MINI DISSERTATION

Impact and Evolving Use of Knowledge Management Technologies in State-Owned Companies

By

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200303680

Submitted in Fulfilment of the Requirements for the Degree

MAGISTER TECHNOLOGIAE: BUSINESS INFORMATION SYSTEMS

in the

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY

at the

TSHWANE UNIVERSITY OF TECHNOLOGY

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August, 2016
ACKNOWLEDGEMENT

Special thank you go to everyone for the generous support I have received, which has made accomplishment of this dissertation possible that led this academic assignment to become a reality. The kindness and encouragement from different people in completing this mini dissertation will forever be appreciated.

Therefore, I wish to express my greatest sincere appreciation and gratitude to the following individuals who supported me in completing this study:

- My study supervisor, Prof Blessing Mbatha, for his tireless support, direction and valuable guidance throughout the course progress and completion of this dissertation
- The co-supervisor, Mr Pieter Pretorius, for his advice and patience which significantly contributed to the completion of the research cycle.
- Transnet EIMS & IMS Management for granting me permission to conduct this study in their department.
- Colleagues from Transnet who made time for me to conduct interviews
- The research participants who shared their views and experiences about the subject matter with me.

Finally, I would like to thank everyone who contributed in any form to make this research study possible. I thank you all!
DECLARATION

I hereby declare that this dissertation submitted for the degree MTech: Business Information Systems, at Tshwane University of Technology, is my own work and that it has not previously been submitted by me or any other person for assessment to any other University or for another qualification. I further declare that references from this study have been cited or acknowledged accordingly.

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ABSTRACT

The study sought to explore the impact and evolving use of knowledge management technologies at Transnet. The research problem that was investigated in this study emanated from various initiatives within Transnet from different business areas or units. These initiatives use or require specialised skills and knowledge. However, the researcher noted with concern that knowledge creation, preservation, transfer and sharing are amongst key challenges that need to be addressed at Transnet. To achieve the abovementioned aim, the study addressed the following objectives: to describe the impact and use of knowledge management technologies; to discover the different methods for retaining tacit knowledge through converting tacit knowledge into explicit knowledge and close the process gaps; and to discover an effective knowledge management system for capturing and retaining knowledge which will result in improved decisions making and cost savings.

The study was informed by the Activity Theory. The study adopted a qualitative case study approach because the researcher wanted to involve a deep understanding through multiple types of data sources. The findings show that Transnet has adopted different types of technologies in its operations to process, store, present and communicate information. Also ICT applications such as SharePoint were adopted to store documents such as shared repository. Likewise, e-mails and Group SMS were used to communicate urgent matter to the employees. The findings depict that KMTs provide a number of advantages to the organisation and have proved to be catalysts
when it comes to improving communication, accessing information, sharing information, retrieving information, and disseminating information. The study recommends that training be provided to ensure that all employees are able to use KMTs effectively.

*Keywords: Knowledge Management Technologies, Impact, Evolving Use, State-Owned Companies.*
TABLE OF CONTENTS

ACKNOWLEDGEMENT ........................................................................................................... ii
DECLARATION ......................................................................................................................... iii
ABSTRACT .............................................................................................................................. iv
LIST OF FIGURES .................................................................................................................. ix
LIST OF ACRONYMS ............................................................................................................. x
CHAPTER ONE ....................................................................................................................... 1
INTRODUCTION AND BACKGROUND TO THE STUDY ..................................................... 1
  1.1 INTRODUCTION TO THE STUDY ................................................................................ 1
  1.2 BACKGROUND TO THE STUDY .................................................................................. 5
  1.3 RESEARCH PROBLEM ............................................................................................... 7
  1.4 AIM OF THE STUDY ................................................................................................... 8
  1.5 OBJECTIVES OF THE STUDY ..................................................................................... 8
  1.6 RESEARCH QUESTIONS ............................................................................................. 9
  1.7 JUSTIFICATION OF THE STUDY ............................................................................... 9
  1.8 CONTRIBUTION OF THE STUDY .............................................................................. 10
     1.8.1 Theoretical contribution ....................................................................................... 10
     1.8.2 Practical contribution .......................................................................................... 10
  1.9 DEFINITION OF TERMS ............................................................................................ 10
  1.10 RESEARCH DISPOSITION ....................................................................................... 11
  1.11 SUMMARY ............................................................................................................... 13
CHAPTER TWO ....................................................................................................................... 14
LITERATURE REVIEW .............................................................................................................. 14
  2.1 INTRODUCTION ......................................................................................................... 14
  2.2 KNOWLEDGE MANAGEMENT DEFINED ................................................................ 15
     2.2.1 Knowledge management cycle .......................................................................... 17
  2.3 KNOWLEDGE MANAGEMENT TECHNOLOGIES DEFINED .................................. 18
  2.4 IMPACT OF KNOWLEDGE MANAGEMENT TECHNOLOGIES ............................. 19
  2.5 EVOLVING USE OF KNOWLEDGE MANAGEMENT TECHNOLOGIES ........... 21
  2.6 TACIT KNOWLEDGE RETENTION .......................................................................... 25
  2.7 TACIT KNOWLEDGE CONVERSION ....................................................................... 27
  2.8 EFFECTIVE KNOWLEDGE SHARING PLATFORM – METHODS AND PROCESSES ......................................................................................................................... 31
     2.9 Effective and efficient KMTs result in enhanced service delivery ...................... 33
LIST OF FIGURES

Figure 1: Knowledge Management Cycle .............................................. 18
Figure 2: Integrated dynamic knowledge model .................................... 29
Figure 3: A basic structure of an activity ............................................. 40
Figure 4: Research themes ................................................................. 53
Figure 5: Conceptual framework for KMTs in this study ...................... 82
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KMTs</td>
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</tr>
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<td>KM</td>
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<td>State Owned Companies</td>
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<td>Human Capital Management</td>
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<td>Market Demand Strategy</td>
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<td>TFR</td>
<td>Transnet Freight Rail</td>
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<td>ICT</td>
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<td>SECI</td>
<td>Socialisation, Externalisation, Combination, Internalisation</td>
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<td>CRM</td>
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CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

This chapter provides the background to the study and details the problem statement, aims, objectives and research questions. The chapter also outlines the justification of the study, as well as the contribution of the study. It also outlines the study structure.

1.1 INTRODUCTION TO THE STUDY

Knowledge management technologies (KMTs) play a significant role in supporting knowledge workers in the organisation at an operational level (Mbatha, 2015). Thus, KMTs are used to enable technology to provide the knowledge employees need to perform a specific task as efficiently as possible (Mbatha, 2013). This requires a careful and smooth integration of knowledge management technologies with business process management tools. It is important to note that when discussing KMTs, one has to talk about knowledge workers because without these people, there might be no KMTs. To this end, Davenport (2013) defines knowledge workers as employees with high degrees of expertise, education or experience, and their primary purpose in the organisation involves the creation, distribution and application of knowledge. In support of the views above, Drucker (2013) describes knowledge workers as ‘individuals who know more about their job than anyone else in the organisation.’

Drucker (2013) further observes that the earlier knowledge management technologies were online corporate yellow pages (expertise locators) and document management
systems, which were later combined with the early development of collaborative
technologies (in particular Lotus Notes), then KMTs expanded in the mid-1990s;
particularly, the use of semantic technologies for search and retrieval and the
development of knowledge management specific tools such as those for communities
of practice (Drucker, 2013). Lately, social computing tools such as blogs and wikis
have advanced to provide a more unstructured, self-governing approach to the
transfer, capture and creation of knowledge through the development of new forms of
community, network or environment (Mbatha, 2015). However, the KMTs face
challenges in refining meaningful re-usable knowledge and intelligence information
which will ensure that their content is transmissible through diverse channels,
platforms and forums (Davenport, 2013; Drucker, 2013).

The KMTs include but are not limited to the following: Intranet and internet, groupware
– lotus notes, intelligence agents, experts systems, knowledge base, corporate and
knowledge portals, data mining, decision-support systems, content and document
management, customer relationship management (CRM) and customer-support
technology (Davenport, 2013; Drucker, 2013). In line with the views above, Borghoff
and Pareschi (2013) state that KMTs should formalise only knowledge which is stable
and sanctioned. According to these authors, stability is defined as the rate of change
in the domain being demonstrated, relative to the speed with which these changes can
be noticed. Thus they add that as organisational structures change, as teams change,
as employees skills change knowledge becomes unstable. It is important to note that
this simply suggests that in principle, as improvements in the flexibility of knowledge
representation are made, the linkage between the model and the domain being
modelled could become tighter so that more dynamic classes of knowledge can be
managed. Work practices become stable because they are sanctioned and sustained by the relevant stakeholders (Borghoff & Pareschi, 2013).

It is, therefore, important to note that the main focus of this study is to explore the impact and evolving use of knowledge management technologies at Transnet in Gauteng Province. Basically, the study seeks to explore different methods and processes that have been adopted by Transnet to convert tacit to explicit knowledge. In addition, the study sets out to explore methods of retaining tacit knowledge, knowledge sharing and collaboration, how organisational culture can influence knowledge creation, sharing and transfer at Transnet. The rationale behind this aim is to enable the study to come up with effective ways of converting tacit into explicit knowledge.

It is worth mentioning that the research problem that was investigated in this study emanated from various initiatives within Transnet from different business areas or units. These initiatives use or require specialised skills and knowledge. However, the researcher noted with concern that knowledge creation, preservation, transfer and sharing are amongst key challenges that need to be addressed at Transnet. Suffice to say supporting the Transnet philosophy ‘one company, one vision’, the knowledge and skills need to be managed and shared across the entire organisation to improve efficiency, productivity, innovation, and creativity. The researcher’s interest in knowledge management (KM) stems from the fact that Transnet has not yet found definite benefits in KMTs. In recent times, there is no denying the fact that KM has begun to feature as one of the most critical activities effectual for business excellence. With the advent of global attention organisations cannot continue to ignore their
learning capacity. It is important to note that, it is crucial for building and sustaining the organisation’s competencies through making knowledge available to the right people at the right time (Davenport, 2013; Mbatha, 2013; Drucker, 2013).

The main ingredient in upholding a competitive advantage in the current dynamic and demanding marketplace is through continuous innovation. According to Tyagi, et al. (2015), continuous improvement needs an organisation to constantly update and create knowledge for the current generation, and re-use it later for the next generation of a product. On the other hand, Dalkir (2011) indicates that the effective knowledge management needs an organisation to identify, generate, diffuse, and capture the benefits of knowledge that gives a strategic advantage to that organisation. This process, however, requires specific roles of knowledge development and management. The process will play a huge role in creating new knowledge as well as the application, transforming and integration of existing knowledge (Shokrzadeh, et al., 2012).

There are many challenges, however, in selecting the right information from various sources and convert or transform it into useful knowledge. As things stand, it should be safe to note that Transnet needs to continuously create a knowledge sharing culture through a centralised environment to encourage the open sharing and use of knowledge. The following knowledge management technology activities could assist as the tools to simplify the knowledge management process: building databases, measuring intellectual capital, establishing corporate libraries, building intranets, sharing best practices, installing groupware, leading training programmes, leading cultural change, fostering collaboration, and creating virtual organisations. Transnet
as an organisation has a task to ensure that the available technologies are utilized wisely to achieve the goals of sharing knowledge through various knowledge management technologies. Technology itself is only there to enable business to achieve their organisational objectives. Each and every employee of an organisation has a task in a successful knowledge management environment to share knowledge through the various platforms available.

1.2 BACKGROUND TO THE STUDY

Recently, the Transnet board identified Enterprise Information Management System (EIMS) supported by Information Management Services (IMS) (formerly known as ICT Department) knowledge management technologies as one of the key drivers of the organisation’s business processes. Several studies were conducted within Transnet to find suitable KMTs. The purpose of the KMTs was mainly for knowledge and document management, by providing ready access to appropriate information, organising information and facilitating knowledge creation and sharing between employees and across the entire organisation. KMTs is defined as technological tools or applications enabling individuals, teams and entire organisations to collectively and systematically create, share and apply knowledge to better achieve the objectives derived from the strategy (Boughzala & Limayem, 2012). KMTs have the ability to assemble all information residing in different systems applications platforms including experiences that people possess (Boughzala & Limayem, 2012). The impact and use of the KMTs should also make it possible to interact with one another. This process will enable employees to extract the necessary information through KMTs to obtain the relevant knowledge on a regular basis.
Transnet SOC is a rail freight transportation organisation which interacts with many stakeholders both internally and externally. Transnet as an organisation has operating divisions geographically dispersed across the country, which means access to knowledge and information needs to be available to remote sites as well. Transnet SOC’s core business is moving volumes (rail transportation) through the following divisions: Transnet Freight Rail, Rail Engineering, National Ports Authority, Port Terminals and Pipelines; each taking part in the process.

