be used as intended. The success of KMSs are dependent on both the end-users and technology. Technology alone cannot promote the expected returns as returns are realised from the use of technology by the end-users. Uriarte (2008:48) says that organisations have realised that deploying a solution is the easy part of supporting KM. The difficult part is getting all those involved to embrace and use the systems effectively to improve knowledge sharing and collaboration.

This chapter is organised in the following sections: Section 1.1 is the introduction to the study. Section 1.2 outlines the concepts central to the study. The background of the problem area is explained in Section 1.3. The motivation for the research is introduced in Section 1.4. The research objectives are stated in Section 1.5. Section 1.6 presents the research methodology. Section 1.7 explains the ethical considerations for this study. The chapter concludes with a summary encompassing everything that has been discussed.

1.2 CONCEPTS CENTRAL TO THE STUDY

This study focussed on the intended use of information systems (IS) from the perspective of end-users, with respect to knowledge management systems (KMSs). This is discussed next.

1.3 INTENDED USE OF INFORMATION SYSTEMS

Hasan *et al.* (2016:69) explain that “The state of the art of information system (IS) development is far from perfect in terms of implementing systems that fully meet user requirements.” End-users are the most important part of any IS as they can either use or not use the system as intended. Depending on how the system is introduced to them, the actual use might differ from the intended use. This has a potential of impacting benefits realisation. Dulipovici and Robey (2013:104) state that intended use can be perfectly aligned to the business strategy but “the ensuing patterns of use, or work practices, may result in strategic misalignment.” According to Seung *et al.* (2016:134), the literature on IT value has not yet advanced to a level where it can provide a guideline on how to assess the impact of IT at the usage level and thus benefits realisation. This should be the main concern to the people making decisions on IT investments.

Shaikh and Karjaluoto (2015:542) state that, in most cases, IS are underutilised and there is no will to measure and track the usage. End-users are, for example, not keen to explore new features that are made available to them. Understanding user buy-in for new systems is important as it contributes to the understanding of user adoption and behaviour post implementation. KMSs are part of the IS community and therefore, the Issues that are affecting the IS community also affect KMSs. The success of IS has been measured in many aspects, including “frequency of use, time of use, number of accesses, usage patterns, system dependency, and so on, none of these are directly applicable to knowledge use” (Freeze *et al.*, 2007:316). For this reason, this study focussed on the intended use of KMSs from the perspective of end-users. It explored a case of end-users in an organisation.

1.4 KNOWLEDGE MANAGEMENT SYSTEMS

In order to understand KMSs, it is important to first understand what knowledge is and then the management thereof. Knowledge has been defined by many writers. The subject has been approached from different perspectives and with different motives (Watson, 2003:4). One of the most quoted definitions of knowledge is the one defined by Davenport and Prusak and cited

by Wallace (2007:15), “[k]nowledge is a fluid mix of framed experience, values, contextual information, expert insight and grounded intuition that provides an environment and framework for evaluation and incorporating new experience and information. It originates and is applied in the minds of knowers. In organisations, it is often embedded not only in documents and repositories but also in organisational routines, processes, practices and norms.” There are two types of knowledge, namely tacit knowledge and explicit knowledge. Uriarte (2008:4) defines tacit knowledge as “knowledge that is stored in the brain of a person and explicit knowledge as knowledge that is contained in documents or other forms of storage other than the human brain.”

Knowledge is one of the most invaluable inputs into decision making, as well as for company and individual development (Watson, 2003:5; Etzkowitz & Viale, 2010:261). Janz and Prasarnphanich (2003:352) explain that “for many organisations, the notion of managing knowledge as a corporate resource has been looked to as one of the few foundational weapons that promise to deliver sustainable distinctive competencies in the future.” In this competitive world, knowledge has become a differentiating factor. Companies value knowledge as an important asset. With the right knowledge, companies can be leaders in their fields. Knowledge is no longer regarded as a phenomenon that is acquired and owned by individuals, but a resource that is needed for survival (Desouza, 2003:28; Janz & Prasarnphanich, 2003:352). For a company to be competitive, innovative and ahead of its competitors, knowledge must be managed effectively.

Freeze *et al.* (2007:310) state that KM is the process used by organisations to promote the sharing of knowledge and derive value from the intellectual assets. KM processes make information accessible throughout the organisation to advance their mission and vision (Mcinerney, 2002:14). Many organisations regard KM as a critical resource. They define business processes and invest in state-of-the-art technologies and systems to manage knowledge. Although substantial amounts of money are invested towards the management of knowledge, the end-users often use the technology as mere document management systems, replacing hard copy (manual) file storage systems (Kransdorff, 2009:ix). Alavi and Leidner (2001:114) caution organisations on the reliance of IT alone as an enabler of knowledge management. This is supported by Desouza (2003:28), saying that reliance on IT alone to

advance KM can be detrimental. Socialisation is another important factor in managing knowledge and it must not be disregarded.

The main aspect of KMSs is to facilitate the collection, storing, retrieving, sharing and application of knowledge within an organisation (Freeze *et al.*, 2007:316). KMSs are implemented not only for managers, but to the advantage of and for use by everyone in the organisation. KM is user oriented and therefore, for KMSs to succeed, users must know and understand the value of knowledge management. Managing knowledge should not be an activity that users are forced to perform but they must do it willingly, with the understanding of the benefits to the whole organisation (Du Plessis, 2008:289; Chung *et al.*, 2016:433). Cao *et al.* (2013:5565) explain that for KMSs to succeed, all those involved must be willing to make KM a success. Technology and people must work together to promote and advance the management of knowledge.

1.5 BACKGROUND OF THE PROBLEM AREA

KM impacts everyone in the organisation and therefore it should be beneficial to all. Although many organisations have processes and systems in place to manage knowledge, “a great deal of knowledge in the organisation is created and sits in the heads of people and groups of people who work in the organisation – the employees, managers and top executives.” (Uriarte, 2008:9) According to Dalkir (2017:3) most knowledge is deeply rooted in the tacit knowledge of employees who changes jobs frequently and as a results, the organisations valuable knowledge asset leave the company all the time. Figure 1.1, taken from Uriarte (2008:9), shows that 42% of knowledge is in employees’ brains, 20% is in electronic documentation and only 12% is in an electronic knowledge base. If end-users understand the intended use of KMSs, the gap between knowledge in electronic format and knowledge in employees’ brains should be relatively small.

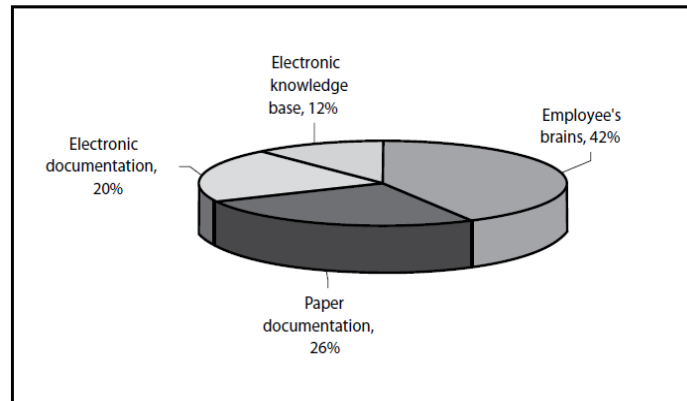


Figure 1.1: Primary repositories of an organisation's knowledge (Uriarte, 2008:9)

The problem that is addressed by this study is that there is a lack of understanding on the intended use of IS, specifically KMSs. This is supported by the statement made by Dulipovici and Robey (2013:2) that indicates that end-users may very well use a new system as intended, but it is not always the case. This impacts negatively on benefits realisation. This study presents the perspectives of end-users in terms of the intended use of the IS focusing on KMSs.

1.6 MOTIVATION FOR THE RESEARCH

The research was motivated by the existence of many barriers that prevent organisations as well as end-users from benefiting from KM. Du Plessis (2008:286) identified the following aspects as the general barriers to KM:

1. "Viewpoint on the definition of knowledge and knowledge management."
2. "Knowledge confidentiality."
3. "Do people know how to use knowledge management systems?"
4. "The role of language in knowledge management."
5. "Organisational culture."
6. "Shared understanding of knowledge management."
7. "Limited buy-in for knowledge management implementations."
8. "Knowledge attrition and low retention rates of highly skilled staff."
9. "Cost of knowledge management implementations versus value."
10. "Understanding and defining the need, i.e. reasons, for knowledge management."
11. "The role of technology."
12. "The role of skill levels amongst members of staff."

13. “Organisational management style.:
14. “User acceptance.”
15. “Understanding what critical knowledge to keep.”

All of the above listed aspects impact the end-users directly or indirectly. Research has been done on the benefits of KM from the organisational and industry leader’s point of view, yet, little has been done from the perspective of the end-users. For example, the studies done by Nevo and Chan (2007) and Seung *et al.* (2016) focussed on top management and excluded other types of users which form an integral part of KM. Hence, this study aimed to provide guidelines for improving the use of KMSs as intended, from the perspective of the end-users. In this study, the word ‘end-user’ refers to any person that could/should interact with KMSs, ranging from knowledge workers to executive management.

1.7 RESEARCH AIM AND OBJECTIVES

1.7.1 Primary objective

The primary objective of this study was to formulate guidelines for the improvement of the use of KMSs as intended. The researcher’s aim was to understand the perspective of end-users regarding the intended use of knowledge management systems (KMSs) that they use and to develop and propose guidelines for improved use, i.e. as intended. The investigation was done from the perspective of end-users, as they are the primary users of it and either use it as intended, or not. This research identifies what causes the gaps between intended use and actual use of KMSs.

The researcher conducted the research in a specific organisation and gathered the research data from the end-users of the company’s KMS. The researcher did not attempt to generalise the findings, as the research entailed a single case. However, the study provided rich insights into the perspective of the end-users of this KMS and paves the way for future research in this regard.

1.7.2 Secondary objective

Secondary objectives for this study are presented by the theoretical and empirical objectives. Theoretical objectives and empirical objectives are discussed next.

1.7.3 Theoretical objectives

The following are the theoretical objectives for the study:

1. To present a literature review on research approaches, encompassing research paradigms, methodologies and methods.
2. To present a literature review on intended use of IS, focusing on KMSs.
3. To present a background on the organisational objectives of the KMSs being investigated.

1.7.4 Empirical objectives

The following are the empirical objectives for the study:

1. To collect and analyse gathered data to find the perspective of the end-users in relation to a KMS and its intended use, so as to formulate guidelines to improve use.
2. To formulate and present the guidelines.

1.8 RESEARCH APPROACH AND DESIGN

There are four research paradigms that stand for different approaches, namely positivist (objective), interpretive (subjective), design science (create an artefact) and critical social theory (bring change or emancipation to a problem area). The research paradigms and justification for the selected approach is discussed and detailed in Chapter 2. The chosen research approach for this study is interpretive research.

According to Klein and Myers (1999:67), “[i]nterpretive research can help IS researchers to understand human thought and action in social and organisational contexts; it has the potential to produce deep insights into information systems phenomena including the management of information systems and information systems development.” With this study, the researcher aimed to understand the perception of end-users with regard to the intended use of KM and KMSs and therefore, it was conducted using an interpretive research methodology. Qualitative data was gathered and analysed. Interviews were used to collect the data and data was analysed using grounded theory.

1.9 ETHICAL CONSIDERATION

Permission to conduct the study in the nominated company was requested and obtained in writing from the relevant authorities that are mandated to give such permission. Participants were informed of the objective of the study prior to the interviews. The researcher obtained approval from participants to use the data collected during the interviews for this study. Participants were also advised that participation was voluntary and that they might, at any time, withdraw from the study without negative consequences to them. Participants were allowed to review their answers and given an opportunity to change what had been captured when they felt the statement captured was not clear enough. The nominated company was advised that they were allowed to review and study the results. No information of personal nature would be disclosed in order to protect the confidentiality of the nominated company and participants. Approval to do this study was also obtained from the relevant ethics committee of the North-West University (NWU). The following research questions were approved by the relevant ethics committee of the North-West University (NWU):

1. What is your current position level?
2. How long have you been using SharePoint?
3. What is your main purpose for using SharePoint?
4. When requirements are gathered, to what extend are you involved?
5. Would you like to be more or less involved with requirements gathering?
6. Substantiate your answer in question 3.
7. What is your understanding of the aim and objective of SharePoint?
8. Please describe how using SharePoint impact your day to day job?
9. What do you like most about SharePoint?
10. What would you change about SharePoint?
11. What type of training did you receive for using SharePoint?
12. Describe the value add of the training you received?
13. Explain what you do when you need help with the system.

1.10 CHAPTER CLASSIFICATION

This study comprises of the following chapters:

Chapter 1: Introduction

Chapter 1 introduces the research aim and objectives. In this chapter, the motivation for this research is explained.

Chapter 2: Research approaches and research design

This chapter presents a discussion on research approaches, encompassing research paradigms, methodologies and methods. The chosen approach is justified and motivated in this chapter. The application of the methodology and a research plan for this study are outlined.

Chapter 3: Intended use of information systems

In this chapter, a literature review of the intended use of IS is presented in order to understand why IS are implemented. A demonstration of the intended use of IS in accordance to the owner is presented.

Chapter 4: SharePoint as a knowledge management system

A discussion on KM and KMSs is presented with the aim of understanding the relationship between the two subjects. SharePoint as the chosen KMS in the organisation where the research was conducted, is explained in terms of the aims and objectives of the application, deployment strategy and benefits as envisaged by the owners of the application.

Chapter 5: Empirical study

In Chapter 5, it is discussed how participants were interviewed and data collected and analysed using grounded theory methodology. It explains the research approach as it was followed.

Chapter 6: Conclusion

Chapter 6 presents the summary of this study. The guidelines grounded on the data collected and analysed are presented in this chapter. The rigor of the research is evaluated against the

principles of grounded theory as a methodology applied in the study. Limitations for the study are outlined and recommendations for further studies are discussed.

1.11 SUMMARY

The problem introduced in this study is that IS are still not being used as intended. The owners of the systems may define the intended use of the systems, but it might differ from the actual use by the end-users. This study focussed on understanding the perspective of end-users regarding the intended use of KMSs, to develop and propose guidelines for improved intended use.

Knowledge is one of the differentiating factors in this competitive market and companies invest a substantial amount of money in order to manage and preserve this important resource. Knowledge is formed in the minds of individuals (tacit knowledge) and then translated into knowledge that can be stored and shared through systems (explicit knowledge). Users are vital in knowledge management and without them, knowledge can neither exist, nor be managed effectively.

CHAPTER 2: RESEARCH APPROACHES AND RESEARCH DESIGN

2.1 INTRODUCTION

The aim of this study was to understand the perspective of end-users regarding the intended use of the knowledge management systems (KMSs) that they use, to develop and propose guidelines for improved use, i.e. as intended. Research can be conducted in more than one way, i.e. according to different worldviews or paradigms. Researchers are motivated to do specific research and to conduct it in a particular way, based on certain assumptions that they have about the world they live in. These assumptions influence researchers in terms of the area they choose to research, the topic of the research and even the approach they take in doing the research. Mack (2010:6) states that the background, knowledge and philosophical assumptions of the researchers are directly linked to the research they undertake. The researcher's assumptions ought to be clearly stipulated in the research and it must be understood by the reader. Porra *et al.* (2014:542) explain that, what underpins every research study, are the philosophical assumptions of the researcher. The researcher's assumptions or beliefs are called paradigms. These assumptions exist, even though they are sometimes not acknowledged or discussed by the researcher. It is, however, important to clearly explain these at the beginning of a research study, to ensure that the researcher (and reader) have the same understanding of why and how the study was conducted. Therefore, in this chapter, the researcher aims to position the research and to motivate the chosen paradigm and methodology.

The chosen paradigm for a research explains the intention, motivation and expectations for the research (Mackenzie & Knipe, 2006:2). Once a research paradigm has been selected, the researcher is able to clearly outline how the research will be conducted. Mackenzie and Knipe (2006:2) explain that the first step for any research project is to choose a research paradigm because the research methodology and design are based on the nominated paradigm. Selecting and committing to a research paradigm is a vital step in any research and therefore research paradigms are discussed first in this chapter, with the aim of selecting a suitable paradigm that guides how the study is conducted.

This chapter is structured as follows: Section 2.1 is the introduction to the chapter; Section 2.2 presents the research paradigms; Section 2.3 introduces the paradigm suitable for the study; Section 2.4 outlines the interpretive research approach for the study; Section 2.5 presents the

data collection method; Section 2.6 presents the data analysis method followed; Section 2.7 outlines an explanation of the coding process; Section 2.8 presents the interview questions and an explanation for each question And Section 2.9 presents the selection of participants. The chapter is concluded with a summary in Section 2.10.

2.2 RESEARCH PARADIGMS

The definition of a paradigm encompasses many elements. Research paradigms have been defined by various writers and from the many definitions that exist, the most common explanation is that it is a framework, belief system or worldview that guides researchers on how to conduct research (Guba & Lincoln, 1994:105; Collis & Hussey, 2013). A paradigm is made up of four components, namely ontology, epistemology, methodology and methods (Scotland, 2012:9; Dammak, 2015:2). It is based on people's philosophical assumptions about the world (ontology) and the nature of knowledge (epistemology). Maree (2004:47) says that a "paradigm is a set of assumptions or beliefs about fundamental aspects of reality which gives rise to a particular world view, it addresses fundamental assumptions taken on faith, such as beliefs about the nature of reality (ontology), the relationship between the knower and the known (epistemology) and assumption about methodologies." According to Scotland (2012:9), researchers working in different paradigms subscribe to different ontological and epistemological views - their assumptions in terms of reality and knowledge differ. Scotland (2012:10) further explains that any research project starts with committing to an ontological and epistemological position. Hence, the researcher must choose and justify why a specific paradigm is chosen over others. To fully understand paradigms and how they influence the researcher's approach, the researcher investigates the subject, in order to understand it in its entirety. Therefore, in this this chapter, each paradigm is discussed based on the ontology, epistemology, methodology and methods, in order to understand what each paradigm represents and which one suited this study best. Before the paradigms are introduced, the four components of research paradigms (ontology, epistemology, methodologies and methods) are discussed.

Scotland (2012:9) states that "Ontological assumptions of a paradigm are concerned with what constitutes reality, in other words what is." Guba and Lincoln (1994:108) explain that ontology answers a question, namely: "What is the form and nature of reality and, therefore, what is there that can be known about it?" Ontological beliefs encompass the subject being studied and

it investigates the objectivity and subjectivity of the empirical world. Objectivity refers to the assumption that the world exists independent of humans, while subjectivity refers to the existence of the world through the activities of humans in making and forming it.

In order to understand epistemology, the origin of the term epistemology was investigated. Krauss (2005:758) states that “the term epistemology comes from the Greek word *epistêmê*, their term for knowledge.” Epistemological assumptions are concerned with how knowledge can be created, acquired and shared, i.e. it explains what it means to know. Every researcher has an objective of what he/she wants to achieve. Hence, the knowledge to be acquired through research is linked to the research objectives. Guba and Lincoln (1994:108) explain that epistemology, to obtain knowledge, is threefold: it answers a question related to the relationships between the person who knows, the one who wants to know and what is out there that can be known.

Ontology and epistemology influence the type of methodology the researcher chooses. Tuli (2011:99) states that “[t]he selection of research methodology depends on the paradigm that guides the research activity, more specifically, beliefs about the nature of reality and humanity (ontology), the theory of knowledge that informs the research (epistemology), and how that knowledge may be gained (methodology).” Porra *et al.* (2014:570) further explain that the acceptable methodology to obtain knowledge is influenced by the assumptions of the theory of what constitute valid knowledge and the nature of physical and social reality. According to Scotland (2012:9), methodology addresses the “why, what, from where, when and how data are collected and analysed.”

A research method consists of a set of specific procedures, tools and techniques to gather and analyse data. However, a research method is independent from methodologies and paradigms. There is no method that is exclusively applicable to a specific research paradigm. According to Myers (1997), a “research method is a strategy of inquiry which moves from the underlying philosophical assumptions to research design and data collection.” Scotland (2012:10) explains that the data collected can be qualitative (non-numeric in nature) or quantitative (numeric in nature). Research is not restricted to either qualitative or quantitative data; the type of data collected can be used exclusively or use both simultaneously. When qualitative and quantitative data are collected and analysed simultaneously; the data analysis method is called mixed methods.

In order to choose the research paradigm, methodology and method(s) suitable for this study, the four research paradigms prevalent in IS research (positivism, interpretivism, critical social theory and design science) had to be investigated and are discussed next in terms of their positions on ontology, epistemology, methodology and methods.

2.2.1 The positivistic research paradigm

According to Mack (2010:10), “the term positivism was first coined by the founder of positivism, Auguste Comte, the French philosopher who believed that reality can be observed.” The positivistic paradigm assumes that reality exists objectively and the object of study is independent of the researchers (Krauss, 2005:759; Shah *et al.*, 2013:2376).

2.2.1.1 Ontological position of positivism

The ontological position of positivism is one of realism (Scotland, 2012:10; Shah *et al.*, 2013:2377). Realism assumes that reality exists, and its existence does not depend on the knower. There is only one reality and researchers ought to go out there and find out what that reality is. Reality exists, whether it is being researched or not. The researcher and the researched subjects are independent entities, which means they have no relationship with each other. The object being researched is not affected by the researcher, it is what it is, meaning that “what we can learn about the world does not depend on who we are or how we personally experience it” (Oates, 2008:284). The researcher exists outside of the object and has no influence over it. The only thing the researcher has control over is the research process (Taylor & Medina, 2013:2). Reality does not change, meaning that, should the same process be repeated by another researcher, they will “get the same results irrespective of any personal traits of the second researcher” (Olivier, 2004:110). The process followed ought to be documented thoroughly for it to be repeatable or tested.

2.2.1.2 Epistemological position of positivism

Epistemologically, positivists advocate the use of a scientific approach by developing numeric measures to generate acceptable knowledge. Positivists believe that reality can be measured and hence, the focus is on reliable and valid tools to obtain results. The positivist epistemology is one of objectivism. Positivists go forth into the world impartially, discovering absolute knowledge about an objective reality. The main argument is that knowledge is acquired through

objective methods. Researchers ought to be objective in order to get the right knowledge about the reality. Table 2.1, taken from Mack (2010:7), shows more details about the ontology and epistemological positions of positivism. It shows a summary of the ontological and epistemological assumptions of the positivist paradigm.

Table 2.1: Positivistic research’s ontology and epistemology (Mack, 2010:7)

Ontological assumption	Epistemological assumption
• Reality is independent of the researcher. • The meaning of object exists and does not depend on whether the meaning is known or not. • Intelligence has a role in predicting and capturing of reality.	• Knowledge is objective. • Theory and hypothesis directly influence the knowledge acquired. • Knowledge acquired is truthful, unquestionable and undisputed. • Natural science methodology can be used in a social context.

2.2.1.3 The methodology and methods of positivism

The methodology used in positivism explains the relationships among various phenomena (Scotland, 2012:10; Shah & Al-Bargi, 2013:255; Dammak, 2015:3). The scientific nature of positivism means that the methodology is experimental and manipulative (Wilson, 2001:176). However, it can be applied to both the natural and social world (Guba & Lincoln, 1994:110). Questions and hypotheses are tested and verified by experiments. According to Scotland (2012:10), “Positivists view their methodology as value neutral, thus the knowledge generated is value neutral”, meaning that the researcher ought to be impartial and non-judgemental.

The nature of the positivism paradigm is that it comprises of facts that can be proven true. The data collection methods used often generate quantitative data and the interpretation of data is objective. Therefore, positivist researchers use data collection methods to gather quantitative, numerical data that can be tabulated and analysed statistically. Examples of positivist methods are experiments, quasi-experiments, standardised tests, scales, questionnaires, closed ended questionnaires, structured interviews and descriptions of phenomena employing standardised observation tools (Pring, 2000:34). According to Shah *et al.* (2013:2378), the method is not prescriptive as “the choice of method is up to the researchers to decide according to their

specific paradigms, theoretical perspectives and study designs.” Any of the above-mentioned methods can be used to collect and analyse data in positivistic research.

2.2.2 The interpretivist research paradigm

The purpose of interpretivist research is to understand the settings for social interactions, especially from the perspective of the participants. Knowledge is acquired through social interaction with participants. Communication and understanding of the message that the participant conveys to the researcher are core to interpretivist research. It is the researcher’s responsibility to make sure that the message is understood and presented clearly, as language is socially constituted (Olivier, 2004:112). The researcher is the main instrument through which the data is collected and analysed (Maree, 2004:60). The main goal is to understand what is being studied through the meaning the participants attach to it, as meaning attached to a phenomenon differs from person to person.