The main reasons for KMTs to be implemented at Transnet were mainly for:

- Reutilisation of information or knowledge within the organisation
- Readily available knowledge or electronic knowledge management to assist in achieving organisational goals
- Knowledge sharing, individual learning and growth
- Retain knowledge in-house
- Enterprise content management
- Access to knowledge and expertise.

The KMTs in Transnet’s context were to transform functional areas of business into continuous learning areas. To achieve this, both technical and social skills are involved and comprise of, but are not limited to, the following:

- Knowledge management technologies - Technology
- Processes
- People, as key players in the process.
However, the researcher who is an employee at Transnet, is of the view that impact and use of the KMTs have not yet fully been felt, hence the need for this study.

1.3 RESEARCH PROBLEM

As already indicated in the introduction of this chapter, the research problem that was investigated in this study emanated from various initiatives within Transnet from different business areas or units. These initiatives use or require specialised skills and knowledge. However, the researcher noted the following research problem with concern that: knowledge creation, preservation, transfer and sharing are amongst key challenges that need to be addressed at Transnet. Also of note is that Transnet EIMS and IMS department is currently experiencing a number of challenges including, but not limited to, the following:

a) Minimal assessment/evaluation and investigation on the impact and evolving use of KMTs, which simply means that no benefits tracking for KMTs.

b) Lack of unified or common business processes between EIMS & IMS for the KMTs in the organisation.

c) Lack of knowledge sharing processes, collaboration and innovation.

d) Individuals leave the organisation with tacit knowledge simply because there are no clear methods or processes defined to convert tacit into explicit knowledge, therefore this leads to the EIMS & IMS department losing important knowledge because there is no defined knowledge retention process.
Should the above mentioned challenges not be addressed, different departments/units at Transnet will continue to work in silos which will lead to duplicates of KMTs, and more unnecessary costs.

1.4 AIM OF THE STUDY

The study seeks to explore the impact and evolving use of knowledge management technologies at Transnet in the Gauteng region. Basically, the study sought to explore different methods and processes that have been adopted by Transnet to convert tacit knowledge to explicit knowledge. In addition, the study sets out to explore methods of retaining tacit knowledge, knowledge sharing and collaboration, how organisational culture can influence knowledge creation, sharing and transfer at Transnet. The rationale behind this aim is to enable the study to come up with effective ways of converting tacit knowledge into explicit knowledge. Once all of the above has been done, this study will develop a conceptual framework that can be used to address the impact and evolving use of knowledge management technologies at Transnet.

1.5 OBJECTIVES OF THE STUDY

To achieve the stated aim, the study addresses the following objectives:

- To describe the impact and use of knowledge management technologies
- To discover the different methods for retaining tacit knowledge through converting tacit knowledge into explicit knowledge and close the process gaps.
- To discover an effective knowledge management system for capturing and retaining knowledge which will result in improved decision making and cost savings.
1.6 RESEARCH QUESTIONS

To achieve its aim, the study was driven by the following primary question: ‘To what extent is the impact and evolving use of KMTs within Transnet ensuring that the intended benefits are fully and effectively being realised?’

The complexity of the primary question required that the problem be divided so that it could be addressed through the following secondary questions:

a) How can Transnet effectively and efficiently use modern knowledge management technologies to improve its way of handling knowledge?

b) How does user involvement and business buy-in during the implementation of the KMTs affect its current state?

c) What is the extent of the current understanding of different types of knowledge management (Tacit & Explicit) at Transnet EIMS and IMS business units?

1.7 JUSTIFICATION OF THE STUDY

The researcher believes that Transnet could achieve shorter turn-around time to deliver and provide services to the market. Furthermore, this could improve accountability and responsibility, with the making of informed decisions and resolving of issues quicker, supported by access to integrated and transparent information across Transnet. Lastly, it will maximise efficiencies across Transnet by connecting silos of information across different levels of the organisation. Despite all these significant advancements in KMTs and substantial investment in technologies by
organisations, most are yet to find answers to such simple questions as how to capture, store and transfer knowledge and how to ensure that knowledge workers share their knowledge through the use of KMTs.

1.8 CONTRIBUTION OF THE STUDY

This study is expected to contribute both practically and theoretically.

1.8.1 Theoretical contribution
The study will theoretically add to the literature of knowledge management. The conceptual framework model will extend research in information systems, as the researcher used it in the assessment of the impact and evolving use of knowledge management technologies.

1.8.2 Practical contribution
It is important to note that for policy makers and business process optimization, the findings will help in the formulation of IT policies and business process definitions. The findings will further assist planners and implementers of the policies and business processes with regards to the aspects of relevance and contextual demand made on Market Demand Strategy (MDS).

1.9 DEFINITION OF TERMS

- **Knowledge management**

  In this study, this refers to the process of capturing, developing, sharing and effectively using organisational knowledge. It can also be defined as a multi-
disciplinary approach to achieving organisational objectives by making the best use of knowledge.

- **Evolving use**
  In this study, this can be defined as the process of growth and development and continuous adoption of technology to preserve knowledge.

- **Knowledge Management Technologies**
  In this study, this refers to Information and Communication Technologies that can be adopted to preserve knowledge.

- **State-owned-companies**
  A state-owned company is a legal entity that undertakes commercial activities on behalf of an owner, the government.

- **Knowledge creation**
  This is a process of generating new knowledge from tacit to explicit knowledge.

- **Knowledge transfer**
  This is a process of getting knowledge from an experienced to an inexperienced individual by sharing experiences; and in the process tacit knowledge is converted into explicit knowledge.

1.10 RESEARCH DISPOSITION

**Chapter One: Introduction and background to the study**
The first chapter, introductory chapter, gives an overview of the field of study. This is followed by the research problem background and the study goals and objectives. Then the significance and the rationale of the study are also highlighted, showing how the study may extend the understanding of KMTs and their evolving usage and the justification necessitating the research study.

**Chapter Two: Literature review**
This chapter focuses on the relevant literature, the concepts and theoretical foundation that informed the study.

**Chapter Three: Research methodology**
This chapter discusses the research methodology which gives the research design and methodology followed in order to investigate the problem as formulated in the first chapter.

**Chapter Four: Data analysis**
This chapter analyses and discusses the empirical evidence collected using the research methodology described in Chapter 3.

**Chapter 5: Summary, Conclusion and Recommendations**
This chapter gives the conclusion and recommendations based on the findings of the study.
1.11 SUMMARY

This chapter gave an overview of the field of study. This was followed by the research problem background and aims and objectives of the study. Then the justification and the contribution of the study were also highlighted, in brief.

The next chapter (Chapter 2) reviews different studies on the impact and evolving use of KMTs. The chapter further reviews literature on the methods or processes to convert tacit knowledge into explicit knowledge. Moreover, the chapter discusses the theoretical foundation that informed the study.
CHAPTER TWO

LITERATURE REVIEW

The previous chapter introduced the concept of the study and the research problem that is being addressed. This chapter reviews different studies on the impact and evolving use of knowledge management technologies. Furthermore, this chapter reviews the literature on the methods or process of converting tacit knowledge into explicit knowledge. It also discusses the theoretical foundation that informed the study. Lastly, a summary is drawn which presents key gaps in the literature.

2.1 INTRODUCTION

This chapter reviews different studies on the impact and evolving use of knowledge management technologies. The studies reviewed in this chapter were taken from journals, conference papers, research publications, official government publications and books. Bush and Harter (1980:70) are of the opinion that literature review is ‘an in-depth analyses, synthesis and assessment of information sources to advance insight and understanding of the problem under investigation.’

On the other hand, Neuman (2000:445) contends that literature review is ‘originated from the assumptions that knowledge accumulates and that we learn from and build on what others have done.’ In addition, Neuman (2000:447) points out that ‘integrative review presents the present state of knowledge and pulls together disparate research reports in a fast-growing area of knowledge.’ Similarly, Mugenda and Mugenda
(1999:29) are of the view that the review of literature ‘includes the systematic identification, location and analysis of documents comprising information related to the research problem being investigated.’ In this connection, this chapter is based on the objectives of the study as indicated below:

- To describe the impact and use of knowledge management technologies
- To discover the different methods for retaining tacit knowledge through converting tacit knowledge into explicit knowledge and close the process gaps.
- To discover an effective knowledge management system for capturing and retaining knowledge which will result in improved decision making and cost savings.

2.2 KNOWLEDGE MANAGEMENT DEFINED

It is important to note that many studies have been conducted to look at knowledge management in organisations. Similarly, many researchers have defined knowledge management and all of them concur that it refers to a ‘process of capturing, developing, distribution, and effectively using organisational knowledge’ (Champoux, 1999; Kirby, 2005; Nonaka, von Krogh, & Voelpel, 2006; Capozzi, 2007). Likewise, Ferguson (2005) describes knowledge management as ‘a multi-disciplinary approach to realising organisational objectives by making the best use of knowledge.’ In their study they conducted recently, Girard and Girard (2015) describe knowledge management as ‘the process of connecting people to people and people to information and to a competitive advantage.’ Addicot, Rachael, McGivern, Gerry, Ferlie, Ewan (2006) observe that a lot of big organisations, public institutions, and non-profit organisations have resources committed to internal knowledge management efforts.
This is continuously done as a part of their business strategy, information technology, or human resource management departments (Addicot, Rachael, McGivern, Gerry, Ferlie, Ewan, 2006). It is important to note that knowledge management efforts usually focus on organisational objectives such as improved performance, innovation, competitive advantage, the sharing of lessons learned, continuous improvement of the organisation, and integration (Gupta, Jatinder; Sharma, & Sushil, 2004; Maier, 2007).

KM as a field of study is the thoughtful and systematic coordination of an organisation’s people, technology, processes and organisational structure in order to add value through re-use and innovation (Capozzi, 2007). Many research authors have described KM as an enabler of organisational learning (Sanchez, 1996; Serenko, Alexander; Bontis, Nick; Booker, Lorne; Sadeddin, Khaled; Hardie, & Timothy, 2010). In support of these views, Dalkir (2013) is of the view that the systematic coordination is achieved through creating, sharing, and applying knowledge as well as through nourishing the valuable lessons learned and best practices into the organisation in order to foster continued organisational learning. It is worth mentioning that KM requires technologies to support the new strategies, processes, methods and techniques to better create, disseminate, share and apply the best knowledge - anytime and anyplace, across the team, across teams, across the organisation and across several organisations, especially its clients, customers, partners, suppliers and other key stakeholders (McInerney, 2002). However, Milosz and Milosz (2010) argue that as much as KM requires technology there has been technology failure to support it. On the other hand, Lindner and Wald (2011) also contend that the lack of critical success factors is unfortunately common for most organisations.
2.2.1 KNOWLEDGE MANAGEMENT CYCLE

McIntyre, Gauvin and Waruszynski (2008) note that knowledge processes in a KM environment are managed to convert knowledge for action and to attain the anticipated results of increased value in the organisation or specific operations. Furthermore, the latter authors designed a model management cycle to illustrate how knowledge is managed. They outline three general perspectives in the cycle, namely: management, application and people:

- **Management** focuses on capturing, organising and facilitating knowledge. Many of these activities span the externalization and combination quadrants of the Nonaka model.’

- **Application** focuses on effective repossession of relevant content through advanced searches and mining to conduct knowledge-related work and tasks and on the use of the results for discovery. It depend on the knowledge combination portion of the model.’