According to Maree (2004:60), “the ultimate aim of interpretivist research is to offer a perspective of a situation and to analyse the situation under study to provide insight into the way in which a particular group of people make sense of their situation or phenomenon they encounter.” Klein and Myers (1999:74) explain that the researcher’s interactions with the participants in a social context result in factual information being produced. The researcher interacts extensively with participants even though the researcher is not directly involved.

2.2.2.1 Ontological position of interpretivist research

The ontological assumption of the interpretivist research paradigm is that social reality is seen by multiple people and these multiple people interpret events differently, resulting in multiple perspectives of an object (Mack, 2010:8). The ontological position is that of relativism. Interpretivists do not believe that reality is out there, rather, they view it as socially constructed (Shah & Al-Bargi, 2013:257). Reality is constructed or reconstructed by human beings. Reality differs from person to person and therefore, language, history, cultures and belief systems play an important role in making sense of reality.

2.2.2.2 Epistemological position of interpretivist research

The interpretivist epistemology is one of subjectivism, which is based on real-world phenomena (Scotland, 2012:11). Because human beings understand the world by attaching meaning to it, the existence of an object can only make sense once a meaning is attached to it. The researcher gains knowledge by directly observing or interacting with participants. The main purpose is to understand that and not to question why things are the way they are. Scotland (2012:12) explains that “interpretivists aims to bring into consciousness hidden social forces and structures.” Findings by the researcher bring a new perspective into understanding why people act or do things in a particular way and not to justify. Table 2.2, taken from Mack (2010:8), shows a summary of the differences between ontological and epistemological assumption of the interpretivist paradigm.

Table 2.2: Interpretivist research’s ontology and epistemology (Mack, 2010:8)

Ontological assumption	Epistemological assumption
• Subjective nature of reality means that reality is directly linked to individuals’ interpretation of the situation • Meanings are allocated based on the people’s interpretation of the events. • Events are unique and must be treated as such • For one event, multiple perceptions can be assumed. • Meanings and symbols that are interpreted determine relationships in social sciences	• The creation of knowledge includes subjective meaning allocated by people with different views regarding the object under study. • Theory is created based on the knowledge gained. • Situations and personal experience give rise to knowledge

2.2.2.3 The methodology and methods of interpretivist research

Scotland (2012:12) lists the examples of methodologies that are used in interpretivist research. The list includes “case studies (in-depth study of events or processes over a prolonged period), phenomenology (the study of direct experience without allowing the interference of existing preconceptions), hermeneutics (deriving hidden meaning from language), and ethnography (the study of cultural groups over a prolonged period).”

Interpretivist methods yield insight and understandings of behaviour, explain actions from the participant's perspective and do not dominate the participants. Examples include open-ended interviews, focus groups, open-ended questionnaires, open-ended observations, think-aloud protocol and role-playing. These methods usually generate qualitative data (Scotland, 2012:12). The methods are relational, naturalistic, subjective, interpretive and descriptive (Maree, 2004:66).

2.2.3 The critical social theory research paradigm

The critical paradigm seeks to address issues of social injustice and marginalism. The emancipatory function of knowledge is embraced. Different theoretical perspectives of critical inquiry include Marxism, queer theory and feminism. The starting point of a critical researcher is often preconceived because what the researcher believes in influences the outcome of the research. Critical research is concerned with bringing to the fore the oppressions caused by the status quo. It uncovers the struggles of people, whether they are aware of it or not. Klein and Myers (1999:24) explain that there are three elements of critical research: "insight, critique and transformative redefinition." The three elements are supported by Guba and Lincoln (1994:113) with the explanation that "the aim of critical inquiry is the critique and transformation of the social, political, cultural, economic, ethnic, and gender structures that constrain and exploit humankind, by engagement in confrontation, even conflict." Table 2.3 shows the three elements of critical research. The table was taken from Klein and Myers (1999:24) and includes their brief descriptions.

Table 2.3: Definition of the elements of critical research (Klein & Myers, 1999:24)

Elements of critical research	Brief description
Insight	This element is concerned with interpretation and gaining insight. Insight can be gained in various ways, e.g., using critical hermeneutics and the archaeology of knowledge, or the concepts of social reproduction via the mechanism associated with symbolic capital.
Critique	This element is concerned with critique, the genealogy of knowledge and the social practices of control and reproduction. This element goes beyond interpretation to focus the research on the power structures that lie behind accepted interpretations.

Elements of critical research	Brief description
Transformation	This element is concerned with suggesting improvements to the conditions of human existence, existing social arrangements and social theories. Theories are not the primary driver for change, but potential fallible lenses through which we see the world. The ultimate arbiters of the desirability of changes are those affected by the.

2.2.3.1 Ontological position of critical social theory

Scotland (2012:13); Maree (2004:62) and Guba and Lincoln (1994:110) are in agreement about the ontological position of the critical paradigm, i.e. that it is of historical realism. Historical structures exist and they are kept alive by people who continuously reproduce and maintain these structures. Reality in critical social theory is socially constructed and influenced by, for example, social, race, political, cultural, economic, ethnic and gender values (Guba & Lincoln, 1994:110; Scotland, 2012:12).

2.2.3.2 Epistemological position of critical social theory

Critical epistemology is one of subjectivism and it is transactional (Guba & Lincoln, 1994:110). Subjectivisms is based on real-world phenomena and linked with societal ideology (Scotland, 2012:12). Transactional refers to “the interactive relation between the researcher and the participants and the impact of social and historical factors that influence them” (Dammak, 2015:8). It is context based, i.e. how you see reality depends on the context of the reality (Wilson, 2001:176). Reality is constructed by people and therefore alterable by human action. Because the investigator is directly involved, what can be known is influenced by both the researcher and the participants. The researcher and participants have a relationship and therefore, the researcher does not make decisions in isolation. Table 2.4, taken from Mack (2010:9), shows a summary of the ontological and epistemological assumptions of the critical social theory paradigm.

Table 2.4: Critical social theory’s ontology and epistemology (Mack, 2010:9)

Ontological assumption	Epistemological assumption
• Social reality is defined from the experience of those who are part of the community. • Social reality is socially constructed through media institution and society. • How a community behaves socially is as a result of various factors that are exposed to that community. These factors can be oppressive to one at the same time providing freedom to another person. Power and dominance play a big a role.	• Communities and media institutions socially construct knowledge. • Those who are in a position of power determine what constitute valuable knowledge. • Knowledge is produced by power and is an expression of power rather than truth.

2.2.3.3 The methodology and methods of critical social theory

According to Dammak (2015:8), a critical methodology allows participants to be aware of the environment in which they live in and prompts them to question certain norms, such as injustices and discrimination. Critical methodologies include critical discourse analysis (examines how social and political domination is realised in text and talk), critical ethnography (an ideologically sensitive orientation to the study of culture), action research (a cyclical process of investigation, action and evaluation which results in a change in practice) and ideology critique (exposes hidden ideology by revealing participants’ places in systems which empower or disempower them) (Scotland, 2012:14). Both the researcher and participant are involved and according to Dammak (2015:8), participants are allowed to assist with the “design of the questions, collecting and analysing data” as they both have vested interests in the outcome of the research.

The methods used in critical social research allow for reality to be investigated from a “cultural, historical and political stance” (Scotland (2012:14). Examples of critical social theory methods are “open-ended interviews, focus groups, open-ended questionnaires, open-ended observations, surveys and journals” (Scotland, 2012:14). Qualitative data is usually generated through these methods. Although the methods usually produce qualitative data, both qualitative and quantitative data collection methods can be used, depending on the nature of the study undertaken.

2.2.4 The design science research paradigm

Design science research (DSR) is a research paradigm in which a designer answers questions relevant to human problems via the creation of innovative artefacts, thereby contributing new knowledge to the body of scientific evidence. According to Purao (2002:4), the main characteristics that differentiate DSR from others are design, invention, teleological stance, axiological perspective and pragmatic attitude. The list below, taken from Purao (2002:4), gives a brief explanation of each key element of DSR:

1. “Design, from the Latin *designare*, which means to point the way.”
2. “Invention, that is not discovery or replication.”
3. “Teleological Stance, that is purposeful advancement, ensuring relevance.”
4. “Axiological perspective, that is, value-orientation.”
5. “Pragmatic attitude, that is, a focus on making it work, requiring rigor.”

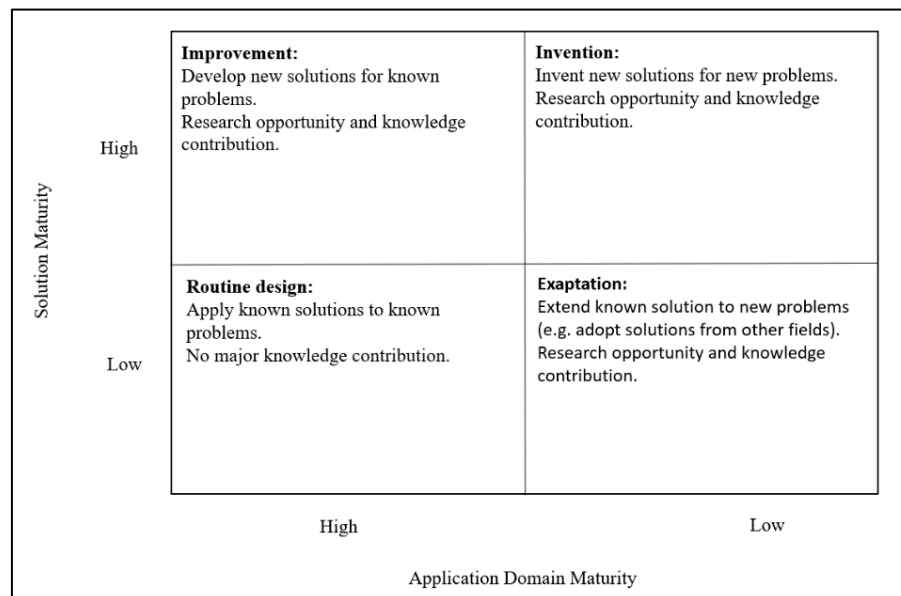


Figure 2.1: DSR knowledge contribution framework (Gregor & Hevner, 2013:345)

Although the idea is to unearth new knowledge, the innovative artefacts might be an improvement to an already existing artefact, invention of a new artefact or routine design. Figure 2.1, taken from Gregor and Hevner (2013:345), shows the DSR knowledge contribution framework. The knowledge framework depicts how DSR knowledge can be classified.

According to Gregor and Hevner (2013:344), a “fundamental issue is that nothing is really new.” Existing data or ideas are used to construct new things. Vaishnavi and Kuechler (2004) explain that, in the case of DSR, all or parts of the phenomenon may be created, as opposed to naturally occurring and therefore they must be built from existing ideas or knowledge. Human beings are at the heart of design science, as the artefacts are manmade.

Design science will not be possible without the involvement of human beings as it requires the understanding of the nature of the problem in order to devise a solution. It focuses mainly on problems, the process of solving the problems and the solution. According to Simon (1996), cited in Hevner (2007:89), DSR is motivated by the desire to improve the environment by the introduction of new and innovative artefacts and the processes for building these artefacts in order to improve the way people do things and the way they live. While positivists focus on the truth, DSR focuses on utility. Utility means the fulfilment of identified business needs by an artefact. Gregor and Hevner (2013:345) define the term artefact as a “thing that has or can be transformed into a material existence as an artificially made object (e.g. model, instantiation) or process (e.g. method, software).” Design science has its roots in disciplines such as engineering, IT, arts and architecture (Hevner, 2007:88).

2.2.4.1 Ontological position of design science

The ontology of design science is that of positivism, interpretivism or critical social theory, depending on the purpose of the research. According to Iivari and Venable (2009:5) “DSR may adopt a realistic or anti-realistic ontological position.”

2.2.4.2 Epistemological position of design science

Vaishnavi and Kuechler (2015:31) state that “epistemologically, the design science researcher knows that a piece of information is factual and knows further what information means through the process of development/circumscription.” The epistemology of design science research is knowing through making. Because artefacts are iteratively developed, every iteration produces new knowledge and learnings (Iivari & Venable, 2009:9). Table 2.5, taken from Iivari and Venable (2009:6), shows a summary of the difference between ontological and epistemological assumption of DSR.

Table 2.5: A summary of design science’s ontology and epistemology (Iivari & Venable, 2009:6)

Ontological assumption	Epistemological assumption
• Multiple, contextually situated alternative worlds-state. • Socio-technologically enabled.	• Knowing through making: objectively constrained construction within a context. • Iterative circumscription reveals meaning.

2.2.4.3 The methodology and methods of design science

According to Puraio (2002:17), “the methodology for design research can be characterised as a hermeneutic process that explicitly considers the inner and the outer environments of the artefact. The design researcher enters the hermeneutic circle with an idea of an anticipated meaning of a yet-to-be-created artefact.” DSR mostly uses qualitative data generation methods. Examples are interviews, observations, questionnaire and documents (Oates, 2008:116).

Oates (2008:116) explains that:

1. Interviews and questionnaires are mostly used to find out from the end-user how they view the IT artefact.
2. Observation to record how people use the IT artefact.
3. Existing documents like procedures, manuals and job description to see the impact of the IT artefact on people.

2.3 PARADIGM SUITABLE FOR THIS STUDY

The selection of a suitable paradigm for this study was guided by the epistemological and ontological position of each paradigm. Positivism is not suitable for this study as the aim is not to study an objective reality. The study is conducted in a social context where multiple users are involved and therefore subjective. Although critical social theory is in a social context, the aim of this study was not to emancipate the end-users but rather to improve the understanding of the intended use of knowledge management systems (KMSs). DSR is rejected on the basis that there is no development of an artefact as part of the research. The suitable paradigm chosen for this study is thus interpretivism.

The ultimate aim of interpretive research is to offer a perspective of a situation and to analyse the situation under study, to provide insight into the way in which a particular group of people make sense of their situation or phenomena they encounter. The aim of this study was to provide the guidelines for improving the understanding of the intended use of KMSs, from the perspective of end-users. The chosen paradigm is supported by a statement made by Klein and Myers (1999:69), i.e. that “IS research can be classified as interpretivist if it is assumed that our knowledge of reality is gained only through social constructions such a language, consciousness, shared meanings, documents, tools and other artefacts.” The guidelines for improving the understanding of the intended use of KMSs is developed from the perspective of the end-users and therefore the research is subjective. The ontological (relativism) and epistemological (subjectivism) positions of interpretivism is in line with the objectives of this study.

2.4 INTERPRETIVIST RESEARCH APPROACH FOR THIS STUDY

One of the main elements of IT is artefacts that are referred to as information systems (IS). This study focuses on IS that are developed for knowledge management (KM), i.e. KMSs. More and more organisations are realising that managing knowledge is a crucial aspect of any business. KM is very complex in a sense that it is often more than one, integrated systems that are deployed for managing knowledge. Multiple systems can be implemented for managing knowledge, as management of knowledge involves the capturing, storing, retrieval and application of knowledge. Many companies rely on IT systems, as automation of processes is on the increase. According to Willcocks *et al.* (2016:136), “this increasing reliance on IT has been accompanied by the growth in losses associated with the inappropriate or unintended use of IT-enabled privileges and with system failures.” Oates (2008:292) states that “interpretivist research in IS and computing is concerned with understanding the social context of an information system: the social process by which it is developed and constructed by people and through which it influences, and is influenced by, its social setting.”

Understanding of the behaviour of users of IS is key to this study as IS are developed by humans for other humans. In some cases, users behave in an unexpected way or use the system for what it is not intended for. There are cases where the understanding of the intended use of a system by the end-users is questionable because of their behaviour. Intended use is always implied in the requirements and also in the artefact delivered if not explicitly stated hence there is always

expectations on how users should behave (Chau, 1996:187). Intended use is not always understood by the end-users and therefore intended use might not be congruent with the actual use. In order to understand the perspective of the end-users, or what drives or motivates them to do what they do, meanings created and associated with the world around them must be understood. This can be done in a social context whereby the investigator and the participants are both involved.

Tradition, culture and social background often influences the behaviour of end-users and hence it must be taken into consideration by the researcher. The decision to choose interpretivist research was motivated by a statement made by Butler (1998:11), i.e. that it has been proven many times that the most appropriate vehicle to study (and understand) IS phenomena is through interpretivist research. IS researcher may choose among several interpretivist approaches when investigating IS-related phenomena. The research does not focus on the development of an artefact but the understanding of the use thereof by the end-users. The interpretivist research methodology followed is discussed next.

2.4.1 Interpretivist research methodology for this study

Myers (1997:6) states that choosing a research methodology must be done very carefully as it does not only affect how the research is designed, but it has an impact on how data are collected by the researcher. There are many methodologies that fall within the broader category of interpretivist approaches, including grounded theory, hermeneutics, interpretivist case studies, ethnography, discourse analysis, phenomenology and intentional analysis (Myers, 1997:6; Butler, 1998). For this study, the following approaches which are mostly applicable in the IS research are investigated with the aim of choosing a suitable one for the research: hermeneutics, ethnography, phenomenology and grounded theory.

2.4.2 Hermeneutics

Butler (1998:12) explains that the word hermeneutics come from the Greek word *hermēnetikós*, which refers to Hermes. Hermes was the messenger of gods who was entrusted with taking god's message to convey it to mortals. The role was not only to convey the message, but also to understand and translate the message in a way that mortals would understand and, accordingly, take action. The most critical part for Hermes was that he had to understand both

worlds, the world of the gods as well as the world of the mortals. Hermes have to make sure that the mortals understand what the gods are saying by unpacking and translating the message into a language the mortals can understand. Olivier (2004:115) explains that “Hermeneutics attempts to interpret a text from the point of view of its author.” The message must be interpreted from the viewpoint of the author and not be altered in any way.

2.4.3 Ethnography

Ethnography is also known as participant observation; the method is based on observing participants in their natural setting. Culture plays a very important role and the researcher is also a participant as he/she must experience the culture to understand the context (Olivier, 2004:114). Oates (2008) defines ethnography as the “description of people or cultures.” Maree (2004:25) explains that ethnography comes from “two Greek words, *ethnos* (people) and *graphein* (to write).” Time is spent in the field with participants, learning and writing about the community or group that is being researched. The researcher does not only focus on language, but also on the actions, gestures, dances and symbols as they all have meanings in a particular cultural setting. Trust plays a very critical role as no one will allow just anybody into their personal space, without understanding the context of the research. The researcher and researched ought to be fully engaged and hold no barriers. The participant must be willing to hold nothing back for the researcher to get even the smallest details because in ethnography, every little detail matter. The research gives the rich description rather than justification of why things happen the way they do.

2.4.4 Grounded theory

Grounded theory was developed by Barney Glaser and Anselm Strauss in 1967. In grounded theory, the researcher does not have a preconceived theory that must be tested but goes into the field to get the initial theory. The theory must be linked to the real-world experience. Once the theory is established, more data are collected from different participants to form rich and powerful explanation. Data are collected and analysed continually. Olivier (2004:115) explains that “[g]rounded theory, by contrast, begin by observing the field of interest and then allows the theory to emerge from what is observed.” Unlike many other research methods, grounded theory does not seek to describe and explore phenomena, but it serves to explain the phenomena being studies from the perspective and in the context of those who experience it (Birks & Mills,

2015:16). Data collected from the real-world experience are used in the development of the theory. The theory is grounded on the data collected from participants, by the researcher. The researcher relies on the participants to understand their perspective or experience in a given context. The researcher seeks to understand the world as seen through the lens of the participants.

In IS, grounded theory method was first introduced by Orlikowski in 1993; this paper investigated the use of CASE tools from the perspective of the end-users. This study is similar to what the researcher aimed to investigate in a sense that the researcher investigates the actions of the end-users, their understanding of the systems in the organisational context within which the systems must be used including the processes that must be followed. According to Birks and Mills (2015:17), grounded theory serves best in a situation where:

1. Little is known about the area of study
2. The generation of theory with explanatory power is a desired outcome
3. An inherent process is imbedded in the research situation that is likely to be explicated by grounded theory methods

For information systems research, Bryant and Charmaz (2007:350) suggest the following five guidelines for the application of grounded theory which are not prescriptive but flexible. These guidelines do not only apply to information system research, but researchers in other discipline can use them as well.

1. **Guideline 1:** The preliminary literature review as orientation and not defining the framework. For a novice researcher, it is advisable not to do preliminary literature studies as it might influence the way the researcher analyses data and, for example, define categories. This is just a suggestion and must not be taken as a rule. For grounded theory, it is advisable to conduct a literature review to engage with other existing theories and hence, it is done once the objective for the study is finalised. Literature reviews must not be used to shape the research, but to determine the relevance of the research.
2. **Guideline 2:** Coding for theory generation as opposed to superficial coding. For information systems, line by line coding is recommended as it goes to the lowest level of the details. If data are coded in this manner, one can be positive that nothing will be

omitted and the story will be relayed without imposing any personal feelings or views. In some cases, where line by line coding is not possible due to the density of the data, the researcher can opt for paragraph for paragraph coding.

3. **Guideline 3:** Use of theoretical memos and diagrams to aid the theory building process. The use of memos is very crucial in grounded theory as they are very important in understanding and explaining the data. The use of diagrams is also important when explaining the relationship between categories.
4. **Guideline 4:** Building the emerging theory and engaging with other theories. Researchers argues that grounded theory's low-level details make it difficult to engage with other theories. The theory is based on the lowest level of details and it is too descriptive to compare to existing theories. Theory must be scaled up to make it comparable with other theories.
5. **Guideline 5:** Clarity of procedure and chain of evidence. Grounded theory is straightforward, as it provides the researcher with the order in which things happens. Theory is built from the data and the data provide more information on the sequence of events that leads to the theory.

When doing grounded theory research, the following criteria, as explained by Birks *et al.* (2013:2), must be used as a guide for the researcher:

1. **Theory development:** theory must be developed from the data and it must provide rich description of the phenomenon. The theory must be grounded in the data.
2. **Constant comparison:** grounded theory is not a linear method, as and when new theories emerge, the researcher constantly compare the initial data with emergent data. The data collection method employed must be iterative in nature.
3. **Iterative coding:** in grounded theory, data coding are not finalised in one step, but it is an iterative process. To derive a context out of data, it must be refined and granulated to an acceptable level.
4. **Theoretical sampling:** grounded theory starts with theoretical sampling which can inform or predict the emergence of the next data to be collected.
5. **Management of preconceptions:** the researcher must not use preconceived ideas or theories about a phenomenon to drive the research in a certain direction.
6. **Inextricable link between data collection and analysis:** data collection and analysis cannot be done in isolation. Data are collected then analysed. Then, based on the analysis, new themes emerge and therefore new data might need to be collected and analysed. This is a recurrent process that cannot be decoupled.

A definition of grounded theory method, as explained by Birks *et al.* (2013:3), is a study undertaken to build theory from data. Researchers doing a research using grounded theory are encouraged to constantly review their research against the above-mentioned criteria to make sure they can justify that the approach used is grounded theory. For this study, the researcher applies these to ensure quality and rigorous research. She reflects on these criteria in the conclusion chapter. According to Charmaz (2014:15), grounded theorists use different strategies for their research, but what makes a research a grounded theory study lies in how the researcher conducts their research. The following are the nine actions suggested by Charmaz (2014:15) that each and every grounded theory researcher must follow:

1. “Conduct data collection and analysis simultaneously in an iterative process.”
2. “Analyse actions and processes rather than themes and structures.”
3. “User comparative methods.”
4. “Draw on ‘data (e.g. narrative and description) in service of developing new conceptual categories.”
5. “Develop inductive abstract analytic categories through systematic data analysis.”
6. “Emphasise theory construction rather than description or application of current theories.”
7. “Engage in theoretical sampling.”
8. “Search for variation in the studied categories or process.”
9. “Pursue developing a category rather than covering a specific empirical topic.”

Willig (2013:73) explains that there are two versions of grounded theory, namely the full version and the abbreviated version. According to Willig (2013:73), the full version of grounded theory requires that the researcher collects data and analyse it through the initial open coding, use intermediate coding to establish the linkages between categories and go back to the field to collect more data. The researcher can refine and change questions based on the emerging theory from the data. The researcher continues with the collection of data until saturation is reached. Participants can be interviewed more than once. The abbreviated version of grounded theory works only with the original data collected from the participants through one set of interviews. The researcher does not go back to the field to collect more data. However, the original data is analysed using the principles of grounded theory. All the phases of coding (i.e. open, intermediate and advanced) and constant comparison is followed for the analysis of data. Data saturation is reached within the original data collected. For this study, the researcher employed the abbreviated version of grounded theory for data collection and analysis.