- **People** focus on learning, sharing and collaboration. This is the education component of the cycle that is within the internalisation quadrant, moving into the socialisation portion.’
Leonardi and Treem (2012) argue that knowledge management technologies (KMTs) are not simple containers for storage of knowledge, but that they are stages upon which individuals endorse performances of expertise. KMTs are often the primary site at which individuals present information about their behaviours to others, it would seem that there is adequate physical distance for the appearance of successful strategic self-presentations. Venters (2010) argues that KMTs are socially constructed in use based on the affordances and constraints of the technology artefact, since many KMTs are introduced with unclear purposes ‘such as to improve knowledge sharing’; it is therefore their affordances and constraints which strongly shape the socially constructed KMTs. Furthermore, Schmitt (2014) echoes the later views by stating that the fast-tracking development and widespread diffusion of KMTs has brought about
reflective changes in the way of working and living and caused significant organisational, commercial, social and legal innovations.

2.4 IMPACT OF KNOWLEDGE MANAGEMENT TECHNOLOGIES

The literature review further indicates that there is a strong relationship between technology and knowledge management, and between knowledge management and business performance (Hawajreh & Sharabati 2012). Safarzadeh, et al. (2011) shares the same sentiments by affirming that there is a significant relationship between information technology and knowledge management. However, the codification of knowledge in information systems, databases and knowledge repositories does not guarantee efficient KM (Rasula, et al., 2012). It only has a potential to influence in a positive way. According to Khalili, et al. (2012), technology supports knowledge management and this includes a variety of devices and connectivity that links them in order to enable all forms of electronic communications. The impact of KMTs is fostered by the creation of knowledge management environment to maximise the power of technologies.

The impact of KMTs can be achieved and assessed by the following principles (Khalili et al, 2012):

- Data gathering occurs once, accurately and at the original source.
- Information is available in a timely, useful and intuitive way to those with the need to know.
- Data is integrated and is gathered in anticipation of future needs.
Paghaleh, et al. (2011) further indicates that KMTs have two major abilities being:

- The ability to disclose knowledge
- The ability to create fast connections among knowledge channels.

The investment in KMTs has had a significant relationship with developing knowledge management (Kasim, 2010). However, Whelan and Teigland (2010) are of the view that KMTs have caused the explosion of information, because of the lower costs of multimedia technology, which simplified the process of access to information and helped to distribute information. The literature review states that in order to measure the impact of KMTs, there are three key elements of knowledge management (Rasula, et al., 2012). Those elements are united into three categories:

- **Information Technology** – the ability of technology to capture knowledge and the use of information systems.
- **Organisation** – people, organisational environment and processes.
- **Knowledge** - knowledge accumulation, utilisation, sharing practices and knowledge ownership identification.

Barnes (2011) states that technology is a reason why knowledge management is broadly discussed in recent knowledge management research. Knowledge management technologies have started with the creation of repositories, web pages and applications systems; and in many occasions the implementation of these technologies have failed. According to Sultan (2012), all types of organisations or businesses are living in an increasingly dynamic world which is generated by the
development or innovation in technology. Modern technologies offer a variety of new and extended possibilities such as codification to videos, transmissions across distances, and communication via video-conferencing. Social networking also has developed significantly which could help the organisation to keep in touch with customers and employees constantly. There are, however, many challenges especially around security issues - for example scams, and addiction to chats.

2.5 EVOLVING USE OF KNOWLEDGE MANAGEMENT TECHNOLOGIES

The literature review debates how the evolving use of KMTs empowers employees to engage in conversational and collaborative KM. It in turn enriches employees’ cognitive and creative processes. The study conducted by Sigala and Chalkiti (2015) confirmed that employees’ creativity is positively related to their participation in KMTs and the use of KMTs for searching, storing and reading information (internal cognitive processes) and sharing, discussing and co-creating information (external cognitive processes). According to Ou, et al. (2013) one of the most important human activities is communication. Furthermore, Ou, et al. (2013) show that the core value of information systems is the evolving use of technologies to facilitate communication. Analysing the review of literature, it becomes clear that organisations cannot ignore the presence of KMTs.

The evolving use or effect of the KMTs is to help people share knowledge through common storage so as to achieve economic re-use of knowledge and to help people locate each other and communicate through technology to achieve complex knowledge transfer (Khalili, et al., 2012). Furthermore, the use of KMTs within the
organisation has been identified recently by many organisations as an important tool for managing and sharing organisational knowledge in order to improve business performance and gain strategic competitive advantage.

The main use of KMTs in this study is to enable all the five stages of knowledge management lifecycle which are knowledge acquiring, creation, transfer, sharing and disseminate. The challenge about the evolving use of KMTs remains, as stated by Albers (2012), that knowledge might be spread throughout the organisation and not be available where it might best be put to use.

Holtgrewe (2012) states that technology has developed from a tool for information management to a tool for communication. This is through the use of virtual collaboration, which becomes ineffective in unstructured environments and without clear divisions of labour, and vice versa; the structures and tools need to be used through intelligent and careful labour (Schonauer, et al., 2013). The use of KMTs has their own challenges due to the influence of perceptions of the type, quantity and quality of knowledge they possess. This is because individuals can edit information in ways that are favourable and they can commit their time and effort to self-presentations without having to worry about extra cue leakage. Moreover, the common nature of knowledge management technologies affords individuals the opportunity to see what information others have contributed to a system, and choose to capture information that appears better, more complete or if desired, worse than what their colleagues have entered (Schonauer, et al., 2013).
The literature shows that there is an probability that users of knowledge management technologies do not always enter information that accurately represents their expertise, instead they may use the technology to capture information they know will help them to achieve the goal of being seen as an expert (Leonardi & Treem, 2012). The use of social media technologies and other standard forms of information and communication technology have enabled the public to share the knowledge, their views and perceptions through KMTs (Yates & Paquette, 2011). The evolving use of KMTs has provided the employees with the ability to respond quickly to changes in the information, the environment, provide flexibility, adaptability, usability and customisability (Yates & Paquette, 2011). These technologies allow knowledge sharing through creation of knowledge networks, though social networking may not be the main motivator for their use, (Leonardi & Treem, 2012).

It is important in this study to note that technology does not have a direct influence on knowledge. However, there is an indirect influence on knowledge through organisational elements, as an enabler of a better collaboration amongst employees in the organisation (Rasula, et al., 2012).

The EIMS and IMS departments are aware that they should develop better techniques to manage their greatest asset, which is knowledge. Currently they create and maintain knowledge in isolated systems targeted at specific departments, areas or workgroups, and forgetting that knowledge is virtually invisible outside the workgroup. Technology is not the solution to an organisation’s knowledge management needs, but it is clearly required to enable the organisation’s knowledge management processes. An attempt was made by one of the Transnet operation divisions, Transnet
Freight Rail (TFR) in 2014 to improve the current state of knowledge management within the organisation. The action plan was to ‘deliver the right knowledge to the right employee at the right time to improve organisational performance, efficiencies, safety and quality of services.’ However, this study focuses on the impact and use of KM technologies. Therefore, the results of the TFR cannot be generally used in this study.

The literature suggests that KMTs mainly strive to manage explicit knowledge and look for ways for creating, updating and utilizing new knowledge, through KM best practices (Johannessen & Olsen, 2010). This has resulted in knowledge workers relying on and exploiting the same old obsolete and insufficient knowledge which has no contribution to innovation. Knowledge workers are said to be employees who create intangible assets by using particular knowledge and who, due to the changing nature of the knowledge economy in which they operate, need to continuously enhance, upgrade and refresh their knowledge (Bussin & Toerien, 2015). The literature review reveals that there has been a decline in knowledge management popularity (Frost, 2014). Frost further states that this is attributed to the failure of knowledge management projects characterised in to two failure factors which are: causal and resultant. Causal factors refer to more common problems related to organisational and managerial issues required for the implementation of knowledge management, while resultant factors refer to specific problems such as lack of quality and usability, and loss of knowledge (Frost, 2014).

In this study, the researcher argues that Transnet as an organisation, like many others, has invested in knowledge management technologies in order to manage knowledge as a key competitive advantage. However, the studies carried out by Rusly, et al.,
(2011) established that even though many organisations are investing in knowledge management technologies, there has been an increase in the knowledge management failure. Furthermore the success is not always certain through technological infrastructure investment. It is further argued that the main achievements within knowledge management is employees’ willingness and commitment to participate in knowledge management initiatives.

2.6 TACIT KNOWLEDGE RETENTION

According to Kathiravelu, et al. (2014), knowledge is an important organisational asset that significantly impacts business operations. Knowledge can be classified as either explicit or tacit. Tacit knowledge is considered a knowledge that is in the individual’s mind, informed by their judgement and experiences (Nonaka, 1991). It is the most important form of knowledge as it is not or cannot be transferred and documented easily. It is considered to be the most valuable knowledge because it provides perspective to people’s thoughts and experiences (Bessick & Naicker, 2013). Dalkir (2013) further states that tacit knowledge has characteristics that distinguish it from other valuable commodities, i.e.

- The use of knowledge does not consume it (if knowledge is transferred the owner does not lose it).
- There is no shortage of knowledge; however, what is lacking is the ability to use it.
- The most valuable knowledge that organisations have is the tacit knowledge that is held by their employees.
Nelson and McCann (2010) state that one way to ensure knowledge retention is to retain the organisation’s knowledge workers. Martins and Meyer (2012), however, argue that it is important for organisations to identify which knowledge is valuable to be retained by the organisation because not all tacit knowledge can be retained within organisations. The other method that could be used for tacit knowledge retention between teams or team members is through socialisation (Stolz & Stayn, 2014). This study will refer to knowledge retention as the ability and action of organisations to keep knowledge within them, even when the individuals that held knowledge left those organisations.

The main discussion around the tacit and explicit knowledge types is whether tacit knowledge can be transferred or converted into explicit knowledge. The literature review suggests that the belief that tacit knowledge can be transferred is based on a misunderstanding of the nature of tacit knowledge (Powell & Ambrosini, 2012). For the purpose of this study, tacit knowledge is seen as being developed by individuals through practice. This may be particularly complex, and not sufficient time may have been invested to document this knowledge.

Roberts (2010) further argues that by distinguishing between explicit and tacit knowledge, an in-depth understanding of knowledge transfer is required, and in particular that of the role of Information and Communication Technology (ICT) in this process. Hence the research study’s secondary focus is on the conversion and retention of tacit knowledge to explicit knowledge within the organisation, using knowledge management technologies. Resources leave organisations or move across
business units/departments. Unfortunately, it is the organisation that suffers due to knowledge leaving whilst it should have been captured and managed through KMTs processes.

Jennings (2011), states that organisations are increasingly interested in information exchange as it relates to accumulating internal knowledge, increasing innovation and reducing costs. The main concerns augment the need for well-planned knowledge management technologies to ensure knowledge retention. The literature suggests that not all tacit knowledge can be converted to explicit knowledge (Jennings, 2011). For the purpose of this study, this notion is explored further. However, a challenge that business environments struggle with is to encourage employees to make their tacit knowledge available to others within the organisation.

2.7 TACIT KNOWLEDGE CONVERSION

The discussion on tacit knowledge was started a while ago by researchers using the SECI model. However, the discussion is still continuing with a brief review of why tacit knowledge is considered so important, despite being so misinterpreted (Tsoukas, 2011). According to Nonaka, et al. (2000), there are two types of knowledge, which are: explicit and tacit knowledge. Explicit knowledge can be presented in the form of a code, language and written reports using data, scientific formulas, and manuals; which means it can be communicated, processed, transmitted and stored relatively easily. Tacit knowledge refers to knowledge which is only known by an individual and is difficult to communicate to the rest of the organisation. Furthermore, tacit knowledge is personal knowledge embodied in actions, attitudes, commitments, emotions and
behaviour, and is difficult to codify sufficiently to communicate in a ‘language’ (Tsoukas, 2011).

Nonaka, et al. (2000) further state that tacit and explicit knowledge interchange is required for dynamic knowledge. The SECI model is used to depict the four stage spiral model. This involves: socialisation, externalisation, combination and internationalisation. This model begins with socialisation, where the exchange of tacit knowledge at the individual level is used without stipulating any particular language to create knowledge. This is followed by externalisation mode where tacit knowledge is transformed into explicit knowledge to create knowledge (this comprises written reports coming from lessons learned and impressions from experiences). The combination mode is where dynamic knowledge is gained by integrating isolated and existing pieces of explicit knowledge into a full system structure.