2.4.5 Interpretivist methodology suitable for this study

The methodology suitable for this study is grounded theory. This study involves researching the understanding of the intended use, from the perspective of employees from a specific company that interact with KMSs. The aim is not only to understand their behaviour, but also to explain why they act in a particular manner. The interpretation of the results from the empirical work guides the development of the guidelines. The guidelines are developed with

the aim of enhancing the understanding of the intended use of KMSs to improve the use thereof. Somekh and Lewin (2011:116) state that “the most valuable aspect of grounded theory methodology is its ability to generate concepts grounded in data, thereby providing the stepping stone upon which to build knowledge and framework to guide practice.”

The research involves users who have their own individual perceptions, experience, history and capabilities around KMSs hence the use of grounded theory. Lived experience of participants provide rich data for grounded theory research, as participants are able to convey their experience and also explain the meanings associated with the experience to the researcher. Somekh and Lewin (2011:116) states that the strength of grounded theory is to “explain not only how persons experience things and the meaning that they give to events but also why and how people act/interact/emote in response to their experience and given meanings.” The application of grounded theory is discussed in detail in Chapter 5, which also explains the empirical work as it was done.

2.5 DATA COLLECTION METHODS

For any type of research, quantitative, qualitative or mixed types of data may be collected. The credibility of any research is determined by the relevance, substance, scope and depth of data collected (Birks & Mills, 2015:65). Different data collection methods or techniques are used to collect data. To understand the type of data generated by this research, different types of data are discussed next.

2.5.1 Data types

The three types of data that can be collected in a research are: quantitative, qualitative and mixed type. The three types of data are explained in detailed below.

1. **Quantitative data:** According to Oates (2008:245), “quantitative data means data, or evidence, based on numbers.” Quantitative data are objective but Olivier (2004:111) argues that “quantitative research is not always as objective as it has been touted as being.” Quantitative data that is also subjective can also be found.
2. **Qualitative data:** Oates (2008:267) explains that “qualitative data includes all non-numeric data- words, images, sounds and so on found in such things as interview tapes, researchers diaries, company documents, websites and developers models.” Qualitative

data might be subjective or objective. Qualitative data explores the how and why of system and human behaviour and what governs these behaviours.

3. **Mixed type data:** Mixed type data are defined by Teddlie and Tashakkori (2009:8) as “information that is represented in both narrative and numerical forms.” Some researchers require both types of data to be collected, each adding unique value to the research. It combines quantitative and qualitative methods.

The type of data collected for this study is qualitative because it focuses on understanding the perspective of the end-users in relation to the intended of KMSs. The researcher develops guidelines on how to improve the understanding of the end-users. Hennink *et al.* (2010:9) explains that “one of the main distinctive features of qualitative research is that the approach allows you to identify issues from the perspective of your study participants and understand the meanings and interpretations that they give to behaviour, events and objects.”

2.5.2 Methods of data collection

A method of data collection is simply a technique that is used to collect empirical research data. The six major methods of data collection are questionnaires, interviews, focus groups, tests, observation and secondary data (Johnson & Turner, 2003:298). In this study, the researcher discusses interviews, focus groups, field notes and memos, which are qualitative methods that are mostly used in grounded theory (Birks & Mills, 2015:72).

2.5.3 Field notes and memos

According to Birks and Mills (2015:75), “field work can include a broad range of data generation activities that includes observation and informal conversations, in addition to formal interviews.” Observations focus on gathering data by observing the behaviour of people, objects or animals (Walliman, 2011:101). The observer must study the activities that people are involved in and their behaviour or reaction. Observation is very powerful as it does not depend on participants to provide answers, but answers are found in the actions they do, keeping in mind that often what people say it is not necessarily what they do or mean. It is unobtrusive as it does not directly engage people and the people do not have to know that they are being observed as some people might act in a certain way the moment they know they are

being observed. However Hutchinson (1986:52) explains that “observing, by itself, is never enough because it begs mis-interpretation.”

Fieldnotes is another way of recording what you observe in the field. Fieldnotes must be recorded immediately after the interview to maintain accuracy of the actions. According to Birks and Mills (2015:67), “fieldnotes should be made after you conduct interviews to retain details of the physical environment, to record your immediate responses to the interaction and to capture participants non-verbal behaviour that will not be revealed through transcript.” Birks and Mills (2015:40) explain that “memos provide a series of snapshots that chronicle your study experience and the internal dialogue that is essential when conducting any research, particularly that with an interpretivist component.” Memos are used to map the sequence of activities you undertake during the research and provides audit trail of what has been done and why it has been done.

2.5.4 Interviews

Interviews are based on questions that the interviewer poses to the interviewee. The questions are open-ended and allows for the researcher to judge the quality of the answers. One of the advantages of interviews is that the interviewer interacts with the interviewee and can judge if the question is properly understood and rephrase the question where necessary (Walliman, 2011:100). Follow-up questions can also clarify some vague answers. Nonverbal as well as verbal reaction are taken into consideration by the interviewee. Interviews can be done with individuals or in groups. The interviews can be carried out in different ways, for example, online chat, telephonically, face to face, video conferences etc. The use of technology is encouraged where it not easy to meet face to face. There are three types of interviews which are: unstructured, semi-structured and structured interviews.

1. **Unstructured interview:** question can be changed anytime, and the interviewer can decide to ask or not ask some questions to the interviewee.
2. **Semi-structured:** there is some structure to a set of questions but how questions are asked is flexible. Follow-up questions can also be asked.
3. **Structured:** The researcher prepares a set of questions which will be asked to the interviewees without any deviations. The order of the questions must be followed for each interviewee.

2.5.5 Focus groups

A focus group is explained by Yin (2015:336) as “a form of data collection whereby the researcher convenes a small group of people having similar attributes, experience or focus area and leads a group in a nondirective manners.” A nondirective manner means that the researcher allows the group with similar interest to direct the questions to each other and therefore providing rich data as they all understand the subject very well. Focus groups focuses on how the people involved interact with each other. The group members interact by responding to each other’s questions. When conducting a focus group meeting, the researcher must be aware of different personalities. The researcher might not be able to get rich data from those participants that are introvert as they might not actively interact with other group members due to their personalities.

2.5.6 Data collection method suitable for this study

The study entails the understanding of the intended use of KMSs from the perspective of the end-users in order to develop guidelines to improve the use thereof. So, the suitable data collection method selected for the study is semi-structured interviews. According to Hutchinson (1986:52), “Interviews permit researchers to verify, clarify, or alter what they thought happened, to achieve a full understanding of an incident and to take into account the "lived" experience of participants.” The researcher prepares a set of questions and each interviewee is asked the same questions. For this study, employees were interviewed individually to get insight of how they use, see or perceive KMSs. Interviews were conducted face to face. The type of data collected were qualitative data from the transcript of interviews. Answers to questions were verbal and written down by the researcher in text format.

2.6 DATA ANALYSIS

Regardless of the type of data collected, it must be analysed by means of a specific methods or processes. Data must not only be analysed, but also presented or reported in such a way that the reader benefits from the content. Figure 2.2, taken from Straus and Corbin (1998:8), shows the interrelationship between data collection and analysis. From the figure, it clearly shows that data collection and analysis is a cyclical process. New themes are discovered during analysis and as a result, prompt the researcher to go back and forth between data collection and analysis. Grounded theory supports this notion as it is an iterative process. Its iterative nature is seen in the evolution of data during data collection and analysis. Concurrent data collection or generation and analysis using codes and categories is one of the essential methods that differentiates grounded theory from other qualitative research designs.

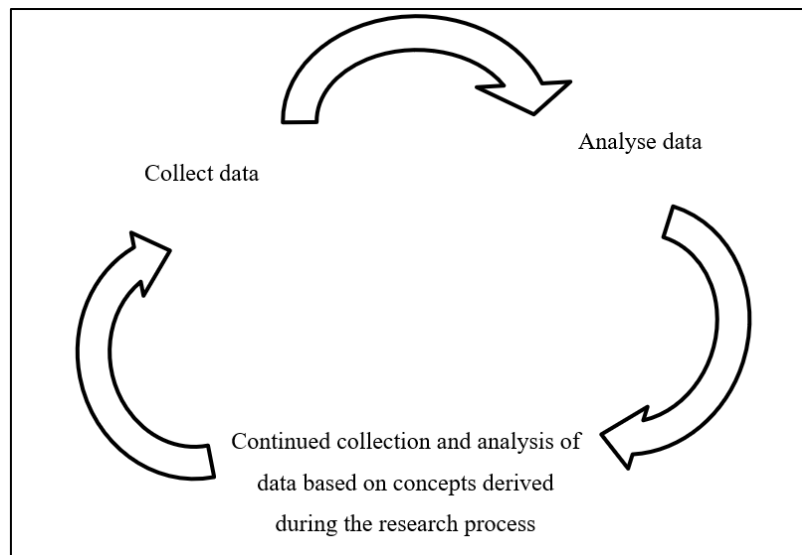


Figure 2.2: Interrelationship between data collection and analysis (Straus & Corbin, 1998:8)

The data collected for this study were qualitative data, using qualitative methods. Yin (2015:185) explains that the analysis of qualitative data are done through five phases. The phases follow a linear approach but they are iterative meaning that going back and forth between phases will happen when new themes are discovered (Hennink *et al.*, 2010:208). The five phases that were used in this study are:

1. Compiling: arranging notes collected during data collection in order. Once all data are formally arranged, it can be considered a database.

2. Disassembling: disassembling involves the breaking of compiled data into small components thereby allowing for the assignments of codes or labels.
3. Reassembling (and array): reassembling refers to ordering related data based on common themes and reorganise the fragment or pieces into different grouping and sequence. Tables or lists can be used to group or sequence data.
4. Interpreting: interpreting uses the reassembled data to create new narrative with tables and diagrams where necessary to make sense of the data. This is where a researcher presents the findings.
5. Concluding: conclusion is based on all phases. Once data are interpreted, meaningful information comes to the fore and therefore conclusion can be drawn from the information and meaning thereof. Conclusion in this study will include the final guidelines of how to improve the use of KM systems from the end user's perspective.

2.7 CODING

Data analysis is an iterative process that involves data collection, coding and analysis. Data coding is a vital part of analysis as it links the data collection and analysis. Coding allows the researcher to understand what the data means. Data must be broken down to a level that can be coded, meaning that high level data must be broken down into small pieces of information and arranged into categories. Coding refers to the process of analysing data. Codes are referred to as “a form of shorthand that researchers repeatedly use to identify conceptual reoccurrence and similarities in the patterns in the data” (Birks & Mills, 2015:89). It can be an ISue, topic, idea or opinion (Hennink *et al.*, 2010:216).

There are three coding phases in grounded theory: a) initial b) intermediate and c) advanced. The phases are not followed in a linear fashion, but they can be applied iteratively. The three phases are shown in Table 2.6 below, taken from Birks and Mills (2015:91). The table also shows the different terms used by grounded theorists. For this study, the terms used are: initial, intermediate and advanced coding. Coding for this study followed the initial, intermediate and advanced coding.

Table 2.6: Three phases of coding (Birks & Mills, 2015:91)

	Initial coding	Intermediate coding	Advanced coding
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Other terms	Coding and comparing of incidents, open coding	Integrated categories and properties, selective coding, axial coding, focused coding	Delimitating the theory, theoretical coding, selective coding
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2.7.1 Initial Coding

Initial coding is the first step in analysing data in grounded theory. It involves analysing the data word-by word, line by line and incident by incident (Charmaz, 2014:133). Words are also grouped together and labelled accordingly. In this stage, codes are developed until categories begin to form. It is referred to as open coding because all data are taken into consideration.

2.7.2 Intermediate coding

Intermediate coding follows from initial coding. Only core variables are coded and it is not as open as the initial coding but selective. The selected codes are then grouped together to form categories. Categories may contain a number of subcategories. All categories and their subcategories are linked together and compared with each other to understand how they are related.

2.7.3 Advanced coding

Advanced coding is referred to as theoretical coding by some grounded theorists. It follows the intermediate phase. The purpose of this phase is to “move your analytical story in a theoretical direction” (Charmaz, 2014:150). The data are theorised through in this phase. Theoretical codes if used correctly, can add precision and clarity in the final product (Charmaz, 2014:151). According to Birks and Mills (2015:119), “without theoretical coding, a grounded theory will struggle to demonstrate the explanatory power that distinguishes this approach to research.”

2.8 INTERVIEW QUESTIONS

Intended use is part of the “external variable which could be implied in the system features, training, documentation, and user support.” (Chau, 1996:187) The aim of this study was not to measure system usage. The study rather focused on uncovering whether end-users understand the intended use of KMSs. This could be investigated in two ways: a) data gathered from the actual usage or b) data gathered from question related to external variables. For this study, the

researcher is not investigating the computer recorded system usage but the understanding of intended use from the perspective of the end-users focusing mainly on the external variables. The research questions were influenced by the characteristics of external variables such as spirit and faithfulness of appropriation as explained in Chapter 3.

The research questions were divided into four sections. The first section is demographic data. The second section focuses on the understanding of the subjective or internal spirit as interpreted by the end user. The intention of the third section is to gather data based on the lived experience. The last section seeks to learn more about the understating and use of the support structures from the perspective of the end-users. The questions used for the interview with the motivation behind each question is presented next.

2.8.1 Interview questions section 1: demographic information

Table 2.7 below shows the questions related to the demographics of participants. The purpose of demographic questions is to collect data that assists the researcher in understanding the profile of each participant. Diverse population allows the researcher to collect quality rich data that covers as many dimensions related to the study as possible.

Table 2.7: Demographic questions

Section 1: Demographic questions	
1.	What level is your current position?
2.	How long have you been using SharePoint?

2.8.2 Interview questions section 2: subjective or internal spirit

Table 2.8 below shows questions related to subjective or internal spirit on how the participants view and understand SharePoint and its intended purpose.

Table 2.8: Subjective or internal spirit

Section 2: Subjective or internal spirit	
Question	Purpose of the question
3. What is your main purpose for using SharePoint?	To understand if the participants knows why they are using SharePoint

Section 2: Subjective or internal spirit	
Question	Purpose of the question
4. When requirements are gathered, to what extend are you involved?	To know if end-users are given an opportunity to contribute in the requirements gathering stage
5. Would you like to be more or less involved with requirements gathering?	To understand whether end-users are interested in contributing to the requirements of a system
6. Substantiate your answer in question 5	To understand the reason behind the answer given in question three
7. What is your understanding of the aim and objective of SharePoint	To know if the participants understanding is in line with the aim and objectives of the system

2.8.3 Interview questions section 3: lived experience.

Table 2.9 below shows the questions related to the lived experience of the users. Lived experience is an integral part of grounded theory as the “theory is grounded when it emerges from and generates explanations of relationships and events that reflect the life experiences of those people and processes that the researcher is attempting to understand.”(Lawrence & Tar, 2013:31).

Table 2.9: Lived experience

Section 3: Lived experience	
Question	Purpose of the question
8. Please describe how using SharePoint impact your day to day job?	To know if the user find value in using the system
9. What do you like most about SharePoint?	To understand if there is anything the user find valuable on the system
10. What would you change about SharePoint?	To find out if there are changes the user would like to see

2.8.4 Interview questions section 4: support structure

The section seeks to understand the support systems and tools that are made available to the users. Systems and tools enable employees to continually engage and use the systems. Table 2.10 below details the questions related to the support structure.

Table 2.10: Support structure

Section 3: Support structure	
Question	Purpose of the question
11. What type of training did you receive for using SharePoint?	To understand if the user was inducted on the system
12. Describe the value add of the training you received?	To know if the induction was of value or not
13. Explain what you do when you need help with the system.	To understand if the user knows of any available channels, he/she can use for help

2.9 PARTICIPANTS SELECTION

Participants for this research were employees of a specific company. The employees were from different departments and because the study focused on the use of KM system, all participants were employees who were in positions that required extensive use of KM systems. Employees from functional departments were the subject of the study. Functional departments were chosen because “grounded theory relies on theoretical sampling, which involves recruiting participants with differing experiences of the phenomenon so as to explore multiple dimensions of the social processes under study.” (Starks & Brown Trinidad, 2007:1375) The departments include information management (IM), Finance, Human Resources (HR) and Supply Chain (SC). Employees in different positions were interviewed for this research. Positions included: middle management, Senior specialists, specialists and administrators. The reason for choosing supporting departments was due to the nature of the work they do. Their work are inputs into other departments and knowledge management is key as their outputs must be accessible by all employees. Morse (2010:232) explains that, an excellent participant is the one who have been through the experience and therefore have information you need for the subject under study. It is explained in more detail in Chapter 5.

2.10 SUMMARY

Research paradigms are discussed first in this chapter because “without nominating a paradigm as the first step, there is no basis for subsequent choices regarding methodology, methods, literature or research design.” (Mackenzie & Knipe, 2006:2) The research paradigm discussion is based on the ontology, epistemology, methodology and methods for each paradigm.

The interpretivist paradigm was chosen for this study on the basis that the research was done in a social context where reality is constructed by those who are involved. The researcher sought to understand the intended use of KMSs from the perspective of the end-users to improve usage thereof. The main aim was to introduce guidelines that will improve the use of KMSs. Because the choice of paradigm informs the methodology, the interpretivist research methodology chosen for the study was grounded theory. Grounded theory was chosen because the researcher’s aim was not only to understand but to explain the phenomena being studied from the perspective and in the context of those who experience it. Birks and Mills (2015:148) explain that “rarely is grounded theory generated to produce knowledge for the sake of knowledge alone. Theories constructed through the use of grounded theory methods aim to provide understanding of a phenomenon that will ultimately inform practice in a given discipline.” The guidelines were developed from the data collected from the participants. The type of data collected from participants were qualitative data. The method of data collection was semi-structured interviews whereby the participants were asked same questions in a similar manner to gain understanding and explain their behaviour. Data was analysed using the five phases of analysing qualitative data, taking into consideration the underlying principle of grounded theory that influences the analysis of qualitative data. Data gathering and analyses are discussed in Chapter 5.

CHAPTER 3: INTENDED USE OF INFORMATION SYSTEMS

3.1 INTRODUCTION

The aim of this study was to understand the perspective of end-users regarding the intended use of knowledge management systems (KMSs) that they use, to develop and propose guidelines for improved use, i.e. as intended. Seddon (1997:242) explains that heavily used systems do not imply that the systems are successful. Extensive use of a system does not mean the system is being used as intended. While measuring system use is beneficial, some systems are subjected to abuse and the results obtained from measuring system use may be misleading.

This chapter starts by giving an overview of what information systems (IS) are and where they fit into the overall strategy of the business. The strategic planning process of IS is explained. The researcher explores the process followed to develop and implement IS, starting from when a need arises, until the system is introduced and used by end-users. The reason for investigating the development life cycle, is to gain an understanding of the extent to which the intended use of a system is part of the development life cycle. Intended use also implies reaching of predefined business objectives. According to Remenyi and Sherwood-Smith (1998:82), “business objectives of the information system investment are either substantially or even completely lost sight of, forgotten, and/or ignored, during the process of the development of the information system.”

Systems are used by end-users, hence, end-users form an integral part of the stakeholder group of any IS. End-users can potentially make the system a success or failure. IS are not implemented without a requirement or need for them, they are introduced into an organisation for a reason. The reason is often understood and supported by stakeholders other than the end-users. End-users do not necessarily understand the intentions of these stakeholders and the rationale for acquiring the systems. Yet, the success of IS lies in the system being used for what it is intended for, by the end-users. So, the involvement of end-users is investigated to gain an understanding of the extent to which end-users are included in the introduction and development of IS. Joshi (1991:231) says “[u]sers who participate in the implementation of the new technology are likely to feel that they should also share fairly in the benefits generated on account of users' and employer's collaborative effort in introducing the new system or

technology.” In this chapter, system use (usage) is explained in detail, followed by intended use of information systems.

Measurement of system use (usage) is investigated and compared to traditional measuring of extent of use. Extent of use traditionally focuses on measures such as how many transactions have been processed and how much time is spent by end-users using the system, regardless of what transactions were executed and how these transactions were affected. According to Burton-Jones and Straub Jr (2006:229), some of these traditional measures include “features used, tasks supported, extent of use, use or non-use, heavy or light use, frequency of use and duration.” Intended use is another aspect of measuring the use of a system, which is often omitted. In this study, intended use refers to the intent of the system’s functionalities and features, referring specifically to the activities/processes that the system support and enable. The main and most important factor indicating intended use is thus understanding of the purpose of each functionality and all features in a system. Traditional models used to measure information system use such as the technology acceptance model (TAM), the theory of reasoned action (TRA), the theory of planned behaviour (TPB) and DeLone and McLean’s model of IS success are explored in this chapter, with the aim of understanding the difference between measuring usage and understanding intended use. A successful system implies that the system is being used for what is intended for. Benefits realisation is another factor that is used as an indicator of whether a system is being used for what it is intended for, or not. If intended benefits of using a system are realised, then the system can be deemed a success and therefore it can be accepted that the system is used as intended. DeLone and McLean (2003:27) say “usage measures should capture the richness of use as a system phenomenon including the nature, level, and appropriateness of use, and should not simply measure the frequency of use.” So, the manners in which organisations track and report the benefits of IS are also investigated.

This chapter is organised as follows: Section 3.1 is the introduction to the chapter. Section 3.2 discusses what IS are. Section 3.3 outlines the strategic planning of IS. System development life cycle (SDLC) is explained in Section 3.4. Section 3.5 explores the role played by end-users in IS. Section 3.6 explains use of IS. Section 3.8 presents the intended use of IS. Section 3.8 presents the usage measuring tools of IS. Section 3.9 outlines benefits realisation in the context of IS. Section 3.10 presents the approaches for measuring system usage. The chapter is concluded with a summary in Section 3.11.

3.2 WHAT ARE INFORMATION SYSTEMS

The term IT and IS are often used interchangeably by writers. According to Grant *et al.* (2010:104), there is a difference between IT and IS. IS are viewed as those procedures which function is to collect, process, store and communicate, to support the activities of an enterprise. Pearlson and Saunders (2009:15) define IS as the combination of technology, people and processes that an organisation uses to create and manage information. The definition of IT, as explained by Grant *et al.* (2010:104), is that it is the microprocessor-based technologies used to store, process, recall and transfer information that may form part of a network, while Pearlson and Saunders (2009:16) define IT as all forms of technology used to create, store, exchange and use information. The researcher's view is that, the definitions of IS and IT are not mutually exclusive. Both refer to the collection, processing, storing and exchanging of information, hence they are used interchangeably and complementary. IT and IS are interdependent, as the systems are incomplete without the technology and the technology is inadequate without the systems.

For this study, IT or IS refer to a complete functional system that has been developed to meet a specific business need. The system is developed for and used by the end-users. End-users have an important role to play, as the information that is collected, created, processed and stored in the systems exist because of the end-users and for the end-users. They are the ones that interact with the system. According to Pearlson and Saunders (2009:15), IS comprise of three main elements: technology, people and processes. IS are an essential part of most modern organisations. Hence, organisations have departments solely dedicated to deliver the IS mandate of the business. IS departments are similar to any other support department in the business; they are required to have a strategy and a plan on how they will contribute to the success of the business. The choice of technologies and systems depends on the business strategy. The strategic planning process for IS departments are explained next in order to understand the process of arriving at a decision to either invest or not invest in (specific) IS.

3.3 STRATEGIC PLANNING FOR INFORMATION SYSTEMS

IS are developed to support business processes, procedures and policies. Systems can be developed to assist employees with decision making, as well as to automate, enhance or improve the operations of a business. According to Alavi and Leidner (2001:4), IS have

evolved from having systems that are used for processing and disseminating large amounts of information, to systems that are used by managers to support and enable decision making, to systems that provide real time information for executive decisions. The need for IS ought to always be in line with the overall goals of the business. Organisations do not invest in IS that do not support the business goals. Introduction of new systems or technologies in organisations are of strategic importance. Cash Jr and McLeod (1985:5) explain that the primary focus of computer and communication technology applications in most companies has shifted from efficiency or process improvement, to strategic and competitive use.

An IS strategy is devised based on the business strategy. An IS strategy is defined by Cash Jr and McLeod (1985:17) as the “firms overall commitment to the exploitation of IS technology for competitive business.” The introduction of any IS must thus be strategically planned. The goals of IS are three-fold: they must be aligned to business goals, they must be of competitive nature and there must be value derived from the system. How systems are introduced in the business is crucial and requires extensive and meticulous planning. According to Davis (1985:8), variables such as “choice of system characteristics, choice of development process, choice of implementation strategy and nature of the support service provided” must be taken into consideration in order to fully understand what it takes to make a system a success.

Strategic information systems planning (SISP) is at the heart of many organisations (Earl, 1993:1). According to Earl (1993:1), SISP must include the following areas:

1. “Aligning investment in IS with business goals.”
2. “Exploiting IT for competitive advantage.”
3. “Directing efficient and effective management of IS resources.”
4. “Developing technology policies and architectures.”

There are different ways to acquire IS. Systems may be developed in-house, purchased off-the-shelf or, in some cases, developed specifically for the company by a third-party vendor. How systems are acquired is part of the overall strategy and based on the nature of the business. For many organisations where the core business is not in the development of IS, they outsource the development of IS to those companies whose core business is systems development. Some systems, in these non-IT organisations, are also bought off-the-shelf and customised to fit the business need. Customisation is very important and aspects such as company policies,

procedures and culture must be taken into consideration (Raza & Standing, 2010:118). Other systems are bespoke, that is, they are specifically designed and developed, based on business requirements. Cash Jr and McLeod (1985:17) explain that, based on how mature the business is in relation to technology, a business can fall in one of the following three categories:

1. “Innovators – first to introduce new competitive use of IS technology.”
2. “Early adopter.”
3. “Effective or efficient followers.”

Companies in the innovator category are those whose core business is to develop IS and technology. They have research and development functions to investigate innovative ways of introducing new IS and technologies. Early adopters often follow the innovators very closely and as soon as a new technology is introduced, they adopt it and, therefore, may get a competitive advantage over the followers. Followers wait for a technology to be mature and carefully consider whether to adopt the technology or not. Companies in this category find themselves having to play catch-up, because by the time they decide to deploy a certain technology, the technology may have advanced and they acquire old technology. Even though it is ideal to be a follower, the company must tread very carefully and be an effective and efficient follower. The decision on the direction the company follows in this regard is strategically taken by senior executives. The decision cascades down to the type of systems acquired and the way in which systems are implemented. Although these decisions are taken by executives, user buy-in is another important factor that contributes to the success of the system. Executive support is important, but it cannot drive success on its own. User acceptance and use by end-users, as intended, is also crucial.

A plan detailing the type of projects to be undertaken to support the business goals follows the approval of the IS strategy. It is generally accepted that one of the key factors for successful IS planning is close linkage between the IS strategy and business strategy (Segars & Grover, 1999:204). In most cases, the strategic plan includes only the high-level requirements and does not prescribe the technology that must be used. From the high-level requirements, detailed requirements are documented; it forms a base for the development of the systems. For a system to be developed, a SDLC is followed. The cycle through which IS are developed is explained next, looking at a holistic framework from a project management perspective.

3.4 INFORMATION SYSTEM DEVELOPMENT CYCLE

The manner in which systems are developed and introduced to users has a huge impact on the adoption and usage of the system. As explained by Adams *et al.* (1992:229), for any given implementation, “there may be specific advantages or disadvantages that do not relate to the underlying characteristic of the technology but rather to implementation specific characteristics such as training, support, user involvement, user expectations, or design characteristics.” Requirements gathering and understanding of the requirements are important steps for any system being developed. System development is solely based on the requirements, as outlined by the stakeholders. So, a need (of stakeholders) exists before requirements are gathered. Stakeholder involvement (including end-user involvement) is crucial in ensuring that the aim and objectives are understood. Stakeholders must be identified very early and their roles and involvement must be clearly defined (Raza & Standing, 2010:120).

System development is a complex subject, as there are many ways to follow in developing and delivering systems. System development is based on a SDLC and systems are delivered as projects. It has phases that may vary from industry to industry. General, basic phases include “concept, development, implementation and support.” (Charvat, 2003:33) Phases are followed in order, but this does not mean that the whole project can be delivered in one iteration. There can be many iterations, delivering different sets of requirements. Projects can also be delivered in phases by grouping requirements together and deciding which requirements must be delivered first. How projects are delivered is determined by the project manager and approved by the project sponsor. The traditional IS development cycle, taken from Raza and Standing (2010:119), in Figure 3.1 shows the generic IS development process followed to deliver IS projects.

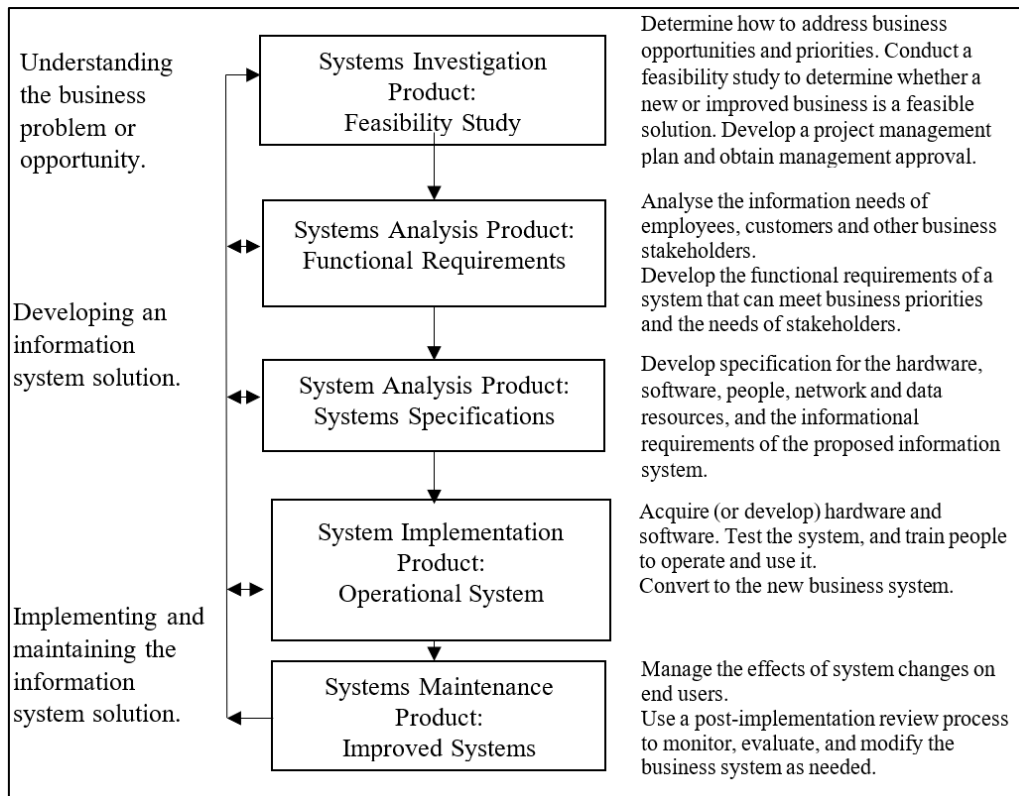


Figure 3.1: The traditional IS development cycle (Raza & Standing, 2010:119)

In the concept phase, the problem statement is defined, and opportunities are investigated. Before a system is designed, intended use is already implied by the proposed solution for the business problem and opportunities to solve it. Knowing the business problem and how the system will contribute to solving the problem, assists with the understanding of the intent of the system. Stakeholders ought to be involved very early in projects.

The details of the process to be followed to deliver an IS project is explained by means of a project management methodology. Organisations have specific methodologies that they subscribe to and some are even tailored to fit the business goals. The preferred project management methodology has an impact on the success of the project, but Špundak (2014:945) argues that a “methodology by itself is not sufficient or even necessary precondition for project success.” A methodology is defined by Charvat (2003:3) as “a set of guidelines or principles that can be tailored and applied to a specific situation.” In a project environment, these guidelines might be a list of things to do. According to Charvat (2003:3), a methodology could also be a “specific approach, templates, forms, and even checklist used over the project life cycle.” In most cases, the project manager is required to follow a specific project management

methodology when delivering a project. Although the project manager is responsible for the successful delivery of a project, other stakeholders also have important roles to play.

Stakeholder involvement is an essential part of any IS project. End-users form part of the stakeholder community. The study aims to understand the perspective of end-users regarding the intended use of knowledge management systems (KMSs) that they use, to develop and propose guidelines for improved use, i.e. as intended. The researcher argues that, throughout the project life cycle, users ought to be involved. End-user involvement in IS projects is discussed next.

3.5 END-USER INVOLVEMENT IN INFORMATION SYSTEMS

According to Pitt *et al.* (1995:176), the expressions of end-users on what they want, reveal their expectations and their perceptions of what they think they will receive. The importance of user involvement in system development has been researched and it is understood that users form part of the overall stakeholder community of any IS. End-users have a vested interest in the system, especially when the system has a direct impact on what they do and how they do it. End-users will always compare the individual benefit to the company benefit. It is likely that if a user believes the company has more to gain (than him/herself) by him/her using the system, then the system will not be used. The benefits must be equally shared and understood. Systems can even be boycotted if the users feels that a system is of no benefit to them (Joshi, 1991:232).

User involvement or participation must occur during all the phases of the SDLC. User participation in the development of a specific IS, is explained by Sabherwal *et al.* (2006:1852) as “the assignment, tasks, and behaviours that users, or their representatives, perform during the IS development (ISD) project, or the user’s psychological state of involvement in the project.” Figure 3.2, taken from Raza and Standing (2010:120), shows a critical systems thinking based (i.e. in favour of engagement of all involved and affected stakeholders) IS adoption model, using SDLC phases. The identification of stakeholders ought to happen right at the start of the project, as prescribed by the boundary technique. This will ensure that everyone knows the role they play in the project very early, to avoid confusions. It is possible to have different stakeholders for different phases of the project, so stakeholder identification is not a once-off activity, it must be done iteratively throughout the project.

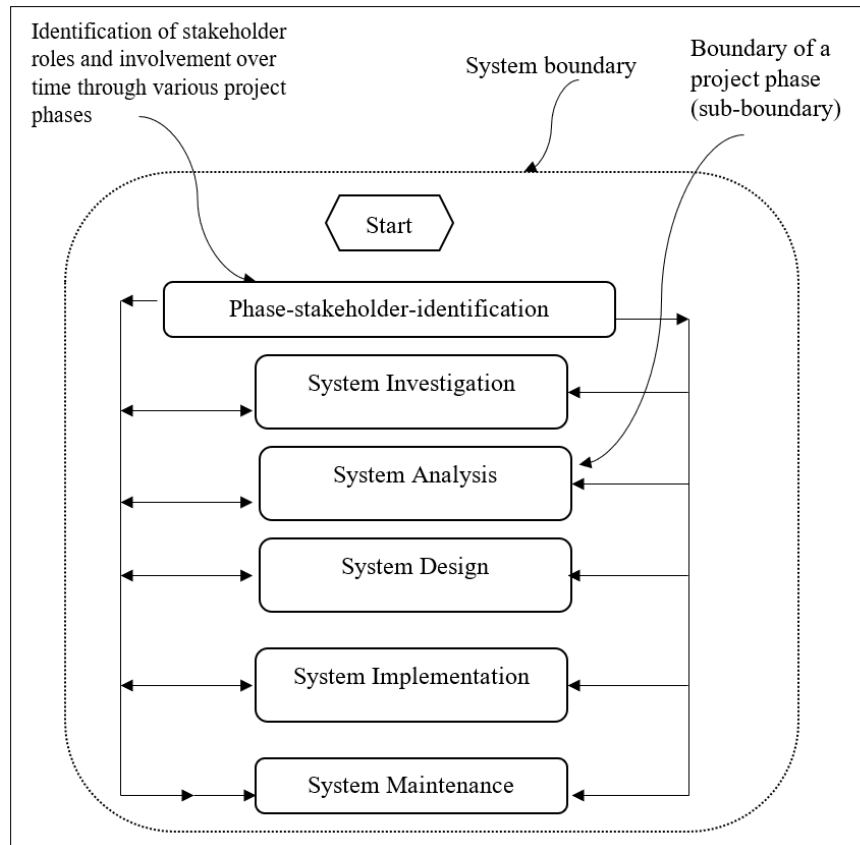


Figure 3.2: Critical systems thinking-based IS adoption model using SDLC phases (Raza & Standing, 2010:120)

End-users are key stakeholders, but it is not always practical to involve all end-users throughout the project, due to the large number of people involved. Some end-users might not be involved at the inception of the project, but the expectation is that all end-users that are required to use the system must understand why the system exists and what is expected from them. McKeen and Guimaraes (1997:147) explain that “users must decide what the system is supposed to do; developers must decide how best to accomplish this.”

It is not up to the developers to define and refine requirements. Raza and Standing (2010:117) say “It is quite critical to identify stakeholders and discover how IS adoption is looked at through the eyes of those involved in and/or affected by it.” Identifying the user community very early allows the development team to continuously involve users, from the development phase right to the end of the project. If users understand the goals and objective of the system and the output and benefits thereof, they are likely to support the use of the system and also be the change agents in advocating for the use of the system, as intended. The opposite is also true, if users don’t understand the objective of the system, they are likely to be change agents

in discouraging the use and support of the system. Users must clearly understand what is in it for them very early into the project.

The use of IS is not entirely dependent on the design, technical or benefits that is obtained from the system. The use of IS is very much linked to the user's beliefs and intentions around the system. Users decide to use, or not use, a system, based on many factors. The factors that affect the users' decision vary from the type of system, the impact on the individual users and the context (Mathieson, 1991:173). Understanding these issues assist with developing a system that can be acceptable to and effectively used by end-users. Hartwick and Barki (1994:443) state that "individuals who are active in the system development process are quite likely to develop beliefs that the system is both important and personally relevant, and the feeling that the system is good." Once a user accepts a system, it becomes easier for them and they want to know more about the system. Activities such as project briefings, system testing and training will be attended to. These enhance the users' understanding of the system. This is supported by the explanation given by Joshi (1991:231) that users tends to look at the benefits they stand to gain from the system: if they believe they have nothing to gain, then they might reject the changes that are brought about with the system. If users strongly believe the system will bring about a positive change, then they will support the change.

Systems are to be designed and developed with all the stakeholders in mind and therefore the developer must know the common characteristics of the end-users he/she is developing the system for. To understand this, the developer must interact with the users continuously. The need or problem statement must be understood and supported by the user, as IS success is viewed from the perspective of individual and collective users and not only from the perspectives of senior executives (Sabherwal *et al.*, 2006:1849). IS success is very much dependent on the system being used by the end-users. There are many factors that contributes to the success of the system, but if the system is not used as intended, then the system will not be deemed successful. Looking at usage alone is not adequate; a further step needs to be taken to investigate how much of this usage is in line with the aims and objective of the system. The difference between measuring IS usage autonomously and measuring system usage exclusively taking into consideration the intended use, is explained next.

3.6 INFORMATION SYSTEM USE

The use and usage of IS are directly linked to intended use. The online Oxford (2020) dictionary defines use as “the action of doing something or the state of being used for a purpose” while usage is defined as “the action of using something or the fact of being used.” In IS, system use and usage are used interchangeably, however, the purpose of this study is not only to understand the action taken in using a system, but also the taken actions in relation to the purpose of the system.

The definition of system use, as explained by He and King (2008:306), is that “system use refers to the extent to which users operate a system in their work settings. System use is often measured by the amount or frequency of system operations within a certain period of time.” Seddon (1997:246) further explains that “IS use might be measured in hands-on hours, hours spent analysing reports, frequency of use, number of users, or simply as a binary variable: use/non-use.” The two explanations above clearly shows that, the intent of the system is often not taken into consideration when measuring use. Seddon (1997:242) introduces the three meanings of IS use based on DeLone and McLean’s Model.

1. **“Meaning 1:** IS use as a variable that proxies for the benefits from use.” The success of the system depends on the system being used for its intended purpose. Use only does not determine success but success cannot be realised if the system is not used. Benefits must be derived from the use of the system.
2. **‘Meaning 2:** IS use as the dependant variable in a variance model for future use.” Current observed behaviour of users of a system can be used to influence future IS. Future improvements of IS are based on the behaviour of the current users of a system.
3. **“Meaning 3:** IS use as an event in a process leading to individual or organisational impact.” User satisfaction, individual impact and organisational impact are factors that are taken into consideration when the success of IS is evaluated.

The three meanings reveal that IS use has many characteristics and each characteristic is different as it exists to serve a specific purpose. When measuring system use, it is very important not to neglect any area that contributes to the use of the system.

According to Burton-Jones and Straub Jr (2006:231), “the IS field has no generally accepted definition of system usage.” System usage is described by Burton-Jones and Straub Jr (2006:231) as “an activity that involves three elements: (1) a user, i.e., the subject using the IS, (2) a system, i.e., the object being used, and (3) a task, i.e., the function being performed.” System usage is measured; it is not evaluated. Straub *et al.* (1995:1382) define system usage as “the utilisation of information technology (IT) by individuals, groups or organisations.” For this study, utilisation does not only refer to the number of transactions performed, but the task, as well as the outcome of the task being performed. Tracking and reporting on the number of transactions alone is not sufficient.

The terms system use and usage are used interchangeably in this study to refer to the action of using a system for its intended purpose. Intended use of IS is discussed next.

3.7 INTENDED USE OF INFORMATION SYSTEMS

Intended use or, as sometimes referred to as appropriate use, is not associated with how much the technology has been adopted by the individual, but how the system is used and whether the benefits of using the system are realised. Thus, classical factors that affect the adoption and system success, such as perceived ease of use or perceived usefulness, can be factors that are directly linked to the success of the system. A user may be perfectly comfortable in using a system and may have fully adopted it, but he or she may still not use the system as intended (Chin *et al.*, 1997:363). According to DeLone and McLean (2003:21), “[s]ystem use is clearly a key variable in understanding IS success; but, too frequently, simple usage variables are used to measure this complex construct.”

Intended use cannot be measured by how much the system is being used, but rather by whether the system usage is in line with the aim and objectives of the system. Clark *et al.* (2007:581) mention that “linear model suggests that use leads to some impact or net benefits, but is not specific about what they might be and more importantly the effects of increased benefits on subsequent system behaviour.” Simply saying that more use will yield more benefits, without considering the nature of this use, is clearly insufficient. The nature, extent, quality, and appropriateness of the system use and usage contribute to the success of the system. The nature of system use could be addressed by determining whether the full functionality of a system is being used for its intended purpose, or not.

DeLone and McLean (2003:16) explain that measuring the number of transactions performed does not properly capture the relationship between usage and the realisation of expected results. When a system is used as intended, the benefits of the system ought to be realised and may lead to the system declared successful. Various ways of measuring system use exist, and these are discussed next.

3.8 INFORMATION SYSTEMS USAGE MEASURES

According to Straub *et al.* (1995:1329), “the most common forms of system usage measures found in the literature are: (1) subjective, self-reported measures and (2) objective, computer-recorded measures.” Some of the models used to measure information system usage use both subjective and objective measures, while some advocate the use of one measure at a time. Both types of measures have their own advantages and disadvantages, based on what one wants to achieve. The following traditional models used to measure information system usage are discussed next: The Technology Acceptance Model (TAM), the Theory of Planned Behaviour (TPB), the Theory of Reasoned Action (TRA) and DeLone and McLean's model of IS success and benefits realisation (BR).

3.8.1 The Technology Acceptance Model

The TAM is a subjective model used to measure perceived usefulness, ease of use and usage of IS. TAM was introduced by Davis in 1985 as part of his PhD study. The objective of the model was to predict how successful an IS will be in terms of user acceptance, before it can be introduced to the whole community and after the implementation for improvement purposes. It is useful since acceptance of a technology is one of the factors that indicates the success of a system. It is imperative that the implementers of IS understand all the factors that, directly or indirectly, impact upon the successful development and implementation of IS. The conceptual model developed by Davis (1985:10), shown in Figure 3.3, shows that high or low usage does not just come about. There are many factors that contribute to the actual usage, such as system features and capabilities, as well as the user's motivation to use the system.

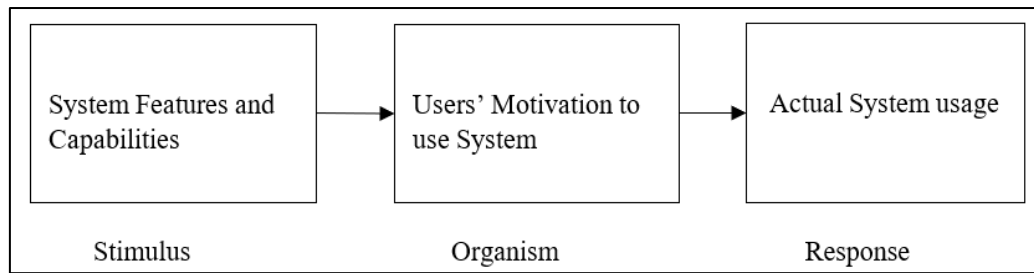


Figure 3.3: Conceptual framework (Davis, 1985:10)

Davis (1985:24) refined the conceptual framework; the original (first) depiction of TAM is shown in Figure 3.4.

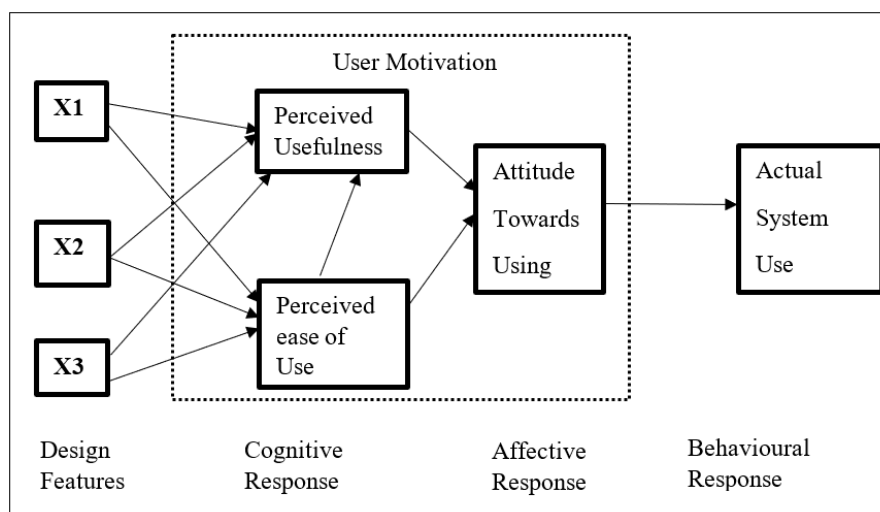


Figure 3.4: Original technology acceptance model (Davis, 1985:24)

The axes in the figure represent the design features of a system, according to Davis (1985:24). The way that a system was designed affects the adoption by the users indirectly. Hence, it is shown as an external factor. Internal factors that directly affect the actual usage are perceived usefulness and perceived ease of use that influence the user's attitude towards the system. Users are more likely to use a system if their perception is that it is easy to use and that there is value in using the system. TAM quickly became a popular model to measure actual usage of IS.

According to Szajna (1996:86), the original TAM was revised by Davis in 1989. The model, as shown in Figure 3.5, taken from Szajna (1996:87), was divided into two parts to indicate the effects of the model in terms of pre-implementation and also post-implementation.

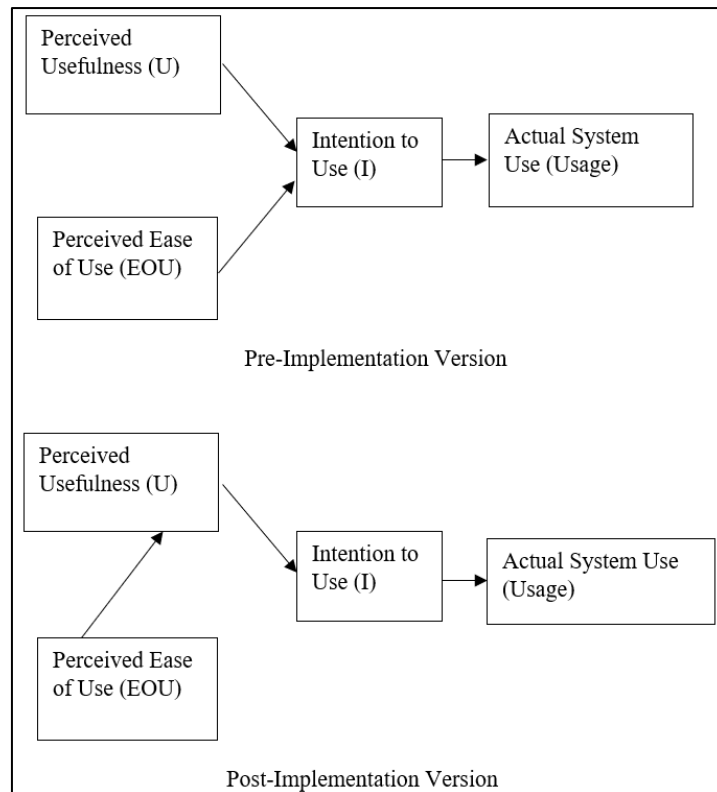


Figure 3.5: Revised technology acceptance model (Szajna, 1996:87)

Szajna (1996:87) says that the reason for dividing the model was to measure pre- and post-implementation separately. Perceived usefulness and ease of use pre-implementation differs from that of post-implementation. Pre-implementation, users form perceptions without having all the facts; once they start using a system, their perceptions change based on their actual interaction with the system. Measurements in terms of attitudes towards using a system was also omitted in the revised model. Since the model depicts pre- and post-implementation, attitude is not as relevant as it changes as time goes by and with experience and understanding of the system. TAM is a useful tool as it deals with issues affecting system use pre-implementation and post-implementation. However, TAM does not measure system use in relation to intended use. The factors considered are sufficient to measure usage, but measuring usage alone and without context of intended use is one of the shortcomings of TAM.