The theory of Nonaka, et al. (2000) states that SECI modes must be supported by two other elements which are ‘Ba’ and knowledge assets, to realise knowledge creation. Nonaka further states that knowledge creation and sharing cannot occur in a vacuum, instead it depends on the method of participation and the individuals who participate. The ‘Ba’ concept was introduced by the Japanese philosopher Kitaro Nishida and later redefined by Shimizu. ‘Ba’ refers to a specific time-space connection and conceptually unifies physical space, virtual space and mental space such as an office, e-mails and shared ideals (Nonaka, et al., 2000).

The interaction level (individual or group) and media type (face-to-face or virtual) result in four types of ‘Ba’ which are: originating, dialoguing, systemising and exercising
(Nonaka, et al., 2000). In the first stage, which is originating ‘Ba’, individuals share knowledge and feelings face-to-face. Dialoguing ‘Ba’ is helpful in promoting face-to-face interactions among group participants, while systemising ‘Ba’ offers a combination of explicit knowledge in virtual space through a group interaction. Lastly, exercising ‘Ba’ lays a foundation of four SECI modes for informal, simultaneous and dialectical dialogues among individuals and/or a group in physical and virtual space.

Figure 2.2: Integrated dynamic knowledge model

Adapted from Nonaka, et al. (2000)

There is a dependency on knowledge assets as it deeply relies on the strategic orientation of the organisation and the ‘Ba’ characteristics as they are intangible,
organisation-specific resources such as inputs or outputs of knowledge creation processes that contribute in yielding value. Nonaka states that the existing know-how skills, patents and technologies are in the group of already acquired knowledge assets. Nonaka, et al. (2000) divides knowledge assets into four types: experiential, conceptual, systemic and routine in order to understand how knowledge assets are created, attained, and exploited. Research studies carried out by Bratianu and Orzea (2010) and Bratianu (2012) critically analyse the SECI model by applying entropy laws to understand the conversion process, and then present characteristics of other models to compare with it. Furthermore, Andreeva and Ikhilchik (2011) presented a theoretical model to analyse the applicability of the SECI model in a Russian culture context. This was conducted to discuss the model and challenge the mainstream assumptions of universal applicability.

The discussions were further explored by Easa (2012) where he discusses the procedural aspects to examine the applicability of the SECI model in knowledge creation and its effect on innovation in Egyptian banks. The discussions led to a proposed knowledge transfer among development teams as a technique to identify improvement opportunities without considering SECI model (Frank & Echeveste, 2012). The previous literature review primarily targeted a knowledge transfer process as a part of a knowledge creation process. According to Verma, et al. (2014) leaders naturally possess a huge amount of experience in the form of tacit knowledge and are experts in their domain. However, programmes like apprenticeship where a strong desire to communicate and interact with others by engaging in day-to-day hands-on activities are another method to convert knowledge from one person to the other.
2.8 EFFECTIVE KNOWLEDGE SHARING PLATFORM – METHODS AND PROCESSES

According to Wu and Zhu (2012), there seems to be no single or uniform definition of knowledge sharing, as many researchers define knowledge sharing from their own perspective. Furthermore, it has been noted through literature review that some of the researchers use knowledge sharing, retention and flows interchangeably. Knowledge sharing is referred to as an action where employees impart and exchange their knowledge and skills with each other (Zhu, 2012). Literature review has shown that for organisations to be effective in transferring and sharing knowledge, there is a need to decisively and proactively adopt knowledge management practices (Meier, 2011).

In order for knowledge management capturing and retention to be effective, the following knowledge management initiatives across the organisation need to be in place (Meier, 2011):

- Knowledge Portal
- Knowledge Workspaces
- Urgent Requests
- Document Libraries
- Knowledge Server and Services.

According to Christopher and Tanwar (2012), organisational processes play a key role in the effectiveness of knowledge sharing. Through the literature it has been stated that lack of KM policy, documented processes for knowledge sharing, resources for
managing knowledge, consistency in KM and measurement of knowledge re-use could result in the unsuccessful knowledge sharing (Christopher & Tanwar, 2012). Perhaps these maybe as a result of independent knowledge databases, lack of knowledge sharing culture and no returns or rewards. Jennings (2011) states that organisations are increasingly interested in information exchange as it relates to accumulating internal knowledge, increasing innovation and reducing costs. The main concerns augment the need for well-planned knowledge management technologies to ensure knowledge retention.

According to Denicolai, et al. (2014), effectiveness of knowledge sharing practices for faster and improved work processes has gained visibility through globalisation, outsourcing, new technologies, new partnerships and government regulations. However, this process is hindered by the lack of a common framework or general strategy that can be adapted by different organisations (Dalkir, 2013). Yao, et al. (2013) suggest that the main problem is the lack of a universal framework or strategy.

Nonaka, et al. (2013) supported by Xu and Wang (2014), state that the knowledge management technologies are increasingly part of the main focus on organisations which are intended to promote the sharing of knowledge with the aim of successfully creating innovation. Meihami and Meihami (2014) share the same sentiments by stating that sharing and managing knowledge through technologies is essentially a strategy to gain competitive advantage for organisations.

Tikkanen (2010) states that age and gender differences hinder knowledge sharing and building significantly. This implies that employees of the opposite gender cannot mix
freely in the organisation and share knowledge on a free platform. Tikkanen further states that similarly, employees within a wide age gap cannot discuss certain aspects of knowledge building. This is because of the perceived respect that the new and younger employees give to the elders. Sharma and Singh (2012) have shared and concurred with several researchers on the fact that organisations’ management lacks adequate time to share knowledge and even identify the respective employees in need of the specific knowledge.

Yusof, et al. (2012) argues that the current studies on knowledge sharing models have been found to be lacking the solutions or models to knowledge sharing. The focus seems to be only on the relationship between factors that influence knowledge sharing, instead of a holistic knowledge sharing model that is based on an integrated approach. There is a need to develop a model that combines factors that influence knowledge management (input), knowledge sharing quality (process) and workers performance as well as service delivery (output) that encompasses the individual, organisation and technology.

2.9 EFFECTIVE AND EFFICIENT KMTS RESULT IN ENHANCED SERVICE DELIVERY

This research study contributes to the knowledge management field through understanding the interrelation and the role of KMTs in achieving better business performance. The implication in organisations is that most of the business units focus excessively on the growth of new knowledge that is possibly useful for their own businesses. There is relatively fewer attempts at the corporate level to undertake
pioneering innovations by integrating the diverse knowledge possessed by individual units.

Filippov and Lastrebov (2010) state that the effective and efficient KMTs have increased access to information and increased the ability to produce information. Almost all reviewed literatures indicate that there is a strong relationship between information technology and knowledge management; and between knowledge management and business performance or service delivery. Wiig (2011) echoes that by stating that for better performance, employees must be provided with resources and opportunities to do their best through knowledge and understanding as well as motivation and supportive attitudes. The existence of different business units in organisations tends to create motivation for managers to focus only on their own business unit’s interests and promote an organisational culture that emphasises the autonomy and independence of individual units (Lee, et al., 2010). Failure to implement knowledge management technologies is often blamed on the employee and an organisation’s culture of not willing to adopt to change. Lee, et al. (2010) argue that people are unwilling to share their ideas or take the time to document their insights because they need to secure knowledge as it is the only thing that keeps their jobs safe. Major transformation in organisational culture is needed in order to create a desire to share and develop methods that ensure knowledge databases are kept up to date and make sure that they are relevant to the people who need to retrieve the data and also shows commitment/will in organisational culture transformation at all levels of an organisation in order for it to succeed.
The argument in this research study is that the key to understanding the process of creating knowledge is opposition thinking and acting, which exceeds and synthesises such contradictions. The fact here is that synthesis is not compromised but rather it is the integration of differing aspects through a dynamic process of discussion and practice. Also to be taken into consideration is the fact that knowledge creation is a transcending process through which entities (i.e. individuals, groups, and organisations) surpass the edge of the old into a new self by obtaining new knowledge. Knowledge cannot be created in a vacuum but needs a place where information is given meaning through interpretation.

Through the guidance of an activity theory, there is hope to explain the dynamic process of knowledge creation and use. This study will unpack the argument that knowledge creation is a synthesising process through which an organisation interacts with the individuals and the environment to exceed emerging inconsistencies that the organisation faces. Knowledge creation starts with socialisation which is the process of converting new tacit knowledge through shared experiences in day-to-day social interaction. This process allows an individual to embrace contradictions rather than confront them. It will allow actors to absorb knowledge in their social environment through action and perception.

2.10 THEORETICAL FRAMEWORK

The main purpose for this section of Chapter 2 is to provide a background to the theoretical framework that is being used in this research. Only one theoretical framework was used in this study, which is the Activity Theory. Activity theory was used during the empirical data collection and analyses. The concepts, background
and relevance of Activity Theory to this research are discussed. The theory is used as a lens to provide meaning to interpret actions of people’s interaction towards a particular outcome guided by a set objective. Moreover, the conceptual framework developed in this research is also being addressed.

2.10.1 Activity Theory overview

Activity theory is a great socio-cultural and socio-historical lens through which most forms of human activity can be analysed (Jonassen & Ronrer-Murphy, 1999). Furthermore, Blin and Murno (2007) state that activity theory (cultural-historical theory of activity) as a framework is mostly used to design a technology-rich learning environment. The aim with the use of activity theory is to improve evaluation practices of learning technologies, and to understand the variability in adoption patterns when it comes to the activities and purposes for which ICT is being used. The activity theory core concept is that individuals at work engaging with their environment will result in production of tools that are ‘exteriorised’ forms of mental processes. These will result in them being pervasive, communicable to broader audiences and available to social collaboration. The theory is applied to a specific environment with social interaction for an activity. In its nature, the activity theory is not a predictive theory but a conceptual one (Kaptelinin, 2006).

The relationship between a human agent and objects in the environment is facilitated by cultural means, tools and signs. This theory assists by looking at experiences of other researchers who have tried to solve similar problems at an earlier time and created or modified these tools to make them more efficient. The focus is on interaction
of human activity and consciousness within its relevant environmental context. These human activities lead to actions which are developed through operations concerned with conditions.

2.10.2 The principles of Activity Theory

Activity theory has basic principles comprised of hierarchical structure of activity, object-orientedness, internalization/externalization, tool mediation, and development (Cassens & Kodfod-detersen, 2006). The basic principles of activity theory are further defined below:

- Hierarchical structure of activity: Differentiation between the levels of process operation with significance to the intended objects.
- Object orientedness: Environmental properties (social and cultural practices) co-exist with other properties of objects (physical properties). The principle of ‘object-orientedness’ (not to be confused with object-oriented programming language) states that human beings live in a reality that is objective in a broad sense: the things that constitute this reality have not only the properties that are considered objective according to natural sciences but socially/culturally defined properties as well.
- Internalisation/externalisation: Distinction between internal and external activities: Using the imagination (example) to simulate an activity and carrying it out in the real world. Activity theory differentiates between internal and external activities. Internalisation provides a means for people to try potential interactions with reality without performing actual manipulation with real
objects. Whereas externalisation is often necessary when an internalised action needs to be ‘repaired’, or scaled. It is also important when collaboration between several people requires their activities to be performed externally in order to be co-ordinated.

- **Mediation:** Tools mediate activity. Differences in the types of tools exist due to socio-cultural differences. Activity theory emphasises that human activity is mediated by tools in a broad sense. Tools are created and transformed during the development of the activity itself and carry with them a particular culture-historical remains from their development. So, the use of tools is an accumulation and transmission of social knowledge.

- **Development:** Understanding the change of a complex system to its current form. The basic research method in activity theory is not traditional laboratory experiments but the formative experiment which combines active participation with monitoring of the developmental changes of the study participants.

- **Unity of consciousness and activity:** The human self-image and interactions with the environment are to be treated as one.

2.10.3 Why Activity Theory

The activity theory is more of a descriptive framework than a predictive theory as it considers the whole work or an activity system, such as teams or organisations beyond just one user. Considering the technologies used for knowledge management, the activity theory is key for this research study as it assists in the identification of the processes involved on the impact and evolving use of knowledge management.
technologies, innovation, knowledge creation, transfer sharing and collaboration. The second factor why this theory is considered is because of the unit of analysis. It is motivated activity directed at an object or goal and also, it includes cultural and technical mediation of human activity and artefacts in use. The activities consist of goal-directed actions that are conscious and constituents of activities which are not fixed and they can change dynamically.