3.8.2 The Theory of Reasoned Action

Another contributing factor is social norm (SN) where intention to use a system is influenced by a user's perception regarding what the people of influence thinks. According to Mathieson (1991:175), "SN is the individual's perception of social pressure to perform the behaviour."

People of influence play an important role on behavioural intention if a user believes that using the system, or not using the system, will impact upon the opinion that a person of influence have about them, they are likely to do what they think will please the person of influence. An example given by Mathieson (1991:178) is that “an individual might perceive pressure from his or her supervisor to use a system, with an implied outcome of non-use being a poor performance evaluation.”

The TRA model, shown in Figure 3.6 as taken from Davis *et al.* (1998:984), evaluates the behaviour and factors that influence the behaviour of the user towards the system.

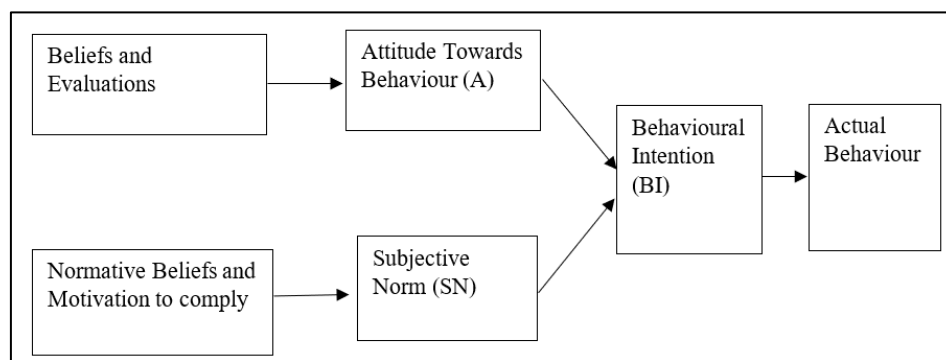


Figure 3.6: Theory of Reasoned Action (TRA) (Davis *et al.*, 1989:984)

The TRA model does not evaluate the actual system’s design and features. The model seeks to proactively address the underlying issues that affect system use before they materialise. The model can be used to investigate if the users of a system understand and support the aim and objective of the system before it is implemented. However, the model does not address the actual usage of the system as intended.

3.8.3 The Theory of Planned Behaviour

The TPB is based on the TRA model; it seeks to investigate the external factors that influence the use of a system from the perspective of the end-users. The TPB model is similar to the TRA however TPB has one more social factor which is the perceived behavioural control (PBC). it does not take into consideration the actual system and its technicalities but the social variables that influences the intention to use a system (Mathieson, 1991:173). Figure 3.7 shows the TPB model, taken from Mathieson (1991:175).

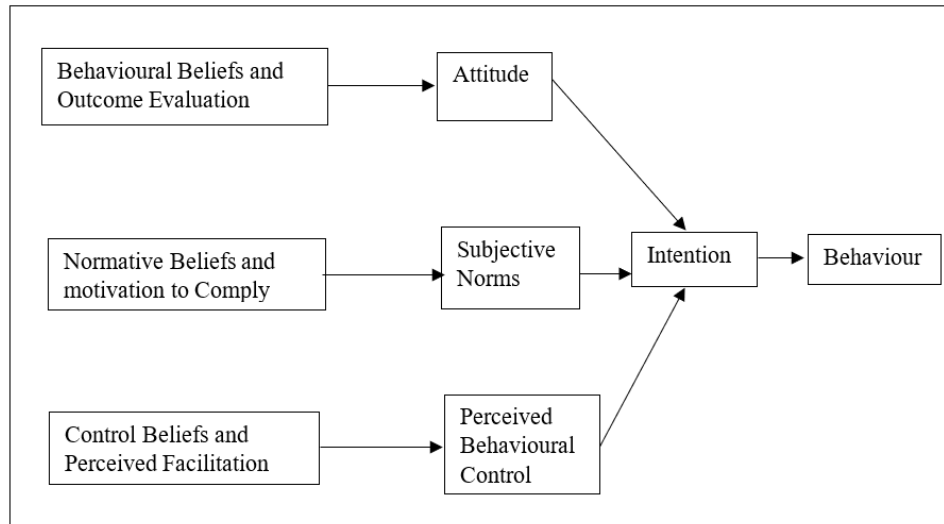


Figure 3.7: Theory of Planned Behaviour (TPB) (Mathieson, 1991:175)

Mathieson (1991:175) states that “PBC is the individual's perception of his or her control over performance of the behaviour.” The model focuses more on the users and what they think they can, or cannot, do with the system. There are many types of users; some users are computer literate while others are not. If users think they cannot use the system (due to for example computer illiteracy), the issue must be addressed very early during development. Sufficient support and resources must be invested to ensure that users can perform their duties. Users will always assess the importance of the resources needed to carry out a particular action. For a user to act and perform a certain task, the task must be deemed important from the users’ perspective and support and resources must be readily available (Chang, 1998:1827). TPB can be used to understand the intended behaviour of users in relation to the use of a system.

3.8.4 DeLone and McLean's model of IS success

Measuring IS success is very broad and can be approached from many different levels, depending on what the researcher aims to achieve. IS success is very closely linked to system use; a system that is not used cannot be deemed successful, regardless of how good the system is. DeLone and McLean’s model of IS success was developed by William H. DeLone and Ephraim R. McLean in 1992. The objective of it was to introduce six categories to measure IS success, i.e. “system -quality, information quality, use, user satisfaction, individual impact and organisational impact” (DeLone & McLean, 1992:60). The success of IS can be measured at different levels including the “technical, semantic, and effectiveness level” (DeLone &

McLean, 1992:60). Shannon and Weaver (1964:4) defined the technical level as “[h]ow accurately can the symbols of communication be transmitted?” the semantic level as “How precisely do the transmitted symbols convey the desired meaning?” and the effectiveness level as the “How effectively does the received meaning affect conduct in the desired way?” DeLone and McLean (2003:10) mention that although the definition of the different levels of success measures were introduced decades ago, they are still relevant and valid today. Figure 3.8, taken from DeLone and McLean (1992:87), shows DeLone and McLean’s model of IS success.

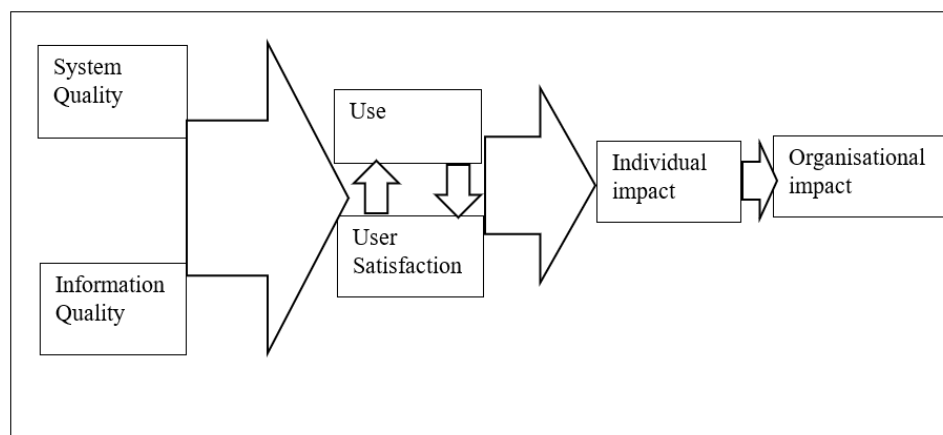


Figure 3.8: DeLone and McLeans’s Model of IS Success (DeLone & McLean, 1992:87)

The model is made up of the six categories used to measure the IS success. The categories are arranged to show the interdependence to each other. DeLone and McLean (1992:83) explain that the quality of the system and the information the systems generates, affect the satisfaction level of the users. The more the users use the system, the more they get to know whether they like or dislike it. The impact on the individual level is directly linked to use and user satisfaction. The impact on the organisation level is felt whether a system is a success or failure, as the impact can be positive or negative.

In 2003, William H. DeLone, together with Ephraim R. McLean, revised the IS model of success. With the change in technology and the change in how the technology is used, they saw a need to evaluate the relevancy of the success model. The updated model is shown in Figure 3.9, taken from DeLone and McLean (2003:24).

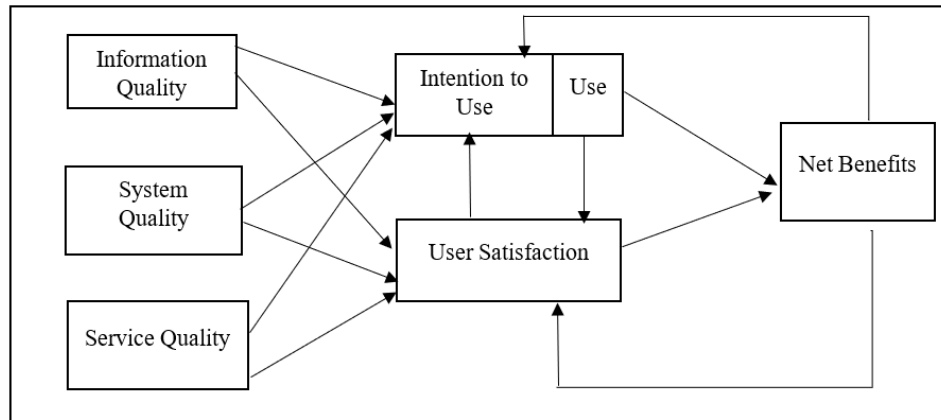


Figure 3.9: Updated IS Success Model (DeLone & McLean, 2003:24)

On the updated model, a third dimension of quality was added; it refers to service quality. The implementation of IS does not end with the system being rolled out. Continuous support to the end-users is required throughout the life of the system. Without continuous support, the system might not survive. End-users need the assurance that, should support be required, it is available for them. This potentially improve the motivation to use the system. Also, intention to use was added as a contributing factor of use. DeLone and McLean (2003:23) explain that “Intention to use is an attitude, whereas use is a behaviour.” Intention to use, use and user satisfaction are interrelated. User satisfaction cannot be experienced if the system is not used and in turn the system cannot be used without an intention to use it. If users are satisfied, it will lead to increased intention to use a system and therefore use will be improved. DeLone and McLean (2003:23) say “As a result of this use and user satisfaction, certain net benefits” (either positive or negative) will be realised. The net benefits include the combined individual, group and organisational benefits of IT use.

The success of IS is not possible without the benefits being realised and benefits cannot be realised if a system is not used. With benefits realisation (BR), all the stakeholders have a role to play to ensure that they are realised. To measure success and whether the use of the system is as intended, the impact of the system must be felt on both the individual level as well as the organisation level. BR is another factor that is used as an indicator of whether a system is being used for what it is intended for or not. BR as a form of measuring system use as intended is discussed next.

3.9 BENEFITS REALISATION

The benefits derived from a system are directly linked to its use or non-use. If BR is not well defined and documented, then there is no way of showing whether an investment is of value or renders no value. Lederer and Nath (1990:76) say “top executives are questioning whether they have been receiving sufficient return on their exorbitant computer investments.” Benefits are presented as part of the motivation to invest in systems, hence, they are defined right in the beginning of the project. Proper processes and systems to keep track of the promised benefits, whether quantifiable or non-quantifiable, must be in place.

Intended use and BR are intertwined. Intended use feeds into BR if the system is used for what it is intended for then positive benefits will be achieved. This is supported by Straub *et al.* (1995:1328) saying that system usage is a pre-requisite for deriving the benefits of an IT investment. If a system is not used, benefits will not be realised. For impact to be experienced, it is imperative that usage is tied to organisational performance metrics. The appropriate use of IT assets results in positive impacts; IT impacts positively when positioned competitively and impacts organisational performance for the better. System use is not a critical factor to measure IS success, the most important factor is that use must yield positive net benefits (Seddon, 1997:242). DeLone and McLean (2003:16) state that “[f]or instance, without system use, there can be no consequences or benefits. However, with system use, even extensive use, which is inappropriate or ill-informed, there may also be no benefits.”

3.9.1 Benefits definition

How benefits are defined and measured differs from system to system. Benefits can be defined from the perspective of the end-user and/or organisation. From the strategic point of view, organisations invest in IS that will have a positive impact on the organisation and its people. For decision makers to agree on investing in a certain system, it means an evaluation of the investment has been done and, often, a business case is presented for a project to be approved. Giaglis *et al.* (1999:51) explain that “a proposal for a particular system is initiated with specific business goals in mind and with a set of primary objectives being sought by the introduction of the system. These objectives constitute the expected benefits that have to be comparatively evaluated against costs, in order to justify the proposal.”

Benefits are documented as part of the business case, but tracking and reporting of these are often not clearly defined. It is acceptable to document benefits on paper but there must be a way of showing how the benefits will be realised and the realisation of these benefits must be tracked and reported. Remenyi and Sherwood-Smith (1998:2) divided benefit tracking in three phases: benefits planning, delivery and review. The definition of each of the phases are:

1. Benefit planning is “the process of identifying and enumerating the planned outcomes of an IS development project and explicitly stipulating how they will be achieved.” (Remenyi & Sherwood-Smith, 1998:2)
2. Benefit delivery is “the execution of the set of actions necessary to realise all of the benefits specified in the benefits plan.” (Remenyi & Sherwood-Smith, 1998:2)
3. Benefit review is “the process by which the success of the project in terms of benefit delivery is assessed; opportunities for the realisation of further benefits are identified; and lessons learned and opportunities for improvement in future projects are identified.” (Remenyi & Sherwood-Smith, 1998:2)

Although the benefits of an IS investment are identified very early in the project, they cannot be realised unless the system is used as intended. According to Seddon *et al.* (2010:313), “no matter how good the software and no matter how well it has been configured and tested, unless people in the organisation are motivated to use the system and in addition have sufficient knowledge of how to use the system effectively, the organisation is unlikely to gain its desired benefits from the system.” Benefits are often not realised because “many organisations are not using computer-based information systems to its best advantage.” (Lederer & Nath, 1990:76)

Benefits are derived from system use. Many resources are directed at the implementation of the technical part of the IS, not realising that even a well implemented system might not yield the required benefits if it is not used as intended. DeLone and McLean (2003:16) argue that “even when use is required, variability in the quality and intensity of this use is likely to have a significant impact on the realisation of the system benefits.” It is crucial that benefits are delivered, tracked and reviewed to demonstrate the value of the investment. Benefits tracking is discussed next.

3.9.2 Benefits tracking

One of the many ways to measure the success of a system is defined from the benefits derived in utilising the system. Often benefits are realised, but if they are not tracked and reported, then they are of no value to the people who made the investment decisions. It is imperative to track benefits. According to DeLone and McLean (2003:17), “management always has the option of discontinuing a system that is not providing desired results and benefits.”

Benefits can be positive or negative, subjective or objective, quantifiable or non-quantifiable. Benefits that need to be tracked are defined and agreed upon by all stakeholders. DeLone and McLean (2003:22) asked a question, i.e. “what qualifies as a benefit? for whom? and at what level of analysis? The second issue of concern is: benefits for whom - the designer, the sponsor, the user, or others? Different actors, players, or stakeholders may have different opinions as to what constitutes a benefit to them.” The measuring of benefits is based on the purpose of the system being evaluated (DeLone & McLean, 2003:19). Figure 3.10, taken from Andresen *et al.* (2002:64), shows the IT benefit measurement process.

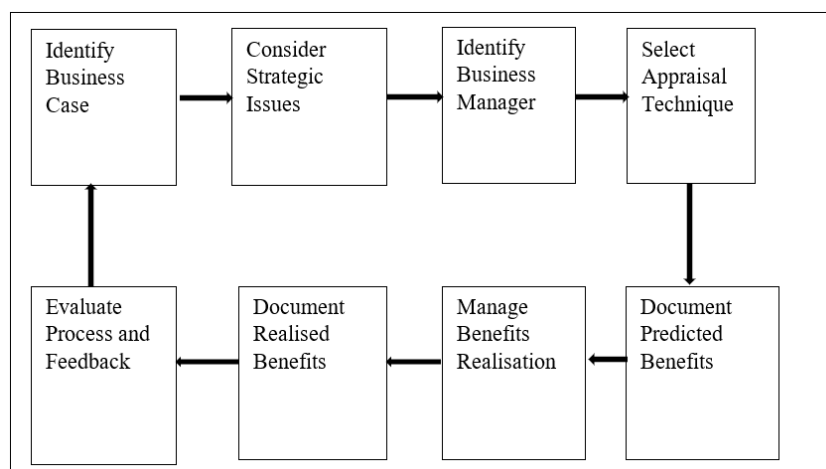


Figure 3.10: IT benefits measurement process (Andresen *et al.*, 2002:64)

Realised benefits must be tracked, documented and reported. So, another important factor is the nomination of the benefit manager who will be responsible for making sure that the benefits are realised and reported. Benefits are often not reported because there is no dedicated person assigned to track and report on the benefits. Strategic issues are taken into consideration when deciding which benefits will be tracked and reported and the predicted benefits must be documented to be compared to the actual benefits. The selection of the technique to measure

benefits is also crucial as it will guide the benefits manager to track them. The last part of the process is the documentation of the actual benefits. There are different types of benefits; not all benefits are measurable. Figure 3.11 below, taken from Giaglis *et al.* (1999:52), shows the different types of IS benefits.

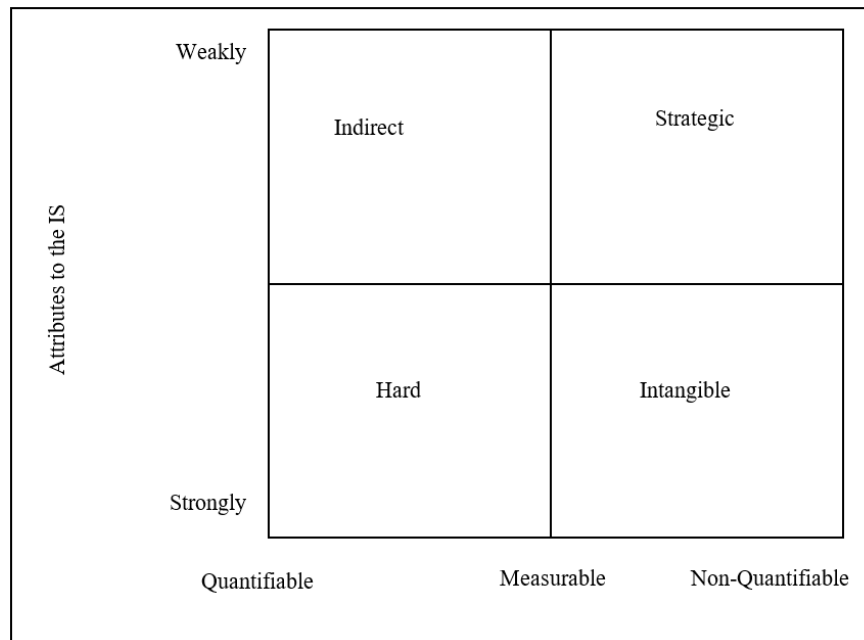


Figure 3.11: Different types of IS benefits (Giaglis *et al.*, 1999:52)

Benefits can be indirect, strategic, hard or intangible. Hard benefits are realised as a direct result of the introduction of the IS and are easily measured. Soft benefits include at least intangible, i.e. indirect and strategic benefits (Giaglis *et al.*, 1999:51). Benefits of IS can be directly or indirectly linked to the introduction of that system and they can be deemed strong or weak. Strong is based on to what degree the benefits are related to the introduction of a system and weak is based on to what degree the benefits are related to other organisational factors. Hard benefits are related to the reduction of cost as a result of the system. Hence, it is measurable and quantifiable. Intangible benefits are not quantifiable, but can be directly linked to the introduction of the system. It is difficult to quantify intangible benefits such as improved decision making, because they are subjective, but that does not mean the benefits cannot be tracked and reported. Understanding the type of benefits that can be realised in IS assists the benefits manager in how to report benefits, so as to advantage all interested stakeholders. The measuring of net benefits must take into consideration the “stakeholder’s point of view about what is valuable and what is not.”(Staples *et al.*, 2002:117) There is no one type of benefit that

is superior to the other. They are all equally important and must all be included when BR is devised. In most cases, benefits of strategic nature are realised in the long run. These are the benefits that gives an organisation a competitive advantage over its competitors. Strategic benefits are often difficult to quantify, however, they must be predicted, tracked and documented. Benefits reporting is discussed next.

3.9.3 Benefits reporting

Any type of IS benefit must be measurable for it to be tracked and reported (Remenyi & Sherwood-Smith, 1998:88). Measurable benefits are objective and easy to report. Benefits are tracked and the results are documented then reported to show all the stakeholders the value derived from implementing the system. The reason for tracking the benefits is not only to show the positive side of the benefits, the negative side must also be reported. When a benefit is measured, both negative and positive is investigated. One can either benefit positively or negatively from IS. To report on the negative is also beneficial for future improvement of the system. Both quantifiable and non-quantifiable benefits are to be reported on as well. Having realistic expectations on system benefits help with the realisation and reporting thereof. Having unrealistic expectations is a recipe for failure. According to Remenyi and Sherwood-Smith (1998:89), “identified benefit needs to be assigned a specific measurement metric so as to ascertain whether or not the benefit has been realised.”

Benefits realisation includes planning, tracking and reporting of benefits. These activities can be achieved through the benefits realisation management programme which will ensure that planned benefits are managed effectively (Ashurst & Doherty, 2003:1). Usage is a major contributing factor to benefits realisation. The study seeks to understand the perspective of end-users regarding the intended use of knowledge management systems (KMSs) that they use or used. For an organisation to realise the benefits or declare a system a success, usage must be measured first. Usage as a contributing factor to the success of a system is explained next as there are different approaches to measuring usage.

3.10 APPROACHES FOR MEASURING SYSTEM USAGE

Researchers choose specific approaches to measure system usage, based on what they want to achieve with the results. Burton-Jones and Straub Jr (2006:231) propose a staged approach for

defining system usage and selecting measures, i.e. the definition stage and selection stage. Before a study is undertaken, the researcher already knows the objective of the study and the objective must guide him/her in choosing the type of measure he/she employs. Figure 3.12 shows the two stages and gives an explanation of what each stage entails.

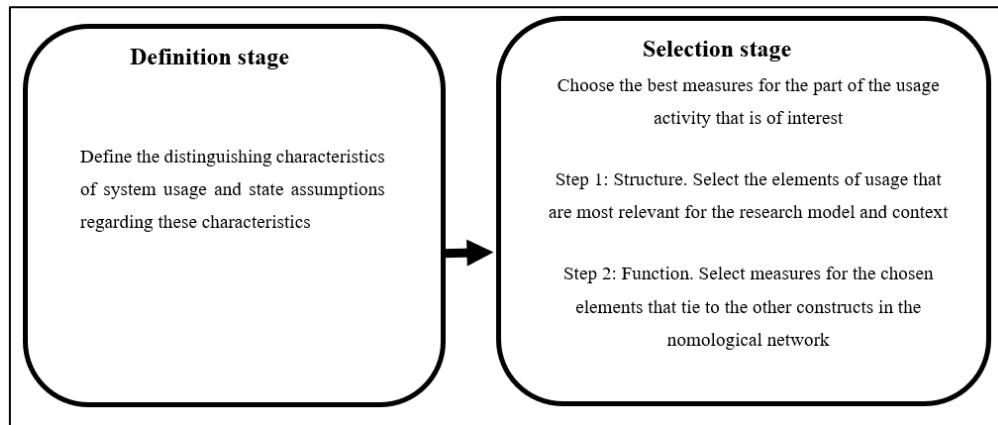


Figure 3.12: Staged approach for defining system usage and selecting measures (Burton-Jones & Straub Jr, 2006:231)

The definition stage is the first stage, followed by the selection stage. In the selection stage, the researcher selects the elements of usage and measures for the selected elements. Figure 3.13, taken from Burton-Jones and Straub Jr (2006:233), shows the summary of how system usage is measured using the lean and rich measures.

Richness of measure	1. Very Lean	2. Lean	3. Somewhat Rich (IS)	4. Rich (IS, User)	5. Rich (IS, Task)	6. Very rich (IS, User, Task)
Type	Presence of use	Extend of use (omnibus)	Extend to which the system is used	Extend to which the user employs the system	Extend to which the system is used to carry out the task	Extend to which the user employs the system to carry out the task
Domain of content measured*	Usage	Usage	Usage System User Task	Usage User System Task	Usage System Task User	Usage System User Task
Example	Use/no use	Duration: extend of use	Breadth of use (Number of Features)	Cognitive absorption	Variety of use (number of subtasks)	None to date (Difficult to capture via a reflective construct.