This theory will give the researcher an opportunity and time to study what influences the behaviour and motivation of the subjects. Activity theory will assist in enabling the description of a near natural occurrence of activities and provides a framework to translate activities and operations. The decision in choosing activity theory was appropriate in this research as it helped to focus the research on various subjects such as impact and evolving use of KMTs, collaboration, participants of EIMS & IMS in their involvement within the activity and the various roles they played. The participation in other instances was recognised as they acted as community members and participants in the division of labour in contributing to the objective of assessing the impact and use of KMTs.

2.10.4 Basic Structure of Activity Theory

According to Kuutti (1995), the activity theory was first born within soviet psychology but today there is an developing multi-disciplinary and international community of scientific thought united by the central category of activity, a community reaching far beyond the original background of the theory. The activity theory is a logical and cross-disciplinary framework for studying different forms of human practice as development
processes, both individual and social levels interlinked at the same time. Figure 3 presents a basic structure of an activity theory and also represents a systemic model of an activity. The structure is a fulfilment of systemic relations between an individual and the environment for an activity. The major component, namely community, (those who share the same object) has to be the pillar for both the individual and environment.

**Figure 2.3: A basic structure of an activity**

![Diagram of an activity structure]

*Adapted from Engestrom (1987)*

Figure 3 draws attention to three joint relationships involved in every activity:

- The relationship between the subject and the object of the activity, which is mediated by tools that both enable and constrain the subject’s action.
- The relationship between the subject and the community which is mediated by rules.
- The relationship between object and community which is mediated by the division of labour.
The first activity tool is anything that is used in the transformation process, including both the material tools and tools for thinking, i.e. wired and wireless devices, languages and texts. Nardi (1996) further concurs with the later views that the use of culture-specific tools shapes the way people act and think. Tools may consist of the design models and methods, the software production tools, project management system or any other kind of tools that instructional designers use to transform the object. The second activity, *Rules*, cover both explicit and implicit norms, practices, conventions, structures and social relations within a learning community. The third activity, *Division of labour*, represents the implicit and explicit organisation of a community as related to the transformation process of the object into the outcome.

2.10.5 Activity Theory, activity system components

Robertson (2008) explains the activity system components of the activity theory as shown below:

**Table 2.1: Activity Theory**

<table>
<thead>
<tr>
<th>Activity</th>
<th>What sort of activity will be undertaken?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object</td>
<td>Why is the activity taking place?</td>
</tr>
<tr>
<td>Subject</td>
<td>Who is involved in carrying out the activity?</td>
</tr>
<tr>
<td>Tools</td>
<td>By what means are the subjects performing the activity?</td>
</tr>
<tr>
<td>Rules and regulations</td>
<td>Are there any cultural norms, rules or regulations governing the performance of the activity?</td>
</tr>
<tr>
<td>Division of labour</td>
<td>Who is responsible for what when carrying out the activity and how are those roles organised?</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Community</td>
<td>What is the environment in which this activity is being carried out?</td>
</tr>
<tr>
<td>Outcomes</td>
<td>What is the desired outcome from carrying out this activity?</td>
</tr>
</tbody>
</table>

### 2.11 SUMMARY

This chapter reviewed different studies on knowledge management and how Information and Communication Technologies can be adopted in the knowledge management process. In addition, this chapter discussed the theory on which the study is based. This chapter discussed the activity theory as the theory underpinning this study. Also discussed was the overview of the activity theory, basic principles, and structure components, properties, why the theory was chosen and conceptual framework. The literature review has revealed that there is huge investment in knowledge management technologies. However, there seems to be too much reliance on technology to resolve knowledge management issues. This has led into inefficient KMTs. This necessitates or raises questions on whether there is willingness and commitment from both employees and management.

The next chapter (Chapter 3) presents the research methodology that was used to conduct the study.
CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter presents the research methodology that was adopted to conduct the study. There are many researchers who have defined research methodology and all of them concur that it is ‘a research plan of action to measure variables of interest’ (Neuman (2000:190; Babbie, 2010). On the other hand, Bailey (1987:33) is of the view that ‘the research design and methodology is the philosophy of a research process.’ The latter author adds that research design and methodology include firstly, ‘the assumptions and values that serve as the rationale of a study and, secondly, the standards the study uses for interpreting data and reading the conclusions.’ According to the latter authors, it is safe to say a ‘research method is understood as a first in the way and the means by which a research project is implemented.’

Put rather simply, the authors above concur that ‘a research design, therefore, is the structure of research that describes what to do, and how to do it.’ In his understanding, Kothari (1985:1) defines it as ‘a voyage of discovery that entails following a well-laid plan to steer correctly on course.’ In support of the views, Durrheim (1999:29) describes it as a ‘strategic framework for action that serves as a bridge between research questions and the execution or implementation of the research.’

3.2 RESEARCH DESIGN
This section discusses the research paradigm, and the approach.

3.2.1 Paradigm

The research paradigm adopted in this study is the interpretive approach. According to Myers (2010), all research methodologies, whether quantitative or qualitative research, are based on some fundamental assumptions about what constitutes a valid research and which research methods are appropriate. Interpretive researchers normally start out with the assumption that access to truth is only through social constructions such as language, consciousness and shared meanings. Byrne (2007) suggests that the main aim of an interpretive research is to understand, rather than to predict. Therefore, reality is socially constructed, understanding phenomena through meanings given and there is a need to understand the context and process. Byrne (2007) also notes that the researcher relates with human subjects, thereby changing the insights of both parties.

Interpretive approach contains qualitative methodological approaches such as phenomenology, ethnography and hermeneutics. It is categorised by a belief in a socially constructed, subjectively-based reality influenced by culture and history. This approach is ideal for researcher objectivity, passive collector and expert interpreter of data. The main reason justifying the use of interpretive research is because the research focuses on the profounder meaning of knowledge activities (operational activities, organisational culture and adoption challenges) of knowledge management technologies, impact and evolving use. This meaning is derived from the participants’ responses and the contexts in which they work.
3.2.2 Approach

The study adopted a qualitative case study approach. Therefore, this is an exploratory case study. There are a number of factors that can influence a researcher to use a qualitative or quantitative method. This research study is based on a qualitative method. The aim is to investigate the impact and evolving use of KMTs at Transnet’s EIMS and IMS business units. Furthermore, the study investigates the process of converting tacit knowledge into explicit knowledge. This approach will focus on the need for valuable data that can facilitate the generation of theoretical frameworks which cannot be derived satisfactorily from existing data. The study focuses on getting perspectives of participants so that data gathered, and the subsequent meaning attached, is understood within the study.

A qualitative research methodology is a method whereby the researcher determines what aspects or factors exist, rather than how many there are (Babbie, 2005). There is much description involved in a qualitative research as it is less structured and more responsive to the needs and nature of the research situation. Qualitative research involves an in-depth understanding of human behaviour and the forces that govern it (Babbie, 2005). It relies on reasons that cause certain behaviour by investigating the why and how of decision making (Babbie, 2005). Denzin and Lincoln (2011), further add to the views above by stating that qualitative researchers study things in their natural settings, trying to make sense of, or interpret, phenomena in terms of the meanings people bring to them.
As indicated above, this is a case study and it is mostly used in information systems as a review that investigates a phenomenon within its real life (Myers, 2010). The focus is on one instance of the aspect that is to be investigated. Aspects such as a particular individual, programme, event in an organisation, a department or an information system are studied in detail for a set period of time. The instance can be studied in-depth over a period of time, using interviews, observations, document analysis or questionnaires as data generation methods. The main objective is to obtain a valuable and thorough insight about the studied case (Oates, 2008). It may be particularly suitable for learning more about a little known or poorly understood problem and can also be useful for investigating how an individual or programme changes over time, perhaps as the result of certain circumstances or interventions (Leedy & Ormrod, 2002).

3.3 TARGET POPULATION

The target population were Transnet EIMS (Formally known as ICT) and IMS, as mentioned in the problem statement. This was based on the following categories of employees:

- Graduate in Training (GIT’s) – which are new recruits to the organisation seeking experience, finding it hard because of knowledge sharing platforms not being sufficient enough.

- Managers – who should lead by example and create an environment that encourages knowledge creation, transferring and sharing.

- Specialists – experts in their area of specialization.
• Other (Technology users) – these range from consultants to the organisation’s technology users.

3.4 SAMPLING TECHNIQUES AND SAMPLE SIZE

A purposive sampling was used to select seventeen (17) participants as indicated below:

• Graduates: 5
• Managers: 2
• Specialists: 5
• Technology users: 5

3.5 DATA COLLECTION INSTRUMENT

This section discusses the data collection instrument that was used in this study. The main aim for this was to gather data to better understand the research problem and the context in which it was established. Data was collected using face-to-face interviews. All participants who took part in the interviews were identified and selected based on their willingness and availability to answer questions while doing their daily activities/tasks. Interviews use the same principles as a focus group, but subjects are interviewed individually, ideally in the participant’s own home (Babbie et al., 2001). These interviews were meant to allow participants to share their experiences on the impact and use of knowledge management technologies usage, their understanding on KM, the effectiveness of KM processes and challenges faced, i.e. adoption and operational activities of these technologies. The interviews lasted about an hour.
These interviews took place in the working environment with participants involved in an authentic task and were conducted in English as all the participants could understand it. This was mainly done so that their responses could be understood in the context of what they do and the environment they interact with. The researcher took notes to record the interviews.

3.6 DATA ANALYSIS

The data was analysed using axial and open coding, where dominant themes from the discussions were identified and discussed in detail (Strauss & Corbin, 1998). Data analysis was divided into two phases. In the first phase, the researcher engaged in ‘open coding’ in order to generate thematic categories, thereby reducing large passages of text to principal concepts. In the second phase, the researcher engaged in ‘axial coding’ in which he forms concrete codes for analysis. Basically, the study aimed at generating a rich body of findings from a smaller number of participants, rather than less detailed information from a larger group.

3.7 PILOT STUDY

A pilot study was undertaken prior to the main study and it was conducted at Transnet in the Gauteng region. The main purpose of the pilot study was to set and refine the research instrument. To this end, an interview guide was pre-tested before the main study. The pilot study aimed to test the subject matter of the current research, the population it would cover, its spatial variability, and participants’ possible reactions to questions. The findings from the pilot study were positive because all five (5)
participants understood what the study wanted to establish and they were happy with the questions asked. It is important to note that all the participants in the pilot study were not included in the main study.

3.8 RELIABILITY AND VALIDITY OF THE STUDY

3.8.1 Reliability
Yin (2009) indicates that reliability means that if a researcher may conduct the same study following the same process and procedures followed by the first researcher, then the findings of the second researcher should produce the same results and conclusions.

3.8.2 Validity of constructs
Validity in research refers to a test of truthfulness that checks if the research measuring instruments is actually measuring what it is supposed to measure (Yin, 2009). The following tests are conducted to ensure validity for this study:

- **Face validity**
  
  Face validity should be conducted to ensure that the measuring instrument conforms to the common agreement. To ensure face validity, the measuring instrument was checked for syntax and semantics of each question item so as to verify and validate its meaning to the respondents (Yin, 2009).

- **Content validity**
  
  Content validity is carried out to ensure that the measuring instrument is designed to cover the range and meaning of the research at hand (Yin, 2009). This was achieved
by measuring some items that had already been tested and validated by previous researchers.

3.9 ETHICAL CONSIDERATIONS

The research ethics in this study have been established to eliminate any potential abuse or harm to participants. Bryman and Bell (2003) have defined ethics as standards of behaviour that the community of researchers has accepted and is well embedded in their daily lives and forms part of the norm. Babbie (2005) has echoed that by stating that the highest ethical standard to follow is not to bring about any suffering to research participants even though they have given go-ahead to participate in the study. This means that no cohesion, intimidation or bribery tactics are to be used to invite participants to be involved in the research study.

Therefore, this study adopted the following steps as outlined by Cooper and Schindler (2008) during interviews and observations:

- Interviews were conducted with participants after receiving their verbal consent.
- Purpose and objectives of the study were communicated without any additions.
- Anonymity was guaranteed and maintained by making sure that participants’ names were not revealed in the reports or to other individuals.
- Information collected during the research period has been kept confidential.
3.10 SUMMARY

This chapter gave a brief overview of how empirical research was conducted by emphasising the philosophical approaches and the method followed to collect evidence. The study was done in an authentic work environment. The data was collected using face-to-face interviews.