Figure 3.13: Rich and lean measures of system usage (Burton-Jones & Straub Jr, 2006:233)

Lean measures focus on usage alone, while rich measures involve the following three elements: system, user and/or task. It is up to the researcher to decide which measure is compatible to the objective of their research when choosing which approach to take. Lean measures measure usage based on use or non-use, extend of use, time spend on the system and the number of features used. Rich measures do not only focus on usage alone, other factors that affect usage such as the system, user and the task, are taken into consideration. As indicated previously, system use does not occur in isolation. The extent to which the user employs the system, the extent to which the system is used to carry out the task and the extent to which the user employs the system to carry out the tasks are measures used in the rich measure of system usage. Usage focuses more on the system including internal factors such as tasks performed and external factors such as the user of the system. The system, user and task all contribute to usage.

There is another aspect of evaluating usage, Chin *et al.* (1997:344) introduce faithfulness of appropriation. Faithfulness of appropriation is used to measure whether the system is used in a manner consistent with its overall goals and objective. Usage is measured in relation to expected use or intended use. Larsen (2003:182) define faithfulness of appropriation as “the extent to which a group's use of the IS's structures was consistent with the original design intent of the system developers.” Appropriation by its very nature, is restricted to technologies that call for explicit agreement regarding use. Meaning that, the intended use must be understood by all involved. But it must be noted that a unique or innovative use of a system may well be faithful appropriation, as long as the use is consistent with the spirit that the system is intended to promote. DeLone and McLean (2003) refer to it as informed and effective use. According to Doll and Torkzadeh (1998:171), “effective use of IT is considered as a major determinant of competitive advantage, productivity, and even personal competency.”

Chin *et al.* (1997:345) also introduce another concept called spirit. Spirit can be described as the general objective and procedure that aims to promote and can be interpreted in a manner analogous to the spirit of the law. The spirit refers to the design metaphor underlying the system, the system's features, the user interface, reference materials and information from sources such as the system's designer or observation on how users perceive the system. Two types of spirits exist: a) an externally defined (by the designers and solution owners) and it is called the objective spirit and b) internally defined (by participants) and it is called subjective

spirit. The objective spirit defines how the system ought to be used and this can be used to evaluate how users use the system based on how it ought to be used. It is embedded in the aims and objective of the system. It can be found in project documentations such as design materials, training materials, project communications and testing materials.

When a system is introduced to the users, users often develop their own defined spirit; that is the internally defined spirit, which is subjective. Users always have their own perceptions about the system and they often impose the perception when using the system. The perception is subjective as it differs from user to user. The designer might try very hard to explain the aims and objective, but over time, they will form their own spirit which cannot be ignored. The perception of stakeholders evolves and it is influenced by factors such as user's personal requirements and experience, capabilities and knowledge about the subject (Remenyi & Sherwood-Smith, 1998:96).

Faithfulness of appropriation and spirit, as defined by Chin *et al.* (1997:344), resonate with the aim of this study. The aim is to understand the faithfulness or the spirit with regards to the use of KMSs from the perspective of the end-users in order to propose guidelines on how to improve the usage thereof. The study investigates faithfulness based on both the external spirit and internal spirit. The study explores the understanding of the users in relation to the aim and objectives of the system. Doll and Torkzadeh (1998:174) say “in studying the impact of IT, we cannot just study what workers do, but rather how prepared and empowered they are to do what they need have to do.”

Figure 3.14 below, taken from Chin *et al.* (1997:346), shows the relationship between spirit, usage and faithfulness. Spirit of the technology is presented to the users and they in-turn interpret it based on their own understanding. A system can be evaluated in two ways: a) external person evaluates the user behaviour and b) user assess their own behaviour. To assess faithfulness, micro coding or scale can be used. Micro coding is used to assess the objective spirit compared to the user behaviour, while scale evaluates the subjective spirit compared to user's perception.

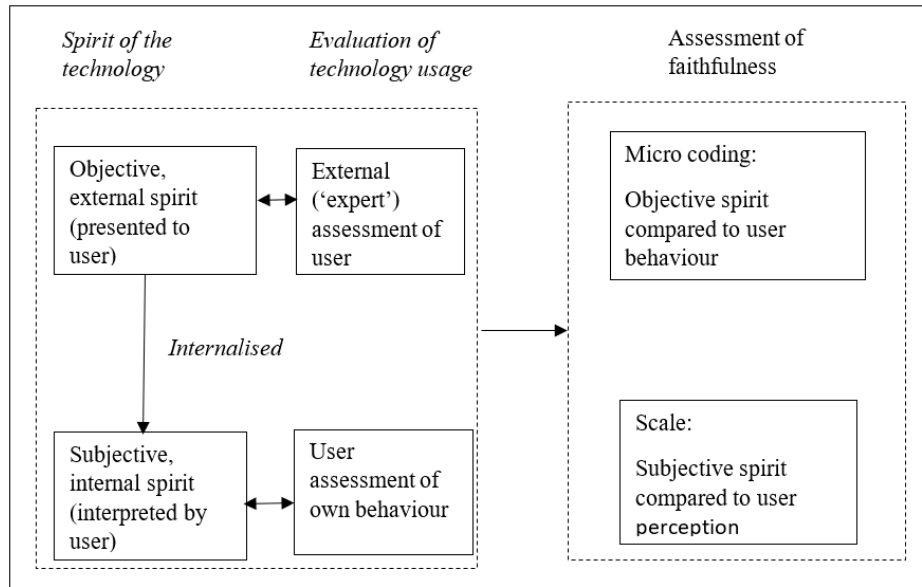


Figure 3.14: Relationship between spirit, usage and faithfulness (Chin *et al.*, 1997:346)

3.11 SUMMARY

IS are discussed first in this chapter because the introduction of an IS, is done for a purpose; the purpose must be known and understood by all stakeholders. The discussion on the strategic planning of IS provide more insight with regard to where IS begins. There are many factors that contribute to the success of a system and following a SDLC can give structure to the development of a system. In this chapter the researcher also details end-user involvement in IS, IS use, as well as the intended use of IS, in order to give context to the aim of the study.

IS usage measures are explored to understand different factors that affects usage. The following usage measures: TAM, TRA, TPB, DeLone and McLeans's model of IS success, as well as BR, were discussed. Many different factors were observed from the various models that seek to explore and explain the relationship between success and the variables that directly and indirectly impacts the success of a system.

Approaches for measuring system usage is discussed because intended use is at the core of this research hence use and usage is considered an important factor. According to Seddon (1997:242), system use has three possible meanings: "a behaviour, a proxy for benefits, and an event in a process leading to individual or organisational impact." Use must have a context and

the context can be objective or subjective. Because system use is an event or a behaviour, it impacts on other important factors of IS as there are many factors that influences the behaviour.

The aim of this study was to understand the perspective of end-users regarding the intended use of knowledge management systems (KMSs) that they use, to develop and propose guidelines for improved use, i.e. as intended. To achieve this, the researcher incorporated rich measures, which takes into consideration the system, user and the task as part of the investigations. For the purposes of this study, the researcher investigated the relationship between spirit, usage and faithfulness which entails the subjective spirit, as interpreted by the user. This was incorporated in the questions that the researcher asked participants. Subjective spirit was derived from objective spirit, meaning the objective spirit must have been presented to the users for them to devise the subjective spirit. Objective spirit is what the developers or the implementers seek to achieve with the system. Users were given an opportunity to assess their own behaviour based on their understanding of the intended use of a specific KMS. This is discussed in Chapter 5. SharePoint, as the KM applied in the organisation where the research was conducted is positioned in the next chapter.

CHAPTER 4: SHAREPOINT AS A KNOWLEDGE MANAGEMENT SYSTEM

4.1 INTRODUCTION

The aim of this study was to understand the perspective of end-users regarding the intended use of knowledge management systems (KMSs) that they use, to develop and propose guidelines for improved use, i.e. as intended. The guidelines are based on the data collected from the end-users. The purpose with this chapter is to introduce SharePoint. SharePoint is a KMS of choice for the company where the research was conducted. In this chapter, the researcher investigates what the company seeks to achieve with the KMS. This is done so that the reader can understand the context to the questions and answers provided by the participants.

The intent of a system from the business perspective can be found in the aims and objectives of the system, project documentation such as design and training material, project communication and testing documentations. The researcher used the above-mentioned documents from the company in a quest to explain SharePoint as a KMS. The process followed by the company to implement and roll-out SharePoint is explained in detail. The reason for providing details on SharePoint is because the data gathered from participants is solely based on this system. The researcher explored how these users experienced this system.

This chapter is structured as follows: Section 4.1 is the introduction of the chapter; Section 4.2 introduces the business where the research was conducted and the KMSs employed by the company; Section 4.3 investigates what SharePoint is and how it fits in the KM spectrum and the aim and objectives of SharePoint are investigated; Section 4.4 explores the deployment process used to roll out the system in the company; the benefits of SharePoint as envisaged by the company are outlined in Section 4.5 and the chapter concludes with a summary in Section 4.6.

4.2 BUSINESS PROFILE

SAS Pty Ltd (name changed to keep the anonymity of the company) is an international chemicals and energy company with more than 31 000 employees across different countries. With the company having presence in 35 countries, management of its knowledge is very crucial in ensuring continuity and success of every business unit (BU). In 2013, the company embarked on a journey to implement a KMS. Several KM IS were evaluated and the decision

was taken to implement SharePoint as the company's KMS. The system has since evolved as a result of several upgrades and enhancements.

4.3 SHAREPOINT AS KNOWLEDGE MANAGEMENT SYSTEM

Sultan (2013:163) states that Microsoft is one of the leading providers on KM tools and SharePoint is a technology they use. According to Ngai and Chan (2005:895), "SharePoint Portal Server software is a knowledge management tool that is an end-to-end solution for managing documents, developing custom portals and aggregating content from multiple sources into a single location." It offers businesses a secure enterprise portal solution for KM, document management and end-user collaboration (Yates & Paquette, 2010:5). Bizjak (2006:210) refers to SharePoint as one of the IS that can provide the organisations with means for capturing, cataloguing, storing, sorting, searching and presenting knowledge. For SAS Pty Ltd, SharePoint is the tool of choice for KM. SharePoint facilitates the management of both tacit and explicit knowledge. Figure 4.1 shows the company's strategic enterprise service management architecture indicating SharePoint as the KM tool of choice.

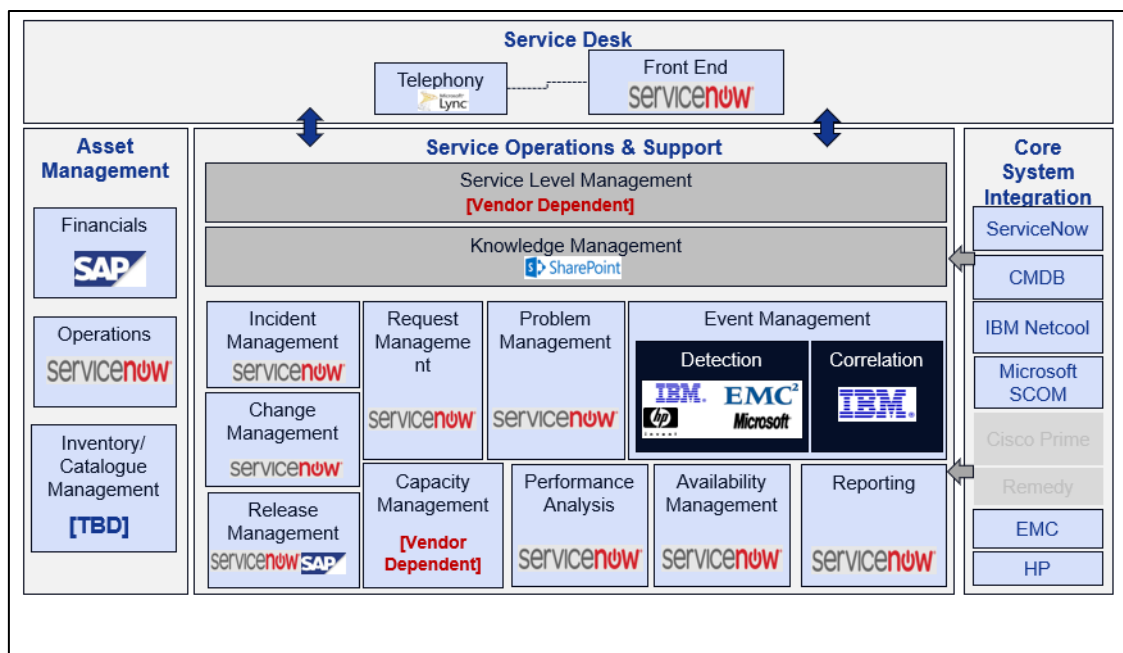


Figure 4.1: Strategic enterprise service management architecture for SAS Pty Ltd

4.3.1 The aim and objectives of SharePoint

The aim and objectives of any technology solution are stipulated in the business strategy document. Jamison *et al.* (2013:4) outline some of the key points that must be addressed as part of the SharePoint strategy. Figure 4.2 shows the seven key questions that must be addressed as part of the SharePoint strategy. They are:

1. “What are the key business objectives or scenarios that you want to enable? How can SharePoint address these key business objectives?”
2. “Who are the primary stakeholders for these scenarios?”
3. “Which capabilities of SharePoint 2013 are relevant to the business problem?”
4. “How will the organisation measure the business success of the SharePoint initiative?”
5. “What processes are needed to ensure that all of the SharePoint users are aware of and accept their roles and responsibilities with regards to the SharePoint solution?”
6. “How will you plan for both the design and ongoing maintenance of the content in SharePoint?”
7. “How will you launch and deploy to ensure successful adoption?”

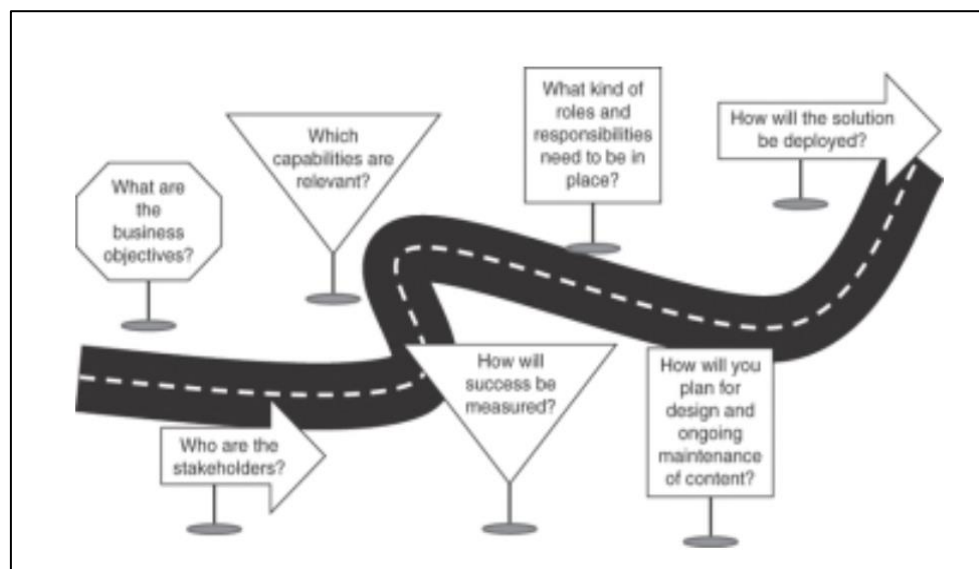


Figure 4.2: A SharePoint strategy roadmap (Jamison *et al.*, 2013:4)

Clear business objectives, stakeholders, capabilities, success measures, deployment strategy, maintenance and support are key in ensuring that the system is adopted and used for its intended purpose. The strategy roadmap for the company is discussed in the next sections.

4.3.2 The SharePoint landscape

The SharePoint landscape outlines the objectives of the business, i.e. what the business envisages to achieve with the tool. The landscape includes structures that will be catered for on the SharePoint tool. The landscape of SAS includes intranet, internet, records management, workflow, social media, collaboration sites, team sites, blogs, emails, communities of practice (CoP), individual content, controlled and uncontrolled documents management.

Team and departmental sites enable employees to discuss matters related to certain topics and also allow for permissions to be set with regard to who can be part of the discussions. This facilitates the creation, organisation, sorting, sharing, finding and use of tacit knowledge. Employees can also create personal folders for the individual work they do. Instead of saving information on the desktop or external drives, employees are encouraged to save information on SharePoint as it can be safely stored and easily shared. SharePoint is integrated with the company email system. Links to interesting topics can be shared via email and documents can be shared using links instead of attachments. Videos and Podcasts can be uploaded and shared with everyone in the company. There is no limitation on the type of files and the amount of data one can save on the system.

Communities of practice (CoP) facilitate discussion across the company. This is where different employees across the organisation socially discuss matters of mutual interest and learn from one another. The social interaction allows employees to “create, share, rate and consume content.” (O'Dell *et al.*, 2011:7) Content captured will always be on the system, whether the contributor is still part of the organisation or not. Thus, information will not be lost when employees leave the company. SharePoint also has a workflow where, if a document needs to be approved, a workflow for the approval process can be built, sharing the documents. The workflow enables employees to make configurations that can facilitate the capturing, allocation of specific tasks to individuals or groups and monitoring of the feedback as captured by the respective people. The audit trail and backup of information are functionalities that are crucial, as everything that is done on the system can be audited and information can be backed up for future use. No data will ever be lost.

Permission is a functionality that enables end-users to decide who can access their information and who cannot. Companies deal with confidential data and it is important that it should only

be accessed by those who are authorised. Therefore, SharePoint allows employees to set permissions for security and confidentiality purposes.

4.4 DEPLOYMENT OF SHAREPOINT

The success of any KMS depends heavily on the users. Sultan (2013:164) points out that, “No KMS, no matter how sophisticated, is likely to succeed without the enthusiasm, input and participation of people.” Content is created and used by people. How systems are deployed and the strategies used for deployment have a huge impact on the success of the system. The deployment approach is discussed next.

4.4.1 Deployment approach

SharePoint is an enterprise system and therefore, the development and customisation are done on the enterprise level. For SAS Pty Ltd, the approach taken was to have each BU represented in the deployment phase. The representatives were empowered to make a decision on behalf of their BUs. Representatives included BU information management managers, business partners and area managers. The introduction of SharePoint to the end-users was the responsibility of the BU representatives. Each BU had its own deployment strategy based on the user base, location and the culture of the BU. Change managers, subject matter experts as well as trainers were part of the deployment stakeholder group.

4.4.2 Change management

Change managers were appointed to devise a strategy on how change management would be rolled out. Change managers were responsible for the overall management of change and therefore, change agents for each BU were appointed to roll out the strategy per BU. Change agents were business partners from information management. Their roles were to identify all the relevant stakeholders and ensure they understood the impact of SharePoint.

Emails were sent to the identified people regarding the system. Workshops were also held to explain what the system was all about and to outline the deployment plan. All stakeholders had to understand the goals and objectives of the system and change agents ensured that the message was delivered and understood by everyone involved. The questions of whether everyone who was impacted by the system received and read the email and also attended and

understood the message from the workshops, were not all answered. This was not followed up, tracked and reported. Change management is not about training end-users on the functionality of the system but rather to ensure that everyone understands the goals and objectives of the system. Training as a component of change management is discussed next.

4.4.3 Training

Training was part of the deployment strategy to ensure that all those who are impacted by the system can use the system after the system goes live. Training is not about showing end-users where to click, for example, but to show them the intended purpose of each functionality and how to use the functionality to achieve the intended purpose. Many systems fail because end-users do not understand the intent of some of the functionalities (Dwivedi *et al.*, 2015:145). For example, if a system has a functionality to upload a document for sign-off, this does not mean end-users can use the system to save documents to access at a later stage. For example, if the system is used to save documents, because it has a functionality to upload a document, then the functionality will not have been used as intended.

Training was classified into five categories: super user, approver, content owner, end-user and team member training. The training approach that was used to train the end-users was train-the-trainer. Train-the-trainer approach allows for super users to be trained and they in turn are expected to train the other end-users. This approach was employed to empower business representatives who are living amongst the end-users to easily assist when issues arise. Super users are therefore the first line of support to assist the end-users. They have access to the trainers in cases where they encounter any issues that they cannot resolve. Copies of the training materials were issued to the end-users and they are also available on the system.

Two-hour classroom training was arranged, and users were scheduled based on their availability. Training was conducted in a central place and employees from satellite locations travelled to the central place to attend training. For managers to book accommodation, flights, hire car for employees to attend training showed their commitment in empowering the users to know and understand the system. Management support is very crucial in ensuring the buy-in and adoption of the system.

4.4.4 Support

As mentioned in Section 4.4.3, the first line of support is the super user. The second line of support is the SharePoint consultant that can be accessed through logging a call with the help desk. Logged calls are tracked, monitored and progress reported to the end-users until the matter is resolved. This is a more formal method of getting assistance which can be tracked and audited.

There is also a help functionality on SharePoint, the help functionality includes the frequently asked questions (FAQ) which gives a quick answer to the questions that have been asked before. Community of practice (CoP) was also created for all the users to collaborate and share pertinent information regarding the system. This allows end-users to also give each other some tips on how to use the systems and derive value out of using the system. CoP bring together different type of users with different expertise and experience to collaborate on subjects of common interest on the systems. It is a platform that is used to share best practices and lived experience. Subject matter experts can also offer advice and assistance where required through CoPs.

4.5 BENEFITS OF SHAREPOINT

The benefits as cited by the company for using SharePoint as a KMS are:

1. Rich social features let employees share what they are working on, ask questions and keep track of what other colleagues are doing.
2. Search profile features help employees connect with people across the organisation and easily discover interests, past projects and documents they've worked on. It assists

employees with finding answers to questions and discover experts they never knew existed in the organisation.

3. Simpler sharing and permissions management for sites and content.
4. It keeps team in sync by allowing teams to set up a new team site and set permissions, track meeting notes and bring together all the team's email and documents in one place.
5. SharePoint helps employees quickly customise and narrow their search to deliver more relevant results and also provides recommendations on people and documents to follow.
6. Allows teams in various location to co-author documents.

4.6 SUMMARY

Chapter 4 introduced SharePoint as a KMS for the company where the research is conducted. Company documents were used to investigate the aim and objective of the system. The implementation strategy, change management process, training approach as well as the support model employed by the company were investigated. The benefits as envisaged by the company were presented as well. Although the benefits are not tracked and documented, the benefits and improvements will be experienced by those who use the system. The next chapter discusses the collection, analysis and interpretation of data from the participants.

CHAPTER 5: EMPIRICAL STUDY

5.1 INTRODUCTION

The aim of this study was to understand the perspective of end-users regarding the intended use of knowledge management systems (KMSs) that they use, to develop and propose guidelines for improved use, i.e. as intended. The study was performed in the interpretive paradigm, using grounded theory as the research methodology. This study entailed researching how a group of employees from a specific company understood the intended use of a specific KMS in the organisation where they worked and how they thought it could be improved. Thus, the purpose with this chapter is to investigate and discover the perspectives of the end-users on how KMSs' use can be improved. Data was collected from the end-users, analysed and interpreted to reveal their understanding of the intended use of the system.

The chapter is organised as follows: Section 5.1 is the introduction to the chapter; Section 5.2 outlines the research approach; Section 5.3 presents the process followed to collect the data; Section 5.4 details the process of analysing the data; the interpretation of the data is presented in Section 5.5 and the chapter is concluded with a summary in Section 5.6.

5.2 THE RESEARCH APPROACH

The research approach followed in this study is outlined in Figure 5.1. It shows that the researcher gathered data using the formulated research questions and after obtaining ethics approval. She chose and invited suitable participants from the company where the research was conducted and then interviewed the participants who agreed to take part in the study. She gathered data through the interviews and transcribed the gathered data. She documented the data, by writing memos, in order to keep track of the data and also to aid her understanding of the gathered data. She then analysed and interpreted the data and concluded the study. All this is detailed in the remainder of this chapter.

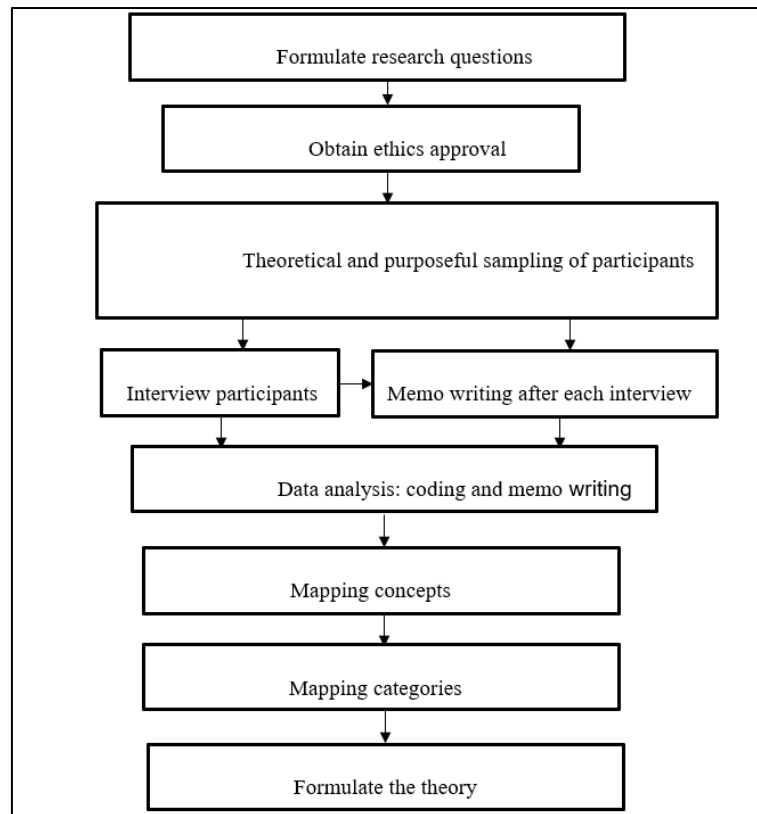


Figure 5.1: The process followed in this study

5.3 DATA GATHERING

This section presents the process followed by the researcher to gather data ethically. In Chapter 2, research paradigms and methods were discussed, and a suitable approach selected. The research method selected for this research was grounded theory. This theory is positioned in the interpretive research paradigm. Table 5.1 shows the interview questions, which were also presented and explained in Chapter 2.

Table 5.1: Interview questions

Interview questions	
1	What level is your current position?
2	How long have you been using SharePoint?
3	What is your main purpose for using SharePoint?

Interview questions	
4	When requirements are gathered, to what extend are you involved?
5	Would you like to be more or less involved with requirements gathering?
6	Substantiate your answer in question 5.
7	What is your understanding of the aim and objective of SharePoint
8	Please describe how using SharePoint impact your day to day job?
9	What do you like most about SharePoint?
10	What would you change about SharePoint?
11	What type of training did you receive for using SharePoint?
12	Describe the value add of the training you received?
13	Explain what you do when you need help with the system.

5.3.1 Ethical process followed

The ethical considerations for this study were explained in Chapter 1. Approval to conduct the study was obtained from the relevant ethics committee of the North-West University (NWU). Before the interviews were conducted, permission from the company where the research was conducted was obtained (refer to Appendix A).

Participants identified to participate in the study were invited to do so using an electronic invitation, sent via e-mail (refer to Appendix C for a sample). Participant selection is discussed in Section 5.3.3. Identified participants were assured that participation was voluntary and they were given an option to accept or decline the invitation to participate. In total, five of the eight identified participants accepted the invitation and participated in the study. Before the interviews, the participants were asked to sign a consent form (refer to Appendix B for an example).

At the start of the interview, the researcher explained that participants could withdraw from the interview and/or study at any point, without any negative consequences to them. The name of the company was not disclosed, and participants would remain anonymous. Any information that could lead to the identification of the company or participants had been redacted to protect their confidentiality.

5.3.2 Data gathering method

The data gathering method used in this study was open-ended, semi-structured (to allow for follow-up questions as required) and individual interviews. The purpose of the interviews was to collect meaningful qualitative data by allowing the interviewee (i.e. the participant) and the interviewer to interact with each other. The interaction gave an opportunity for both parties to clarify potential misunderstandings (if any) and allowed for follow-up questions where required. The interviews were conducted face-to-face and individually, in order to collect rich data based on the lived experiences of the participants. Rich data allows a researcher to construct a thorough analysis as it reveals “participants views, feelings, intentions, and actions as well as the context and structures of their lives.” (Charmaz, 2006:14)

The researcher confirmed the content of each interview with the participant verbally and using written notes, immediately after each interview. Data was then analysed by the researcher using the raw data, codes and memos to formulate a theory. Theoretical saturation was achieved as per the data collected and text that was analysed.

For this study, the researcher employed an abbreviated version of grounded theory, as explained in Chapter 2. Data was collected by means of one interview per participant. Participants were purposefully selected - this is explained in the next section. The researcher did not refine the questions after each interview but used the set of questions as posed earlier in this chapter and explained in Chapter 2.

5.3.3 Purposeful sampling of participants

The participants were purposively selected on the basis that they were end-users of the organisation’s KMS (i.e. SharePoint). Therefore, the criteria used were that the participants should have been using the organisation’s SharePoint and participants were employees of the company where the research was conducted. The participants included employees at different

job levels (referred to as positions) and having different levels (in terms of years) of experience of the system. The profiles of participants are presented in Table 5.2 below. The table also indicates the unique code assigned to them for this study.

Table 5.2: Participants profiles

Participants	Current Position	Number of years using SharePoint
P1	Senior specialist	5
P2	Specialist	3
P3	Middle management	3
P4	Specialist	2
P5	Administrator	4

Participant P1 has been using SharePoint for five years and his/her current position level is that of senior specialist. P1 has the most years of experience using SharePoint, when compared to the other participants. Both participants P2 and P3 have an equal number of years of experience using the system. They have been using it for 3 years. P2 is a specialist, while P3's position level is middle management (thus, more senior than P2). P4 is a specialist with 2 years of experience and knowledge of the system. P5 follows P1 on the number of years working on the system. He/she has four years working on the system and is an administrator by position.

5.3.4 Interview process

As indicated earlier, eight possible candidates were identified and requested (via e-mail) to voluntarily participate in the research. An example of the invitation is included in Appendix C. It included the purpose of the research and a request for permission to participate in the interview. The interview questions were also included. The candidates were given an option to accept or decline the invitation. Five candidates accepted the request and three declined. The reason cited for declining was unavailability during the period of the interviews. A follow-up confirmation meeting invitation was sent to those who accepted the request, to confirm the date/time of the interview. Before the start of the interview, the researcher explained the purpose of the research and how the interview was to be conducted.

Participants were given a consent form to sign (Appendix B). Written notes were used to capture the data from the interview. The meetings were scheduled for one hour per participant.

The interview took approximately 45 minutes for each candidate. At the end of the interview, both the researcher and the participants reviewed the written answers to ensure that the data was captured correctly, and changes were made where necessary. Participants were given an opportunity to ask questions at the end of the interview. One participant asked the researcher to share the research report once finalised and the researcher agreed to share the final report with the participants. It was also mentioned in other interviews that the final report would be made available to those who are interested.

After each interview, the researcher documented findings (using memos) to generate more explanations of the data and summarised the relationships amongst the data already collected. Memo writing does not end after the interview. It continues throughout the research until the end, as it is an integral part of grounded theory research (Corbin & Strauss, 1990:10).

5.4 DATA ANALYSIS PROCESS

According to Corbin and Strauss (1990:14), coding is fundamental in grounded theory. Data is analysed using codes, memos (as verbatim notes of what was said and added observations) and the constant comparative method. Birks and Mills (2015:94) explain that there are three types of coding in grounded theory, namely initial, intermediate and advance coding. The coding stages are referred to differently by different writers. Corbin and Strauss (1990:12) refer to the coding stages as open, axial and selective coding. For this study, the researcher refers to the different stages of coding as initial, intermediate and advanced coding, as explained in Chapter 2.

In grounded theory, data collection and analysis are carried out concurrently. For this study, data was captured, pre-coded and coded using different coding phases. Pre-coding refers to the “circling, highlighting, bolding, underlining or colouring rich or significant participants quotes or passage that strike you as codable moments worthy of attention.” (Saldaña, 2015:16). Pre-coding is also done so that the researcher can be able to spot codable data. Pre-coding is followed by coding and once coding has been completed, the codes are analysed and the analysis of the codes leads to the formation of a theory (Allan, 2003:3).

In grounded theory, the theory is grounded in the data. Therefore, throughout the process of gathering data and analysing it, the researcher wrote memos to document what she learnt.

Memo writing provides explanations on the codes and it shows the relationships between the data. Memo writing assists the researcher to refine and expand more on the codes, so that categories and themes can emerge showing the relationship between categories and codes (Lawrence & Tar, 2013:33). Theoretical or purposeful sampling and constant comparison are key in generating grounded theory. Figure 5.2 below, taken from O'Hagan and O'Connor (2015:9), shows grounded theory data analysis steps. Grounded theory is a recursive method and not linear. Therefore, the steps are followed iteratively.

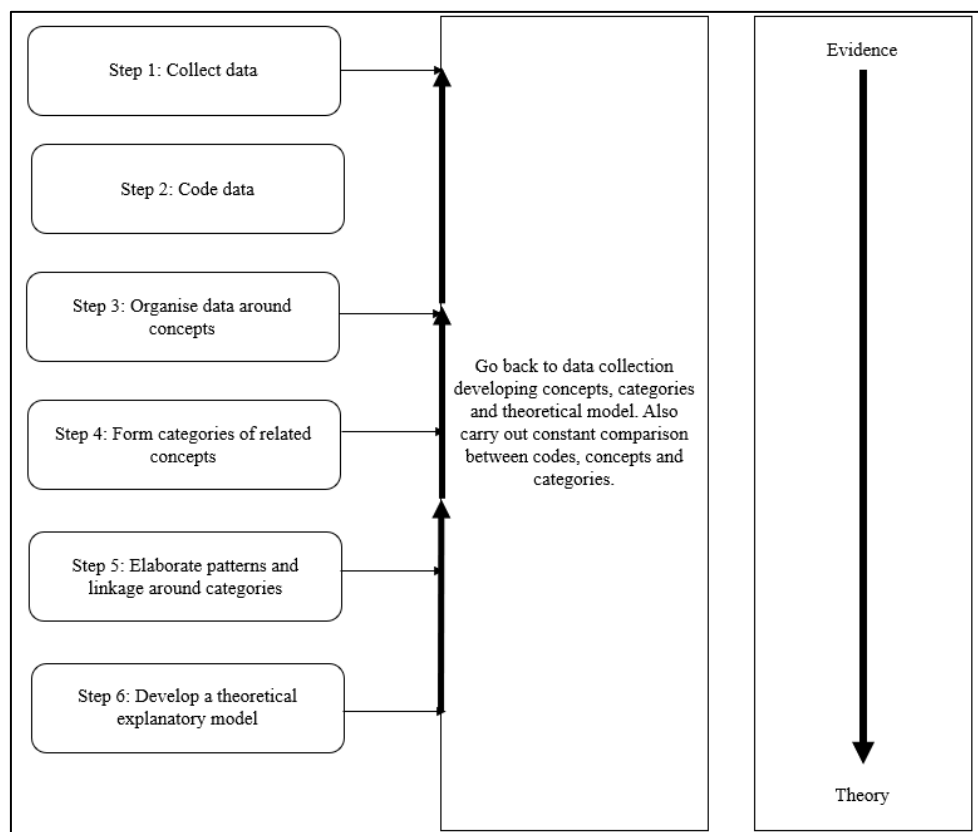


Figure 5.2: Grounded theory data analysis steps (O'Hagan & O'Connor, 2015:9)

5.4.1 Step 1: Collect data

The process of data collection was explained in Chapter 2. It involves preparing interview questions, theoretical and purposeful selection of participants, conducting interviews and memo writing. Interviews were transcribed by writing the responses from each participant on a word document. Once the interviews had been completed, the researcher transferred the answers to Microsoft Excel, so that the data could be organised in a more structured way for analysis and coding purposes. Table 5.3 below shows the transcribed raw data. For illustrative

purposes, part of participant P1's data is provided. From the excerpts provided in Table 5.3, it can be noted that follow-up questions were asked as and when the interviewer needed more information on the answer provided by the participant. One of the participants provided an answer to a question that he/she uses SharePoint for "*collaboration*" and the interviewer wanted to know more about collaboration by asking a follow-up question of "*How do you do collaboration on SharePoint?*"

Table 5.3: Raw data as transcribed during the interview

Interviewer: What is your main purpose for using SharePoint?
Participant P1: Sharing documents, compiling reports and saving them on the system, collaboration with other colleagues on the work we do.
Interviewer: How do you do collaboration on SharePoint
Participant P1: By collaboration I mean if there is a report to be compiled, I simply put it on SharePoint for everyone to edit instead of circulating and collecting data via email. This way, everyone can see anyone's input and comments
Interviewer: When requirements are gathered, to what extend are you involved?
Participant P1: I was only involved right at the end of the process, when the system was implemented for the business unit.
Interviewer: How were you involved?

5.4.2 Step 2: Code data

In grounded theory, the researcher does not only work with raw data. It is also broken down and given labels and meaning. Corbin and Strauss (1990:7) explain that, "theories can't be built with actual incidents or activities as reported, that is, from the raw data." The process of breaking down the data is called coding. Coding of data is based on the data that is most relevant to the research questions. Throughout the coding process, memos are used to explain the meaning of codes and to show similarities and differences in the participants' experience

(Charmaz, 2006:85). For example, Table 5.4 below shows a memo written after participant P3's interview.

Table 5.4: Memo written after participant P3's interview

Memo: after Participant P3 interview	P3's interview was an eye opener as new aspects were brought to the fore. Aspects like backup and training not offered were new compared to P1 and P2. There was also a conflicting information with regards to the manual being available as P1 mentioned that no manual was made available. Permission was also mentioned, which is a point mentioned by P2 as well. P3 thinks SharePoint is a great tool and no suggestions of improvements were made. He/she turns to the subject matter expert and the help desk for support on different issues.
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Using the constant comparison method, the researcher started coding from the first interview. The first coding that was carried out was pre-coding, as shown in Table 5.5. It shows an excerpt of the data that had been pre-coded by bolding and underlining text and capturing notes as initial codes.

Table 5.5: Pre-coded raw data and pre-coding notes

Pre-coded raw data from the interview	Pre-coding notes
The aim was to <u>move away from paper system to electronic system</u> and have documents <u>controlled</u> in a <u>centralised place</u> and <u>enable sharing</u> of documents. Also, to make reporting easy.	Digitise the paper system being used. Have one system that would enable management and sharing of documents centrally. When documents are in one central place, reporting will be made easy.
No, a lot of people are <u>still not using the system</u> and my view is that people <u>are not forced to</u> use it anyway. Sometimes when you ask people to save the information on SharePoint, it's like you are <u>forcing them to do something they don't like.</u>	System not being used by all employees because usage is voluntary. Usage is left to the users

Pre-coded raw data from the interview	Pre-coding notes
It has a <u>positive impact</u> as I'm able to <u>access</u> my documents <u>anywhere, anytime and anyone</u> can access the work I do in <u>real time</u> . This is a good thing for my manager as she doesn't need to wait for me to see <u>progress on my work</u> . It is making me to be <u>productive</u> .	Positive impact due to ease of access to information, information sharing and improved productivity.
My work involves getting data from various people and compiling reports for audits, so if everyone saves their data on the system on time then I can easily finalise the reports	Ease of information collection. Report compilation made easy. Central location to store data for ease of access
The ability to <u>configure and build systems</u> on SharePoint. I also like the fact that I can link <u>other systems for ease of access</u> .	Development and configuration of the user interface for ease of access
On SharePoint <u>I created a system</u> whereby employees can log incidents, assign the incidents via workflow to responsible people and capture feedback once the incident is closed	Development and configuration
Because he is <u>always available and willing to assist</u> . He is very <u>knowledgeable on the system and resolves my problems</u> . I know there are other channels like the <u>help desk</u> that I can use but it <u>takes time to get help</u> so I always go to the super user.	Availability. Knowledge of the system. Quick resolution. Other channels are slow on response time

Once the initial coding had been completed, the researcher broke down the data using Charmaz's analytical method of creating gerund. According to Charmaz (2008:406), gerund "depict actions and gives the reader a sense of people's intention and concerns." Gerund codes define the relationships between data and aids to makes the connections and patterns in the data. As the researcher continued with the interviews and coding, the gerund codes were compared, and new codes counted for each interview.

Below, Table 5.6 shows the number of new codes generated per interview. The purpose of the table is to show how data saturation was partially reached. A decline in generating of new codes was seen from P2's to P5's interviews. The researcher could not achieve data saturation, as she only had access to a set number of participants (eight) of whom five agreed to be interviewed.

This does not imply that the data are invalid. The study still provided rich data for the case that was studied. The total cumulative codes created is 71.

Table 5.6: Number of new codes generated per interview

Participants	New codes allocated	Cumulative codes
P1	44	44
P2	14	58
P3	8	66
P4	3	69
P5	2	71

5.4.3 Step 3: Organise data around concepts

The researcher used gerund codes as initial codes. Gerund refer to action verbs of the code, where ‘-ing’ is added to it for this purpose. Each interview transcript was coded using gerund. Table 5.7 shows an excerpt of the data with gerund coding. The use of gerund assisted the researcher in viewing the relationship between the data holistically and to form categories. Gerund that were more prevalent and continued to emerge throughout the interview fit into a specific theme.

Table 5.7: Gerund coding

Raw data from the interview	Pre-coding notes	Gerund coding (Initial)
My work involves interacting almost with everyone in the business unit so if I <u>save documents</u> on SharePoint, it then becomes <u>easy for others to access</u> materials like training certificates, training schedules etc.	Easy access to shared documents	accessing
<u>Not involved</u> at all	No involvement during requirements	users not participating

Raw data from the interview	Pre-coding notes	Gerund coding (Initial)
I mean I never gave anyone my requirements of what I want the system to do for me and <u>no one requested my input.</u> I was told by my superior to attend training because I should use the system to save company related information.	Input not requested, commanded to attend training and use the system	requesting user input not done, commanding training attendance
<u>More involved</u>	Willingness to get more involved	increasing end user involvement
I want to be more involved, so I can <u>give my input</u> as the implementers don't always know what I want the system to do for me.	Give input	giving input
My understanding is that it is a <u>one stop shop for [the company's] ¹ information</u> that everyone can access. It is one place where information is <u>available without having to go through other people to get it.</u>	one stop-shop for company information, convenient access to information	centralising information
The system makes it <u>easier for me to access</u> any company related information. <u>It saves me time of having to rely</u> on others for information.	Time saving, non-reliance on others	saving time, relying on others
<u>Most of the time yes,</u> but I know I still need to ask other people as not <u>everyone is using the system.</u>	not all information is available, some employees still not using the system	availability of information, using the system is voluntary

¹ The name of the company was removed for confidentiality

5.4.4 Step 4: Form categories of related concepts (intermediate coding)

Pandit (1996) explains that, “whereas open coding fractures the data into concepts and categories, axial coding puts those data back together in new ways by making *connections* between a category and its sub-categories (i.e. not between discrete categories which is done in selective coding). Thus, intermediate coding refers to the process of developing main categories and their sub-categories.” The main categories are derived from gerund codes. Codes of similar properties are grouped together into categories. Table 5.8 shows an excerpt from coding of categories using gerund.

Table 5.8: Coding of categories

Gerund Coding	Intermediate coding (categories)
Collaborating, sharing, reporting	Working together creates efficiency and saves time
Working together, co-creating	
Uninvolving end-users, not participating,	User involvement not defined
Increasing end user involvement	User willing to get involved and give input
Providing input, signing off requirements, assuming responsibility	
Making information available, convenient accessing of information	Availability and access to information, usage not encouraged and enforced
Using the system is voluntary	
Satisfying, benefiting, supporting	The system adds value to the users
Co-creating	
supporting more platforms on simultaneous editing, improving security access levels	Support of more platforms that enables co-creating

5.4.5 Step 5: Elaborate patterns and linkages between categories (Advanced or theoretical coding)

Categories are grouped together into themes, which are then further abstracted into theories. The researcher compared codes generated from the data collected through the interviews, using constant comparison to develop the core themes for the study. Example of theoretical codes generated for participant P2 are as follows: collaboration, user involvement, system use, system

value-add and relevance of training. The identified codes were compared with codes from other participants to form core themes.

5.4.6 Step 6: Develop a theoretical explanatory model

Through data analysis, taking into consideration the context around the answers provided by the participants, the theoretical proposition for all the answers was developed. The researcher wrote a theoretical explanatory model for answers provided by each participant and used constant comparison for all the theoretical models to devise one theory that encompasses all the responses from participants. User involvement is key in making sure that the system is used, and the use of the system is beneficial. For the system to be used, relevant and adequate training and support are required. A theoretical explanatory model for this research is presented in Chapter 6 as part of the recommended guidelines, as based on the theory that emerged from the data. The next section presents the interpretation of data by the researcher.

5.5 DATA INTERPRETATION

The purpose of this section is to report on the interpretation of the data analysed in Section 5.3. A constant comparative method was used to analyse the data. Once the coding had been completed, the researcher identified developing themes based on the data and wrote a theory statement. Themes are a representation of similarities and differences between the data. It supports the developed theory. In the case of this study, the theory refers to the developed guidelines and is discussed in Chapter 6.

5.5.1 Emerging themes

Table 5.9 shows the emerging themes after all the data were analysed and compared. There are fifteen identified themes in total. Themes were identified using a constant comparative method comparing codes from the answers given by participants. The researcher constantly compared new data that emerged from the interviews with data from previous interviews, searching for data that was repeated.

Table 5.9: Identified themes

Number	Identified themes
1	Self-motivation
2	Collaboration
3	User involvement
4	System use
5	System value-add
6	Relevance of training
7	Support choice
8	Backed up information
9	System security and backup
10	User education
11	Access to stored information
12	Support channels available
13	Co-creating
14	More user involvement
15	Undefined user involvement

5.5.2 Sub- themes

The fifteen themes in Section 5.4.1 were analysed further to determine which themes are core and which ones are sub-themes. Four core themes were identified, and each core theme has sub-themes as shown in Table 5.10 below. The sub themes were discussed as part of the core themes in Section 5.4.3.

Table 5.10: Themes and sub-themes

Themes	1. User involvement	2. System use	3. User education	4. Support Channels
Sub-Themes	1.1 More user involvement	2.1 Collaboration	3.1 Relevance of training	4.1 Support choice
	1.2 Undefined user involvement	2.2 Co-creating	3.2 Training approach	4.2 Support channels available

Themes	1. User involvement	2. System use	3. User education	4. Support Channels
		2.3 Access to stored data		
		2.4 System security or permissions		
		2.5 Backed up data		
		2.6 System value add		
		2.7 Self-motivation		

The next section presents the interpretation of the data for each core theme.

5.5.3 Core themes

5.5.3.1 Theme 1: User involvement

The interpretation of user involvement theme is based on the questions asked and the answers provided by participants. The answers that are taken into consideration are those that deal with the involvement of end-users. Codes were created as part of the analysis of data collected from participants. With the constant comparison analysis, the initial codes are compared to find categories. Below, Table 5.11 shows the frequency of the codes as mentioned by participants in their responses.

Table 5.11: Frequency of codes under theme 1: user involvement

User involvement codes	P1	P2	P3	P4	P5	Total
More user involvement required	1	1	1	1	1	5
Users to give input into the requirements	1	1	1	1	1	5
Users to sign-off the requirements	0	1	0	0	1	2
User involvement is not defined	1	0	0	1	1	3
Total	3	3	2	3	4	15

The theory that emerged from the data is that users would like to be more involved by giving inputs into the requirements that will be used to build the system. One-hundred percent of the participants indicated that more user involvement is required. It is vital for users to be involved in the early stages of the project when requirements are gathered. The involvement should not

end at the requirements gathering stage, but it should be continuous. End-users are more than willing to get involved if they are given a chance to do so. All five participants mentioned that they would like to be “more involved” in the requirements gathering stage, however, participant P3 recognised that not all users can be involved. P3 had the following to say: “I’m never involved, I think it’s because SharePoint is used by the whole company, so the requirements are gathered from some users not all users. The only issue I have is I don’t know who represent my business unit at the stage of gathering requirements.” The statement made by P3 correlates with the statement made by P5 who said, “I have no idea who gave the requirements.” Even though P3 recognised that not all users can be involved, it is confirmed that those who are involved must be known and if other users would like to give input, they can do so via a representative.

One of the hitches mentioned by participants is that user involvement is not defined. Participants are unsure of whether they need to approach the team to give input into the requirements or if input is supposed to be requested from them. Participant P4 said, “I mean I never gave anyone my requirements of what I want the system to do for me and no one requested my input.” P5 also concurred with P4 that the process of requirements gathering is unclear by stating “Even now when I have ideas on how to improve the system, I’m not sure who to contact.”

User buy-in is key in making sure that the system is used. Sixty percent of the participants indicated that they are more than willing to take ownership of the system. P5 said, “I want to own the system as the user” and P5 stated, “I need to have an input and also sign off on the requirements.” Signing-off requirements and taking ownership mean users agree with the objective of the system and they will be the ambassadors for the system.