The next chapter (Chapter 4) presents the analysis of the empirical evidence collected using methods defined in this chapter.
CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF FINDINGS

This chapter presents the findings from the field. Data was collected through face-to-face interviews. Thematic categorization was used to analyse data. The analysis is grouped according to the following themes:

- Investigate the impact and evolving use of KMTs at Transnet
- Explore the different methods to convert and/or transfer tacit knowledge into explicit knowledge
- Determine effective knowledge sharing platforms with the organisation’s well defined processes
- Enable the organisation processes to be effective and efficient KMTs resulting in enhanced response to service delivery.

4.1 INTRODUCTION

This chapter provides an overview of the nature and appropriate uses of qualitative methods and key considerations in conducting qualitative research. The main purpose for qualitative research is to understand issues or particular situations by investigating the perspective and behaviour of the people in these situations and the context within which they act. The approach is useful in understanding casual processes and facilitating action based on the results. According to Kaplan and Maxwell (2005) to achieve this, qualitative research is conducted in natural settings and uses data in the form of words rather than numbers.
The analysis of the empirical evidence is organised into four objectives depicted in Figure 4 below:

**Figure 4: Research themes**

- **Research Goal**
  To conceptualise a framework to address the impact and evolving use on KMTs at Transnet EIMS and IMS business units.

- **Objective I**
  Investigate the impact and evolving use of KMTs at Transnet

- **Objective II**
  Explore the different methods to convert and/or transfer tacit knowledge into explicit knowledge & close the process gaps

- **Objective III**
  Determine an effective knowledge sharing platform with the Transnet well defined processes for capturing and retain knowledge which will result in improved decision making and cost savings

- **Objective IV**
  Enable the Transnet processes to be effective and efficient resulting in enhanced response to service delivery

**SECTION A**

4.2 DEMOGRAPHIC PROFILE OF PARTICIPANTS

The participants’ demographics and experiences were investigated as the measuring instrument. In research studies, demographics are very important to describe the importance of socio-demographics and the situational variables of participants. Demographics include participants’ positions, gender, age group and level of education. The demographic findings indicate that there were more females than the males. The participants’ gender information was taken into consideration to avoid bias, avoid focusing on one gender and to allow possible generalization of the findings.
According to the studies by Venkatesh, et al. (2003) and Kalema (2013), gender could have a significant influence on the use of technologies. Furthermore, many of these participants were between the age group twenty-six to thirty-five. The study by Mansor and Abidin (2010) indicates that the younger employees are more likely to use technologies than their older fellow colleagues within an organisation.

The findings further indicate that more participants had higher educational level of up to a tertiary degree. The level of education is referred to as business expertise and training. Researchers such as Mansor and Abidin (2010) and Kalema (2013) argue that the level of education is a key interacting factor in the technological innovation usage.

SECTION B

4.3 IMPACT AND EVOLVING USE OF KMTS

One of the objectives of the study was to explore the impact and evolving use of knowledge management technologies at Transnet. The main aim behind this objective was to describe the value of Information and Communication Technologies that have been adopted by Transnet to manage knowledge. Also of note is that the study wanted to find out whether the management of knowledge at Transnet had any value in as far as improving work productivity and creativity is concerned. Therefore, participants were asked to express their opinions on whether KMTs had any influence on the operations of the organisation and their daily work activities. One of the participants shared the following:
‘The impact is felt in a sense that we can use KMTs to share and store information, and also improve communication within the organisation.’

Based on the findings above, it is safe to say that KMTs are playing a significant role when it comes to facilitating sharing and storing of information. In addition, the findings depict that KMTs have improved communication at Transnet. In support of the findings above, Sigala and Chalkiti (2015) observe that employees’ creativity is positively related to their participation in KMTs and the use of KMTs for searching, storing and reading information, and sharing, discussing and co-creating information. Likewise, Ou, et al. (2013) are of the view that one of the most important human activities is communication. In addition, Ou, et al. (2013) argue that the core value of information systems is the evolving use of technologies to facilitate communication. Khalili, et al. (2012) shares similar sentiments by noting that the evolving use or effect of the KMTs is to help people share knowledge through common storage so as to achieve economic re-use of knowledge and to help people locate each other and communicate through technology to achieve complex knowledge transfer. Interpreted in light of the action theory on which this study is based, at work individuals engage with their environments which normally results in production of tools that are 'exteriorized' forms of mental processes. These will result in them being pervasive, communicable to wider audiences and available to social collaboration (Blin & Murno, 2007).

Contrary to the finding above that the impact of KMTs is felt in a sense that workers can use these technologies to share and store information, and also improve communication within the organisation, it emerged during the interviews that not all
participants were enjoying the benefits of these technologies. This was expressed by one of the participants who noted the following:

‘To be perfectly honest with you, for me there is very minimal impact because of limited information and awareness on KMTs that the organisation has put in place.’

There is no denying the fact that in a working environment, for employees to adopt technology they need to be made aware of that particular technology so that they fully embrace it. It is worth noting that KMTs are crucial in shaping up how organisations enhance their work productivity and creativity. Mbatha (2015) observes that ICTs are playing a significant role in enhancing work productivity and creativity in an organisation. However, he cautions that the latter is only possible if workers in the organisation are fully aware of the benefits of adopting the technology. In line with these views and the findings above, Sharma and Singh (2012) are of the opinion that partly the problem is that some organisations’ management lack adequate time to share knowledge and even identify the respective employees in need of the specific knowledge. The latter authors also concur that lack of awareness of KMTs is a serious threat to the full adoption of these tools. On a positive note, the study found that some of the participants were of the view that KMTs had a positive impact and were playing a significant role in as far as improving work efficiency at Transnet was concerned. To this end, one of the participants shared the following:

‘I have heard some of my colleagues complaining that they do not know the value of KMTs in the organisation. I must say that I hold a different view in this case, for me KMTs do have a strong and visible impact on the way we do our work in this organisation. These technologies have beyond any doubt improved
efficiency in the way we do our work and have enabled the organisation to share knowledge and preserve it for future reference.’

Clearly the findings above suggest that KMTs have a strong impact in the operations of the organisation. Also, the findings show that KMTs are playing a significant role in improving work productivity and creativity at Transnet. Moreover, the findings show that KMTs have a strong impact when it comes to increasing access to information and increasing methods of preserving knowledge. In concurrence with the findings above, Filippov and Lastrebov (2010) are of the opinion that the effective and efficient KMTs have increased access to information and increased the ability to produce information. In his study, Mbatha (2015) opines that KMTs play a significant role in supporting knowledge workers in the organisation at an operation level (Mbatha, 2015). Likewise, Mbatha (2013) notes that KMTs are used to enable technology to provide employees with the knowledge they need to perform a specific task as efficiently as possible.

Researchers such as Davenport (2013), Mbatha (2013) and Drucker (2013) have written extensively on knowledge management and have concurred that making knowledge available to the right people at the right time is crucial for building and sustaining an organisation’s competencies. The latter authors further observe that the key ingredient in maintaining a competitive advantage in the current dynamic and demanding marketplace is through continuous innovation. According to Tyagi, et al. (2015), continuous improvement requires an organisation to regularly update and create knowledge for the current generation, and re-use it later for the next generation of a product.
On the other hand, Dalkir (2011) indicates that effective knowledge management requires an organisation to identify, generate, diffuse, and capture the benefits of knowledge that provides a strategic advantage to that organisation. However, Shokrzadeh, et al. (2012) argues that for this process to be realised and to be efficient it requires specific roles of knowledge development and management. The latter author believes that the process will play a huge role in creating new knowledge as well as the application, transforming and integration of existing knowledge. In line with these views, the study found that some of the participants were of the view that KMTs are important at Transnet such that their non-existence might affect the operations in the organisation; which may result in a lack of work productivity and creativity. One of the participants shared the following:

‘Assume there were no KMTs at Transnet; this was going to have a negative impact on the way we do our job and share knowledge. The existence and adoption of KMTs makes information available to share with one another within the organisation, and in the process the knowledge is managed for future reference.’

Although not all the participants shared similar views, it is a good thing to know that some of the participants were of the opinion that without KMTs the organisation may not be able to perform to its capacity. This is simply because KMTs have proved to be catalysts when it comes to sharing and preserving knowledge in the organisation. Many researchers and KM enthusiasts have written extensively on knowledge management in organisations. These researchers and KM enthusiasts concur that it is important to manage knowledge in the organisation because that is how the
knowledge is captured, developed, and shared for the betterment of the organisation and society (Champoux, 1999; Mbatha, 2012; Kirby, 2005; Nonaka, von Krogh, & Voelpel, 2006; Capozzi, 2007). In strengthening the aforementioned views, Ferguson (2005) opines that knowledge management is playing a significant role in enhancing the way the organisation shares and preserves knowledge and it assists the organisation to achieve its organisational objectives. Also in support of the views expressed above, Girard and Girard (2015) observe that knowledge management is crucial in 'connecting people to people and people to information and to a competitive advantage.'

SECTION B

4.4 STATUS OF KMTS IN THE STATE-OWNED COMPANIES

The participants were asked to comment on the current status of KMTs at Transnet as one of the state-owned companies in the country. This was to ascertain whether the participants were aware of what was happening in other organisations in as far as the adoption of KMTs was concerned. This discussion was important to measure the level of adoption of these technologies so that lessons can be learned from one another, and experiences shared. The study found that participants had different views on this issue. Some of the participants were of the view that some state-owned companies had already adopted these technologies and were at an advanced stage of usage. This was shared by one of the participants:

‘I can tell you that we are in an advanced stage because the organisation ensured that everyone in the organisation is aware of these KMTs and knows
how to make use of them. The good thing is that we also have latest technologies, and monitoring systems are in place.’

Based on the findings above, it is safe to say some of the participants had positive comments to say on the matter which is a good thing given the fact that organisations are spending a lot of money and resources to make sure that knowledge is managed for future reference and for the betterment of the organisation. Also of note is that it is good to know that Transnet has adopted latest technologies to manage knowledge. This is in line with the study conducted by Mbatha and Ocholla (2011) where they wanted to establish the ICTs level of adoption in selected government departments in South Africa. One of the interesting results of their study was that for organisations to remain relevant they need to adopt latest technology in the market. They added that organisations need to update their technologies in order to realise their objectives. It is worth mentioning that relevant and latest technology also has the power to enable organisations to improve their work productivity and creativity (Kling, 2000; Mbatha, Ocholla & Re Loux, 2011).

Contrary to the findings above, and interestingly so, not all participants were holding similar views on the status of KMTs at Transnet and in other state-owned companies. It emerged during the interviews that many participants could not comment on the KMTs status of other state-owned companies because they had no idea of what was happening in these companies. However, these participants could only comment on KMTs status of Transnet where they were employed. Some of the participants revealed the following:
‘Eish my brother, you see, some of us are not using technologies to their fullest capabilities. Tools are in place but the impact is not yet felt.’

It is interesting to note that at Transnet there were some participants who were not using KMTs to improve the way they were doing their work. As mentioned in the findings above, these tools have been put in place but they were not being used by some of the employees. In their study on ICT adoption by South African government departments, Mbatha, Ocholla & Le Roux (2011) established that globally civil servants, including from state-owned-companies, are using technology to improve their business activities, and that is how the e-government term was coined. As a result, for government employees to be able to efficiently and speedily perform their duties, they should be given complete access to relevant technologies.

4.5 CONTRIBUTING FACTORS TO THE NON-USAGE OF KMTS

During the interviews it emerged that not all participants were using KMTs in their work. As a result, participants were asked to indicate factors that contributed to them not to use KMTs. In order to be able to use any technology effectively, a person must be well equipped with the skills essential to using that technology. Mbatha and Ocholla (2011) argue that sometimes organisations just assume that their staff members possess the relevant skills only to realise later that this is not the case. To this end, one participant shared the following:
‘Other than the lack of skills and awareness of existing KMTs in the organisation, one of the major obstacles is that in some areas KMTs are not taken care of, it needs improvements and management drive. The other obstacle emanates from the lack of a well-structured KMTs system which has led to KMTs not being used to the fullest capabilities. I believe that this is due to the fact that there is no enforcement, or there is a lack of KMTs policy in the organisation.’

The findings above suggest that KMTs are available in the organisation but there is no enforcement, processes or structure in place. In order for the organisation to realise maximum benefit, there need to be some improvement and change management programmes. It must be noted that the availability of KMTs at Transnet suggests that improved service delivery can be anticipated. However, it is important to note that this availability does not necessarily imply that these tools are being used, because their usage is prohibited by a lack of skills, and proper policy.

Rogers (1995:15) argues that ‘one of the greatest pains accorded to human nature is the pain of a new idea.’ Thus, the fact that KMTs are available at Transnet does not necessarily suggest that they are being utilised. Anderson, Brynin, Gershung and Raban (2007:79), in their study on ICTs in society, observe that positive attitudes towards ICTs have a positive impact on both usage time and the depth of use. A positive attitude towards ICTs is promoted by the usefulness of the technology that is being used. A positive attitude towards ICTs is also promoted by possessing relevant skills and the ability to use technology and by understanding ICTs and their capabilities.
In order to be able to use any technology effectively, a person must be equipped with the skills necessary to use that technology. The issue of computer skills has always been a serious one in many countries including South Africa. In his study on the use of ICTs in government departments, Nwasike (2007:11) suggests that training should be made compulsory for civil servants, especially when there is a choice and access to training. The results indicate that as technology changes, so does the need for training in the use of evolving technologies.

Mbatha, Ocholla & Le Roux (2011) argue that organisations need to ensure that their employees are equipped with relevant skills in order to perform their daily work and activities. In support of these views, Mbatha (2009) is of the view that because of the governments’ persistent move towards the online environment (e-government), government employees need to be provided with programmes that will enable them to perform their work effectively with the ICT-related services they require. With the above as reference, it was crucial for this study to determine the major obstacles that prohibited the participants from adopting KMTs. Based on the findings above, it is clear that some of the obstacles included the need for sufficient and proper planning; lack of awareness on available KMTs, and lack of competencies to use KMTs.

4.6 KMTS BENEFITS

KMTs are adopted by organisations to bring some benefits in their operations as they are capable of enhancing work productivity and creativity. It was against this background that participants were required to comment on the benefits of using KMTs
at Transnet. It came up during the interviews that some of the participants were benefiting from using KMTs. One of the participants indicated the following:

‘You see, for me, KMTs make communication easier and cost reduction (travelling costs).’

The other participants shared that:

- ‘These technologies make it easy to retrieve old data when needed and they make it easier to share information.’
- ‘For me, it has to be increased efficiency, if something has been done and root cause completed, we can always refer to the previous experience and pattern of the occurrence through KMTs.’
- ‘You have enough information about your department or the organisation.’
- ‘These tools are helpful as they are capable of empowering employees with information stored on these KMTs.’

The findings above depict that KMTs provide a number of advantages to the organisation and have proved to be catalysts when it comes to improving communication, accessing information, sharing information, retrieving information, and disseminating information. In line with the findings above, Boughzala and Limayem (2012) observe that KMTs have the ability to gather all information residing in different systems applications platforms including experiences that people poses. They add that the impact and use of the KMTs should also make it possible to interact with one another. Furthermore, this process will enable employees to extract the necessary information through KMTs to obtain the relevant knowledge on a regular
basis (Boughzala & Limayem, 2012). Likewise, Gupta, Jatinder, Sharma, and Sushil (2004) supported by Maier (2007) note that knowledge management efforts normally focus on organisational objectives such as enhanced performance, innovation, competitive advantage, the sharing of lessons learned, continuous improvement of the organisation and integration.

One of the advantages of KMTs in an organisation is that they enable employees to learn about their organisation (Sanchez, 1996; Serenko, Bontis, Booker, Sadeddin, Hardie & Timothy, 2010). In support of these views, Dalkir (2013) says that the systematic coordination is achieved through creating, sharing, and applying knowledge as well as through feeding the valuable lessons learned and best practices into corporate in order to foster continued organisational learning.

4.7 CHALLENGES FOR ADOPTING KMTS

One of the themes that emerged during the interviews is the challenges for adopting KMTs at Transnet. As a result, participants were required to express their opinions on challenges that they had regarding the adoption of KMTs. This discussion emanated from the fact that not all participants were using KMTs in their jobs due to a number of reasons. Interestingly, some of the participants revealed that some of the employees were not embracing technology in the organisation. Also of note is that lack of awareness of KMTs was reported to be a contributing factor to the lack of adoption of KMTs. One of the participants shared the following:

‘For me, one of the major challenges is that some employees are either not committed or not aware of KMTs benefits.’
A number of participants expressed their unhappiness towards duplicated data that is stored in KMTs. One participant shared the following:

‘For me the challenge i have experienced and surely others have as well, is that sometimes when I look for a specific data, I would find duplicated data/records.’

Another challenge to the adoption of KMTs relates to useless data stored in KMTs. One participant expressed the following:

‘Eish, one of the challenges is that sometimes the stored data does not make any sense or bring any value.’

Some participants felt that one of the main challenges to the lack of adoption of KMTs was the lack of skills and knowledge about the existence of these technologies.

‘Lack of adequate training and awareness on KMTs.’

The findings above suggest that a number of challenges were hampering the adoption of KMTs at Transnet. It is worth mentioning that with regard to lack of skills, it is important to note that without the right human capacity, KMTs would surely lack someone to make use of them (Mutula & Van Brakel, 2007; Mbatha, Ocholla & Le Roux, 2011). A number of studies have looked at obstacles that prevent the use of technologies in organisations. In their study, Ebrahim and Irani (2005) established a number of challenges, namely: security and privacy, ICT infrastructure, and computer illiteracy. Likewise, Mutula and Mostert (2008) note that the main problems in many organisations in South Africa relate to the lack of ICT skills among employees. It has to be said that as technology evolves, so does the need for training with regard to
emerging technologies. It is true that if employees lack the necessary skills required to use KMTs, these tools would not be useful as expected. It is also quite correct that for KMTs to enhance work productivity and creativity at Transnet, employees need be trained to be able to use technology on their own.

### 4.8 TYPES OF KMTS USED TO MANAGE KNOWLEDGE

One of the objectives of the study was to describe types of KMTs that were adopted by Transnet to manage knowledge. It is important to note that many organisations have adopted technology in their operations to process, store, present and communicate information. As a result, many organisations have become so dependent on the technology such that they cannot operate without technology that guides and supports their operations. It is also correct to say a variety of technologies have influenced the methods of production in a number of organisations and often enhanced the methods of production control. It was against this background that participants were asked to comment on the types of technology they were using to manage knowledge. The study found that a number of ICTs were adopted to manage knowledge at Transnet. For example, one participant indicated the following:

‘SharePoint is mostly used in the organisation. However, this is just used to store documents such as shared repository.’

Social networks seem to be playing a significant role in managing knowledge. This was reported by one of the participants:
‘Within our team (IMS), communication has improved through the use of KMTs. We use WhatsApp, emails, and Lync. to communicate with one another. Transnet Corporate is also using Group SMS to communicate urgent matter to the employees.’

Davenport (2013), supported by Drucker (2013), observes that KMTs include but are not limited to the following: Intranet and internet, groupware – lotus notes, intelligence agents, experts systems, knowledge base, corporate and knowledge portals, data mining, decision-support systems, content and document management, customer relationship management (CRM) and customer-support technology. In line with the views above, Borghoff and Pareschi (2013) state that KMTs should formalize only knowledge which is stable and sanctioned. According to these authors, stability refers to the rate of change in the domain being modelled, relative to the speed with which these changes can be detected. Thus they add that as organisational structures change, as teams change, as employees skills change. It is important to note that this simply implies that in principle, as advances in the flexibility of knowledge representation are made, the linkage between the model and the domain being modelled could become tighter so that more dynamic classes of knowledge can be managed. Work practices become stable because they are sanctioned and sustained by the relevant stakeholders (Borghoff & Pareschi, 2013).

Khalili, et al. (2012) notes that the impact and evolving use of KMTs is to help people share knowledge through common storage so as to achieve economic re-use of knowledge, to help people locate each other and communicate through technology to achieve complex knowledge transfer. This can be achieved by having the right
technologies in place, i.e. video conferencing, tele-conferencing which connects people from various locations without the need to travel. Holtgrewe (2012) conducted a similar study where he discovered that technology has expanded from a tool for information management to a tool for communication. The use of social media technologies such as WhatsApp, Facebook, LinkedIn and other standard forms of information and communication technologies have enable the public to share knowledge, their views and insights.

In line with these findings, the activity theory purports that we are leaving in an constantly increasingly designed world, furnished with technologies at every turn. This is because of certain of its views that are encapsulated in the notion of people acting with technology (Kaptelinin & Nardi, 2006). It is worth mentioning that KM requires technologies to support the new strategies, processes, methods and techniques to better create, disseminate, share and apply the best knowledge, anytime and anyplace, across the team, across teams, across the organisation and across several organisations, especially its clients, customers, partners, suppliers and other key stakeholders (McInerney, (2002). However, Milosz and Milosz (2010) argue that as much as KM requires technology, there has been technology failure to support it. On the other hand, Lindner and Wald (2011) also contend that the lack of critical success factors is unfortunately common for most organisations. Leonardi and Treem (2012) argue that knowledge management technologies (KMTs) are not simple containers for storage of expertise, but that they are phases upon which individuals recommend performances of expertise. KMTs are often the primary site at which individuals present information about their behaviours to others, it would seem that there is
sufficient physical distance for the appearance of successful strategic self-presentations.

4.9 METHODS FOR CONVERTING TACIT KNOWLEDGE TO EXPLICIT KNOWLEDGE

The other important theme that emerged during the interviews relates to different methods and processes for converting tacit knowledge into explicit knowledge. This is a critical step in the knowledge management process. Hence participants were asked to share their knowledge on the methods that Transnet had put in place to manage knowledge. The study found that actually the organisation had adopted just ordinary methods of converting tacit knowledge into explicit knowledge. These include discussions between experienced and junior people. As a matter of fact, there is no better way of converting tacit knowledge into explicit knowledge than bringing together the two parties mentioned above. One of the participants shared the following:

‘As far as I know, there are one-on-one sessions as well as team meetings which include discussing the goals each department must achieve and what could prevent the goals to be achieved.’

Some of the participants indicated the following:

‘Process document for specific actions or tasks I perform daily and through to more collaboration sessions.’

The findings suggest that open discussions or one-on-one meetings are currently the preferred method for converting tacit knowledge into explicit knowledge. In support of these findings, Nonaka, et al. (2000) observe that the methods and processes to
convert tacit knowledge into explicit knowledge include the interaction level (individual or group) and media type (face-to-face or virtual), which results in four types of ‘Ba’ which are: originating, dialoguing, systemising and exercising. Nelson and McCann (2010) note that one way to ensure knowledge retention is to retain the organisation’s knowledge workers through sharing experiences. In line with the views above, Martins and Meyer (2012) argue that it is important for organisations to identify the knowledge that is valuable so that it can be preserved by the organisation because not all tacit knowledge can be retained within organisations and this can be done by sharing experiences through discussions.

4.10 SUMMARY

This chapter has presented the findings from the field. Data was collected through face-to-face interviews. Thematic categorization was used to analyse data. The next chapter (Chapter 5) has the conclusion and recommendations of this study.
CHAPTER FIVE
SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter summarises, concludes, and makes recommendations based on the findings. It is presented based on the objectives of the study, which are as indicated below:

- Impact and evolving use of KMTs at Transnet;
- Methods to convert and/or transfer tacit knowledge into explicit knowledge;
- Effective knowledge sharing platform with the organisation’s well-defined processes.

The chapter further discusses a conceptual model built in this study to address the gaps in KMTs. Also the limitations of the study are discussed.

5.2 SUMMARY OF FINDINGS

The summary of findings is discussed under the following: types of KMTs used to manage knowledge, KMTs’ benefits in an organisation, methods for converting tacit knowledge into explicit knowledge, impact and evolving use of KMTs, status of KMTs in state-owned companies, contributing factors to non-use of KMTs, and challenges for adopting KMTs.
5.2.1 Types of KMTs used to manage knowledge

There are many types of KMTs that can be adopted in an organisation to preserve knowledge. It is important to note that Transnet has adopted different types of technologies in its operations to process, store, present and communicate information. It is also correct to say a variety of technologies have influenced the methods of production in a number of organisations and often enhanced the methods of production control, and this was also the case at Transnet. Social networks such as WhatsApp were reported to be playing a significant role in managing knowledge. Also ICT applications such as SharePoint were adopted to store documents such as shared repository. Likewise, e-mails and Group SMS were used to communicate urgent matters to the employees.