5.5.3.2 Theme 2: System use

The second theme is system use. The system can only be deemed a success or failure if it is used or unused. With KMSs, system use is influenced by many factors such as understanding one’s contribution to the needs of others and the expectation of what one can get out of the system. Knowledge management (KM) cannot succeed with only a few people using the system; it is a concerted effort. Table 5.12 below shows the frequency of codes as mentioned by participants in their responses.

Table 5.12: Frequency of codes under theme 2: system use

System use	P1	P2	P3	P4	P5	Total
Collaboration	1	1	1	1	1	5
Co-creating	1	1	0	1	1	4
Accessing information	1	0	1	1	1	4
Permissions	0	1	1	0	1	3
Back-up	0	0	1	0	1	2
Positive impact	1	1	1	1	1	5
Usage is voluntary	1	1	1	1	1	5
Total	5	5	6	5	7	28

The reasons for using SharePoint mentioned by participants vary. All participants mentioned that they use the system for collaboration, and they all believe SharePoint has a positive impact on their day-to-day job. The fact that some users are not using the system is a concern raised by all participants. P1 mentioned that, “a lot of people are still not using the system and my view is that people are not forced to use it anyway” while P3 said, “That’s another issue, some employees still don’t use SharePoint and sometimes it is frustrating because the information I need is not available and I have to revert back to asking people to share the information with me.” KMSs must be used by all to be effective.

Functionalities of the system also have an impact on the use of a system. Permissions and backup are some of the functionalities mentioned by participants P2, P3 and P5 as the motivation for using SharePoint. P3 said, “Not losing documents as the system is backed up unlike when it is saved on a desktop. Another thing I like is the permission functionally. If I have confidential information, I can restrict access to the unauthorised people” while P5 said, “Another thing is I have a peace of mind when I save documents on the system because they don’t get lost as the system is backed up and can be accessed anywhere anytime by anyone with the right level of access.”

All participants asserted that the system does add value to their day-to-day job. Below are some of the quotes from participants.

P1 – “It has a positive impact as I’m able to access my documents anywhere, anytime and anyone can access the work I do in real time. This is a good thing for my manager as she doesn’t need to wait for me to see progress on my work. It is making me to be productive.”

P2 – “Using SharePoint makes my job easy because the people I support are based in different locations and for me to support them I use SharePoint for collaboration.”

P3 – “It makes my life easy as I can easily share a link to the documents, I want to share with other people instead of attaching documents that can take too much space on emails. I can also easily search information without depending on others to provide it. I do a lot of analytical work which required information from other people, with SharePoint I don’t need to wait for them to share it with me.”

P4 – “The system makes it easier for me to access any company related information. It saves me time of having to rely on others for information.”

P5 – “Being able to access information without asking other people to share it. Another one is being able to save information which I know can be used by my colleagues.”

5.5.3.3 Theme 3: User education

User education covers training and change management. For users to understand the purpose of the system and how to use it, knowledge transfer must take place. Knowledge transfer can take many forms such as training, training manual, help-desk support etc. Table 5.13 below shows the codes created under user education and the frequency as mentioned by participants.

Table 5.13: Frequency of codes under theme 3: user education

User education	P1	P2	P3	P4	P5	Total
Access to information	1	1	1	1	1	5
Training insufficient	1	1	1	1	1	5
Training attended	1	1	0	1	1	4
Manual provided	0	0	1	0	0	1
Total	2	2	2	2	2	15

There are some commonalities in the understanding of the aim of SharePoint amongst participants. Some of the points mentioned by participants include access to information, sharing of information and working together to share ideas. P2's response summarises all the participants' responses: "The aim is to make information readily available for employees to access anywhere anytime." Knowledge management is made possible by capturing, storing, accessing and sharing of information. For end-users to clearly understand the aim and objective of a system, user education through change management, training and workshops must take place.

Only one participant mentioned that training was not attended. All four the other participants attended some sort of training. The type of training offered differed between all the four participants however they all mentioned that the training received was not satisfactory and sufficient. P5 said, "The training was very quick and added little value. Everything was rushed through." P4 mentioned that, "There was no value add on the training as it didn't address my needs, I have to find my way around the system to understand it better." P1 stated, "information was too much for 1 day; the training was rushed as there was a lot to cover. I would have appreciated more days to cover important things."

The approach and relevance of training are coming into question as no participant was satisfied with the training offered. P5 even suggested that, "the trainer should have asked for our input" before the training. Some participants attended one full day, some a half day and one even attended a refresher training. It is not clear how the training was approached. Knowledge transfer for any system is crucial in making sure that the systems are used for its intended purpose.

Theme 4: Support channels

All systems evolve and unfortunate situations can be experienced by those who use the systems. Theme number four outlines the importance of support channels that are made available to the users. All participants recognise that support is an integral part of using the system and deriving benefits. They all mentioned that they have someone or somewhere to turn to for support.

Table 5.14 below shows the frequency or counts of codes under the theme support channels.

Table 5.14: Frequency of codes under theme 4: support cannels

Support Channels	P1	P2	P3	P4	P5	Total
Help desk	0	0	1	0	0	1
Colleagues	0	0	1	0	0	1
Consultants	0	1	0	0	1	2
Subject matter expert	0	0	0	1	0	1
Super user	1	0	0	0	0	1
Total	1	1	2	1	1	6

Support can be in the form of formal channels such as the help desk or informal channels like reaching out to other colleagues. The biggest factors that influence which support channels to use as mentioned by some of the participants are turnaround time, accessibility, flexibility, perceived knowledge of the system, willingness to assist, availability and available contact channels. Both P2 and P5 prefer getting support from the consultant while P1, P3 and P4 choose different people. P1 prefers the super user, P3 use both the help desk and colleagues and P4 chooses to contact the subject matter expert.

The help desk is not the first and preferred choice for participants for various reasons. P5 said, “I know I can log calls with the help desk, but it also takes long to get a response.” The responses from P1, P2 and P4 were similar to that of P5 citing the response time as the big factor that influences who to contact.

P1 – “I know there are other channels like the help desk that I can use but it takes time to get help so I always go to the super user.”

P2 – “I know I can log a call with the help desk, but the process takes too long to get a resolution.”

P4 – “I can log a call with the help desk, but the response time is not as fast compared to when I contact the subject matter expert directly.”

Participant P3 had a classification on what type of issues she reports to the help desk for support. She said, “for simple things like if I don’t know how to use a certain functionality and it is not clear in the manual, then I ask my colleagues. But if it’s a technical issue like an error on the system then I use the help desk to log a call.”

Support channels offered to users must be adequate and well equipped to meet the end user's expectations. If all channels can meet the expectations of end-users, then users will always know who to contact and for what.

5.6 SUMMARY

In this chapter, the researcher explained how participants were interviewed and raw data captured. The questions used for the interviews were open ended questions, developed as per Chapter 2. The method of interviews used was face-to-face, one-on-one structured interviews where participants were asked the same questions with follow-up questions where necessary. The purpose of the interview was to gain an understanding of the perspective of the end-users on the intended use of KMSs. Participants were selected on the basis that they were the active users of the system at the time of the study.

Interview transcripts were recorded on a word documents and later transferred to Microsoft Excel for analysis and data interpretation. Data was analysed using constant comparative method where data gathered from participants was compared to find categories of related concepts. Related categories were further grouped together to develop theoretical themes. The themes were unpacked based on the questions asked and answers provided by participants. The interpretation of the data was presented per identified themes. For this research, there is no explanatory model and there are no propositions.

The next chapter presents the conclusion of the research as well as the theory and recommended guidelines on how to improve the use of KMSs, as intended from the perspective of the end-users.

CHAPTER 6: CONCLUSION

6.1 INTRODUCTION

The aim of this study was to understand the perspective of end-users regarding the intended use of the knowledge management systems (KMSs) that they use, to develop and propose guidelines for improved use, i.e. as intended. The purpose of this chapter is to present the guidelines rooted in the data collected from participants. The research objectives are revisited to determine if the objectives, as outlined through the various chapters, were achieved. The rigor of the research is evaluated against the recommended principles for grounded theory. Assumptions considered throughout the study are explained as well as the limitations experienced. The researcher further proposes recommendations for future studies.

This chapter is organised as follows: the research objectives of this study are revisited in Section 6.2. to show the alignment of the research to the objectives as outlined in Chapter 1; Section 6.3 presents the rigor of the research methodology; proposed guidelines for improving the use of KMSs are presented in Section 6.4; Section 6.5 presents the proposed list of guidelines; the assumptions and limitations encountered by the researcher throughout the study are presented in Section 6.6; recommendations for future studies are discussed in Section 6.7 and the chapter concludes with a summary in Section 6.8

6.2 RESEARCH OBJECTIVES REVISITED

The aim of this study was to understand the perspective of end-users regarding the intended use of knowledge management systems (KMSs) that they use, to develop and propose guidelines for improved use, i.e. as intended. The guidelines were based on the data collected from participants through the interviews. The analysis of data in Chapter 5 resulted in the themes and the themes contributed to the development of the guidelines as emerging theory for the study. How the study achieved the theoretical and empirical objectives is discussed next.

6.2.1 Theoretical objectives

1. Present a literature review on research approaches, encompassing research paradigms, methodologies and methods.

The researcher presented the four research paradigms mostly used in IS research based on their ontological and epistemological positions as well as the methodologies and methods they subscribe to in Chapter 2. The research paradigm chosen for this study was interpretive. Methodologies used in interpretive studies were presented in Chapter 3 and the selected methodology for this study was grounded theory. Justification for the research methodology was presented in Chapter 3.

2. Present a literature review on intended use of IS, focusing on KMSs.

Chapter 3 presented a literature review on information systems (IS) including the process of introducing IS in the organisations. Literature reviews on system use, intended use of IS, usage measures, as well as approaches for measuring system usage in relation to KMSs were also presented in Chapter 3.

3. Present background on the organisational objectives of the KMS being investigated.

Chapter 4 introduced the organisation where the study was undertaken. The background on the organisational aim and objectives of the KMS employed was presented. The process followed to implement and rollout the KMS was explained. The benefits of implementing the system as envisaged by the company were also presented.

6.2.2 Empirical objectives

1. Collect and analyse gathered data to find the perspective of the end-users in relation to a KMS and its intended use, in order to formulate guidelines to improve use.

The interview questions as well as the process followed to select participants were explained in Chapter 2. Data was collected and analysed through the interpretive method of enquiry using grounded theory in Chapter 5.

2. Formulate and present the guidelines.

Guidelines were presented as part of Chapter 6. The guidelines were rooted in the data collected from participants. The guidelines presented were derived from the themes that emerged from the gathered data and analysed in Chapter 5.

Rigor of the research methodology as applied is presented next.

6.3 RIGOR OF THE RESEARCH METHODOLOGY

Birks *et al.* (2013:2) proposed guidelines that must be followed by researchers to assess their research against the principles of grounded theory methodology. The guidelines were presented in Chapter 2. In this section, the researcher revisits the guidelines and presents evidence that the guidelines were incorporated as part of the overall research.

6.3.1 Theory development

With grounded theory methodology, the theory must be rooted in the data and it must provide a rich description of the phenomenon. The researcher analysed the data collected from the interviews and no other data was included. The guidelines were developed based on the data analysed in Chapter 5.

6.3.2 Constant comparison

The data collection process for this study was iterative. Participants were not interviewed on the same day, in order to allow the researcher to analyse the gathered data before the next interview. After each interview, the researcher analysed the data. The questions were not revised but asked as per the questions posed in Chapter 2. New data from the interviews was constantly compared to data from previous interviews.

6.3.3 Iterative coding

In grounded theory, data coding is not finalised in one step, but it is an iterative process. To derive a context out of data, it must be refined and granulated to an acceptable level. To refine and granulate the data, the researcher used pre-coding notes followed by gerund as initial coding. Initial coding was followed by intermediate coding which resulted in categories being extracted from the data. The last coding that was done was advanced coding where categories were grouped together into themes, which were then further refined into theories.

6.3.4 Purposeful sampling

Purposeful sampling can inform or predict the emergence of the next data to be collected. For this research, as the researcher conducted the interviews to collect the data, the data collected was analysed through coding and the data analysed was constantly compared.

6.3.5 Management of preconceptions

To avoid preconceived ideas, the researcher's line of questioning was solely based on the research aim and objectives, which was to understand the perspective of the end-users with regard to the intended use of KMSs, in order to propose guidelines to improve the use thereof.

6.3.6 Inextricable link between data collection and analysis

Data collection and analysis cannot be carried out separately from each other. Data is collected, then analysed. Based on the analysis, new themes emerge and therefore new data might need to be collected and analysed. This is an iterative process that cannot be decoupled. For this research, after each interview, the researcher wrote memos to summarise the overall outcome of the interview. Data was then analysed through pre-coding, gerund, initial, intermediate and advanced coding to deduce the categories, sub-categories, themes and sub-themes. A process of constant comparison was followed through the comparison of data from the new interviews with the data from previous interviews.

6.4 PROPOSAL GUIDELINES

This section presents the guidelines based on the themes that emerged from the analysis of the data collected from participants in Chapter 5. The main aim of the study was to propose guidelines that can be used to improve the use of KMSs, as intended. The proposed guidelines are based on the four themes which are user involvement, system use, user education and support channels. The proposed guidelines are presented and discussed next.

6.4.1 Proposed guideline one (user involvement)

Data analysed in Chapter 5 revealed that users are more than willing to get involved during the project and post implementation for continuous improvement of the system. However, they can only get involved if they are given a chance or invitation to do so. If they are involved, they

will assume ownership of the requirements and the system. Assuming ownership means users agree with the aims and objectives of the system and that they will be the change agents for the system.

The first proposed guideline is: **User involvement ought to be clearly defined, documented and communicated with all the stakeholders, so that they understand and know what is expected of them and at what stage their involvement will be required.**

6.4.2 Proposed guideline two (system use)

Data collected and analysed in Chapter 5 showed that the level of impact that the system has on the day-to-day activities performed by the end-users influences the use of the system. The data revealed that for KMSs, unavailability of information when a user is looking for it has a potential of deterring the user from using the system in the future. Unavailability of information is experienced as a result of the system not being used. The issue that was revealed from the data was that system use is not enforced.

The second proposed guideline is: **The intent of the overall system as well as the intent of each functionality ought to be defined and recorded. The records must be communicated and made available to all the stakeholders. System use must be enforced by those who have the power to do so.**

6.4.3 Proposed guideline three (user education)

Based on the data analysed, users view knowledge transfer through training and change management as a key factor in understanding the purpose of the KMS and what is expected from them. Knowledge gained through training and change management influences users' adoption of the system. The data revealed that training was inconsistent as some users attended training and some did not. Those who attended all mentioned that training was insufficient. The data also showed that the understanding of the aim and objective of SharePoint was consistent amongst the participants.

The third proposed guideline is: **User education through training must be consistent and made available to all the users. Users must be given a chance to share their training expectations and this must be incorporated in the training materials.**

6.4.4 Proposed guideline four (support channels)

According to the analysed data, the support channels used by the end-users vary. The choice of preferred support channels by the end-users is influenced by many factors. From the data, the factors included turnaround time, accessibility, flexibility, perceived knowledge of the system, willingness to assist, availability and available contact channels. The data also revealed that the formal support channels are mostly not preferred due to poor turnaround time to get assistance.

The fourth proposed guideline is: **Adequate and relevant support channels must be made available to the users. Formal support channels ought to be aligned with the expectations of the users.**

6.5 ASSUMPTIONS AND LIMITATIONS

The assumptions for this research were that participants had sufficient knowledge on the nominated KMS (SharePoint) and that they were actively using the system. A limitation experienced during the study was that data saturation could not explicitly be reached due to the availability of a limited number of participants. However, the study serves as valuable case in the organisation where it was conducted, and rich data was gathered. The researcher was able to formulate guidelines applicable to this company and can now expand on these in future.

6.6 RECOMMENDATIONS FOR FUTURE STUDIES

The researcher employed the abbreviated version of grounded theory where the original set of collected data was used because of the social setting of the organisation where the research was conducted. A recommendation for future studies is that the full version of grounded theory be applied to cover a bigger spectrum of the users of KMSs. The researcher chose one system, which is SharePoint, as the subject for data collection and analysis. For future research, various KMSs can be investigated to get even richer data instead of nominating one system.

6.7 LIST OF GUIDELINES

The list of guidelines is as follows:

1. User involvement ought to be clearly defined, documented and communicated with all the stakeholders, so that they understand and know what is expected of them and at what stage their involvement will be required.
2. The intent of the overall system as well as the intent of each functionality ought to be defined and recorded. The records must be communicated and made available to all the stakeholders. System use must be enforced by those who have the power to do so.
3. User education through training must be consistent and made available to all the users. Users must be given a chance to share their training expectations and this must be incorporated in the training materials.
4. Adequate and relevant support channels must be made available to the users. Formal support channels ought to be aligned with the expectations of the users.

6.8 SUMMARY

This chapter concluded the study undertaken by the researcher to understand the perspective of end-users regarding the intended use of KMSs that they use, to develop and propose guidelines for improved use, i.e. as intended. The chapter reported how the objectives of the study were achieved. The four proposed guidelines to improve the use of KMSs as intended were presented in this chapter.

Rigor of the research was assessed against the guidelines for conducting a grounded theory research. Assumptions and limitations to the research were presented. This chapter concluded with the recommendations for future studies.

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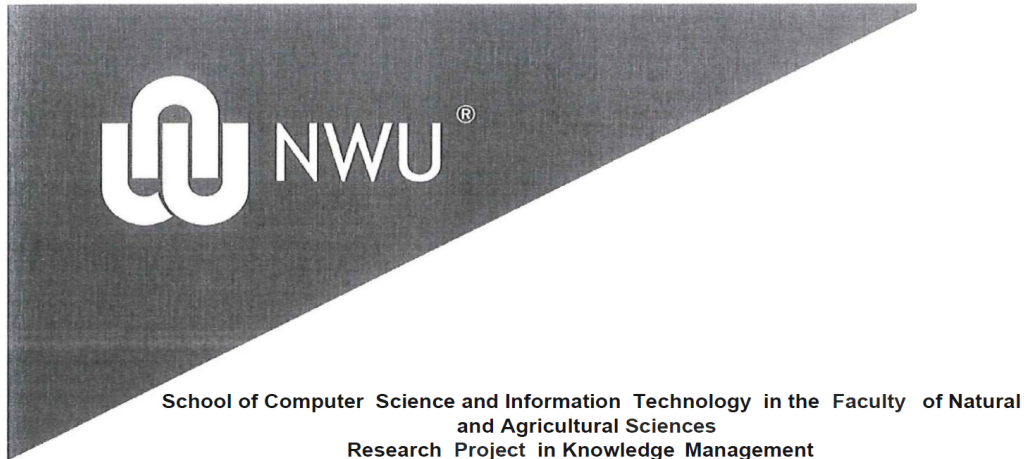
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Appendix A: Organisation's consent form

Permission to conduct research was granted by the organisation where the research was conducted by means of a signed consent form.



Research conducted by: PL Mmatloa (24403156)

Dear Sir

The purpose of this letter is to inform you of the aim of the study and to obtain permission to do the research in your organisation. The study will be conducted by Phora Mmatloa, a Masters (MSc) student from the school of computer science and information technology at the North-West University (NWU).

The study has been approved and funded in full by the study aid programme.

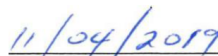
The primary objective of the study is: To develop guidelines to improve the use of knowledge management systems as intended. The aim is to improve the creation, capture, categorisation, access and use of information assets through knowledge management systems.

Please note the following:

- The study will involve anonymous interviews. Names of the individuals and the name of the company will not appear in the findings; answers and findings will be treated as strictly confidential. Participants will not be identified in person on the answers they provided.
- Participants may choose not to participate and may also stop participation at any time without any negative consequences.
- The results of the study will be used for academic purposes only and may be published in an academic journal. The summary of the findings will be provided to the company on request.
- You may contact me or my study supervisor, Dr C Venter, Carin.Venter@nwu.ac.za if you have any questions or comments regarding the study

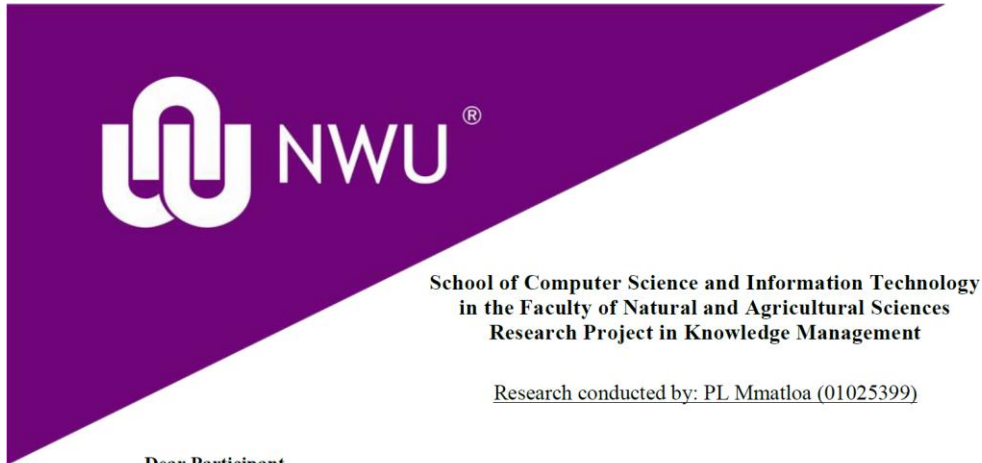
Kindly sign the form to indicate that you give permission for the study to be in your organisation, subject to the confidentiality agreements stipulated above.


Signature


Date

Appendix B: Participant's consent form

Permission was obtained from participants to participate in the interviews.



Dear Participant

The purpose of this letter is to inform you of the aim of the study and obtain your permission for an interview to gather data for the research. The study is conducted by Phora Mmatloa, a Masters (MSc) student from the school of computer science and information technology at the North-West University (NWU).

The primary objective of the study is: To develop guidelines to improve the use of knowledge management systems as intended. The aim is to improve the creation, capture, categorisation, access and use of information assets through knowledge management systems.

Please note the following:

- The study involves anonymous interviews. Your names and the name of the company will not appear in the findings; answers and findings will be treated as strictly confidential. As a participant, you will not be identified in person on the answers you provide.
- The questions are open ended and there is no right or wrong answer. The questions have been designed to get an understanding of your experience as a user of knowledge management systems. The answers you provide will be read back to you once captured to get your conformation of a true reflection of what you said.
- Please feel free to ask for clarity where you don't understand the question. You may choose not to participate and may also stop participation at any time without any negative consequences.
- The results of the study will be used for academic purposes only and may be published in an academic journal.
- Please feel free to contact me or my study supervisor, Dr C Venter, Carin.Venter@nwu.ac.za if you have any questions or comments regarding the study.

Statement of consent:

I have read the above information. All my questions have been answered to my satisfaction. I give the researcher permission to interview me and capture the transcript of the interview on a document, subject to the confidentiality agreements stipulated above.

Participant's Signature

Date

Researcher's Signature

Date

Appendix C: Email invite sent to participants

A sample of the email invitation sent to participants:

The screenshot shows a Microsoft Outlook meeting invitation interface. The top ribbon includes tabs for Cancel Meeting, Forward, Appointment, Scheduling Assistant, Tracking, Skype Meeting, Meeting Notes, Contact Attendees, Address Book, Check Names, Response Options, Reminder (set to 15 minutes), Recurrence, Time Zones, Room Finder, Categorize, High/Low Importance, and Insights. The main area displays the following details:

- To:** [Redacted]
- Subject:** Research data gathering interview
- Location:** HR Small Boardroom
- Start time:** Tue 5/28/2019, 3:00 PM
- End time:** Tue 5/28/2019, 4:00 PM
- Attachments:** Research Questions Phora Mmatloa 24403156.docx (23 KB), Permission to conduct research - Phora Mmatloa Signed.pdf (728 KB)

The body of the email contains the following text:

Hi [Redacted]

I trust you are well. I'm currently studying towards my Master's Degree in computer science. **The primary objective of my research is :** To develop guidelines to improve the use of knowledge management systems as intended. The aim is to improve the creation, capture, categorisation, access and use of information assets through knowledge management systems.

As a user of Sharepoint (which is one of the knowledge management systems used in [Redacted]) would like to request 1 hour of your time to get your input on how Sharepoint can be utilised better from your perspective.

Kindly find attached permission to conduct research for reference and the sample of the questionnaire

Please feel free to ask any questions, Looking forward to hearing from you.

Kind Regards,

On the right side, there is a 'Room Finder' pane showing a calendar for May 2019 and a list of suggested times (None).