5.2.2 KMTs’ benefits in an organisation

KMTs adopted at Transnet seem to be bringing a number of benefits in its operations as they were reported highly influential in enhancing work productivity and creativity. It came up during the interviews that some of the participants were benefiting from using KMTs. The findings depict that KMTs provide a number of advantages to the organisation and have proved to be catalysts when it comes to improving communication, accessing information, sharing information, retrieving information, and disseminating information.
5.2.3 Methods for converting tacit knowledge into explicit knowledge

One of the themes that emerged during the interviews relates to different methods and processes for converting tacit knowledge into explicit knowledge. It must be noted that this is one of the vital steps in the knowledge management process. The findings depict that Transnet had adopted just ordinary methods of converting tacit knowledge into explicit knowledge. These included discussions between experienced and junior people. The findings suggest that open discussions or one-on-one meetings are currently the preferred method for converting tacit knowledge into explicit knowledge.

5.2.4 Impact and evolving use of KMTs

The study found that KMTs are playing a significant role when it comes to facilitating sharing and storing of information. In addition, the findings depict that KMTs have improved communication at Transnet. Contrary to the finding above that the impact of KMTs is felt in a sense that workers can use these technologies to share and store information, and also improve communication within the organisation, it emerged during the interviews that not all participants were enjoying the benefits of these technologies. There is no escaping the fact that in a working environment, for employees to adopt technology they need to be made aware of that particular technology so that they fully embrace it. Clearly the findings suggest that KMTs have a strong impact in the operations of the organisation. Also KMTs are playing a significant role in improving work productivity and creativity at Transnet. Moreover, the findings depict that KMTs have a strong impact when it comes to increasing access to information and increasing methods of preserving knowledge.
Furthermore, the study found that some of the participants were of the view that KMTs were important at Transnet such that their non-existence might affect the operations in the organisation which may result in a lack of work productivity and creativity. Although not all the participants shared similar views, it is a good thing to know that some of the participants were of the opinion that without KMTs the organisation may not be able to perform to its capacity. This is because KMTs have proved to be catalysts when it comes to sharing and preserving knowledge in the organisation.

5.2.5 Status of KMTs in state-owned-companies

It was important for this study to ascertain whether the participants were aware of what was happening in other organisations in as far as the adoption of KMTs was concerned. The study found that participants had different views on this issue. Some of the participants were of the view that some state-owned companies had already adopted these technologies and were at advanced stages of usage. It is good to know that Transnet had adopted latest technologies to manage knowledge. Contrary to the findings above, not all participants were holding similar views on the status of KMTs at Transnet and in other state-owned companies. The study established that some of the participants could not comment on the KMTs status of other state-owned companies because they had little or no knowledge of what was happening in those companies. However, these participants could only comment on KMTs status of Transnet where they were employed.
5.2.6 Contributing factors to non-use of KMTs

There were quite a number of factors that hindered the effective use of KMTs at Transnet. The study unearthed that not all participants were using KMTs at Transnet. The hindrances included lack of skills amongst employees, and non-existence of proper policy on the adoption of KMTs. Some of the obstacles included the need for sufficient and proper planning; lack of awareness on available KMTs, and lack of competencies to use KMTs.

5.2.7 Challenges for adopting KMTs

There were quite a number of challenges that prevented the adoption of KMTs at Transnet. The study found that not all participants were using KMTs in their jobs due to a number of reasons. Some of the challenges or reasons that prevented the adoption of KMTs are:

- Lack of training and awareness on KMTs
- User involvement and communication during the implementation of KMTs

There were also a number of participants who expressed their unhappiness towards duplicated data that is captured in KMTs. Another challenge to the adoption of KMTs relates to useless data stored in KMTs and lack of skills and knowledge about the existence of these technologies.

5.3 CONCLUSION
The conclusion is based on the followings themes that emerged during the interviews: types of KMTs used to manage knowledge, KMTs’ benefits in an organisation, methods for converting tacit knowledge into explicit knowledge, impact and evolving use of KMTs, status of KMTs in state-owned companies, contributing factors to non-use of KMTs, and challenges for adopting KMTs.

5.3.1 Types of KMTs used to manage knowledge

It can be concluded that Transnet adopted a number of technologies to manage knowledge. This is most likely to be attributed to the fact that Transnet understands the significant role that technology plays in managing knowledge. Also, this may imply that Transnet understands the importance of managing knowledge. Transnet adopted KMTs to enhance its operations in as far as the processing, storing, presenting and communicating of information is concerned. It is worth mentioning that the adopted KMTs have influenced the methods of information production and always enhanced the methods of production control. The KMTs that were adopted include social networks, such as WhatsApp, that were reported to be playing a significant role in managing knowledge. Also an ICT application such as SharePoint was adopted to store documents in a shared repository. Likewise, e-mails and Group SMS were used to communicate urgent matters to the employees.

5.3.2 KMTs’ benefits in an organisation

Based on the findings of the study, it is axiomatic that KMTs were playing a significant role in improving work productivity and creativity in the organisation. These
technologies were adopted to add value in the organisation and to some extent they seem to be doing just that, of course with more improvement still required. It came up during the interviews that some of the participants were benefiting from using KMTs. KMTs were providing a number of advantages to the organisation when it comes to improving communication, accessing information, sharing information, retrieving information, and disseminating information.

5.3.3 Methods for converting tacit knowledge into explicit knowledge

Methods and processes for converting tacit knowledge into explicit knowledge are critical in the organisation. The organisation had adopted just ordinary methods of converting tacit knowledge into explicit knowledge. These include discussions between experienced and junior people. It is worth noting that open discussions or one-on-one meetings are currently the preferred method for converting tacit knowledge into explicit knowledge.

5.3.4 Impact and evolving use of KMTs

KMTs were reported to be improving communication at Transnet. Of course not everyone seems to be agreeing. Contrary to this, not all participants were enjoying the benefits of these technologies. Clearly KMTs have a strong impact in the operations of the organisation. Also these technologies are playing a significant role in improving work productivity and creativity at Transnet. Moreover, it can be concluded that KMTs had a strong impact when it comes to increasing access to information and increasing methods of preserving knowledge. It must also be mentioned that KMTs are important
at Transnet, such that their non-existence might affect the operations in the organisation which may result in a lack of work productivity and creativity. Notwithstanding the fact that not all the participants shared a similar view, it is encouraging to know that some of the participants were of the opinion that without KMTs the organisation may not be able to perform to its capacity. This could simply be attributed to the fact that KMTs have proved to be catalysts when it comes to sharing and preserving knowledge in the organisation.

5.3.5 Status of KMTs in state-owned companies

The status of KMTs in state-owned companies seems to vary from organisation to organisation. Some state-owned companies had already adopted these technologies and were at an advanced stage of usage. The findings suggest that some of the participants had positive comments to say on the matter, which is a good thing given the fact that organisations are spending a lot of money and resources to make sure that knowledge is managed for future reference and the betterment of the organisation. Also, it is good to note that Transnet had adopted latest technologies to manage knowledge. It emerged that many participants could not comment on the KMTs status of other state-owned companies because they had no idea of what was happening in these companies. However, these participants could only comment on KMTs status of Transnet where they were employed. It is interesting to note that at Transnet there were some participants who were not using KMTs to improve the way they were doing their work.
5.3.6 Contributing factors to non-use of KMTs

There were a number of factors that hampered the adoption of KMTs at Transnet. These factors include lack of enforcement, processes, and proper policy on the use of KMTs. In addition, some of the major obstacles included the need for sufficient and proper planning, lack of awareness on available KMTs, and lack of competencies to use KMTs. In order to be able to use any technology effectively, a person must be equipped with the skills necessary to use that technology. The issue of computer skills has always been a serious one in many countries, including South Africa.

5.3.7 Challenges for adopting KMTs

A number of challenges were affecting the adoption of KMTs at Transnet. One of these is the lack of awareness of KMTs. A number of participants expressed their unhappiness towards duplicated data that is stored in KMTs. Another challenge to the adoption of KMTs relates to useless data stored in KMTs. Also, lack of skills and knowledge about the existence of KMTs were among the challenges.

5.4 RECOMMENDATIONS

The recommendations are discussed under the following: types of KMTs used to manage knowledge, KMTs’ benefits in an organisation, methods for converting tacit knowledge into explicit knowledge, impact and evolving use of KMTs, status of KMTs at Transnet as one of the state-owned companies, contributing factors to non-use of KMTs, and challenges for adopting KMTs.
Although Transnet has adopted different types of technologies in its operations, more KMTs need to be adopted to store, present and communicate information. More KMTs that are capable of influencing the methods of production should be identified and adopted. With regards to the benefits of using KMTs in the organisation, the study recommends that there should be more awareness on the benefits of KMTs so that all employees make use of them. These are highly influential in enhancing work productivity and creativity. It is axiomatic that converting tacit knowledge into explicit knowledge is one of the vital steps in the knowledge management process. Therefore, the organisation should identify more methods and strategies that can be adopted to convert tacit knowledge into explicit knowledge. Notwithstanding the fact that KMTs were reported to be playing a significant role when it comes to facilitating sharing and storing of information, there were some participants who could not attest the same. Therefore, the study recommends that more KMTs be adopted to have a stronger impact in the knowledge management process.

Given the fact that participants had different views regarding the status of KMTs at Transnet as one of the state-owned companies in South Africa, the study recommends that government should encourage all its entities to identify and adopt KMTs to improve work productivity and creativity. Also, the study recommends that all state-owned companies share their best practices emanating from the adoption of KMTs so that everybody in these entities has an idea of what is happening.

A number of factors were hindering the effective use of KMTs at Transnet. The hindrances included lack of skills amongst employees, and non-existence of proper policy on the adoption of KMTs. Some of the obstacles included the need for sufficient
and proper planning; lack of awareness on available KMTs, and lack of competencies to use KMTs. It is, therefore, recommended that all employees get equipped with ICT skills and all other skills that are required to use and understand how KMTs function. In addition, the study recommends that a proper policy on the adoption of KMTs be adopted and all employees be made aware of such a policy. With regards to challenges that prevent employees from using KMTs, the study revealed that some of the challenges included the following: non-adoption of KMTs, and lack of awareness of KMTs. Some participants expressed their unhappiness towards duplicated data that is captured in KMTs and useless data stored in KMTs and lack of skills and knowledge about the existence of these technologies. Therefore, the study recommends that training be provided to ensure that all employees are able to use KMTs effectively. Also, the study recommends that measures for quality assurance be put in place to ensure that there is no duplicated data and the information that is stored is actually of quality.

5.4.1 Future research topics

This section recommends future topics related to knowledge management technologies in state-owned-companies.

Below are the future recommended topics:

- The value, benefits realisation and adoption of the knowledge management technologies in state-owned-companies.

- Effective use of knowledge management technologies towards digitisation.

5.5 CONCEPTUAL FRAMEWORK
This section presents a conceptual framework developed to assess the impact and evolving use of knowledge management technologies. The study was conducted at Transnet Enterprise Information Management Service (Head Office - EIMS) and Operating Divisions (IMS). The activity theory was used to unpack the study, as discussed in the previous chapters. Borrowing from the activity theory and also based on the findings of the study, it was clear that the theory to be designed needed to have specific elements or components, such as input and output and KM cycle.

**Figure 5.1: Conceptual framework for KMTs in this study**
The conceptual framework above addresses the impact and evolving use of knowledge management technologies and is divided into various sections as indicated below:

(i). Input

(ii). KM lifecycle

(iii). Transformation and classification of knowledge

(iv). Output – impact and use of KMTs, through KM hub (collaboration and innovation):

i. Input – the first step which is ‘input’ conceptualises the model as the start for the KM lifecycle which includes the creation of knowledge. It involves people and processes.

ii. The second step on the conceptual framework presents the knowledge management lifecycle which covers the stages of KM that cannot go in isolation from technology elements. This involves records management, document management, web content management, and archives.

iii. The third element of the framework is the processing of information into knowledge. This is done in the form of transformation and knowledge being classified into two types of knowledge, which are tacit and explicit knowledge. This step is enabled by the use of knowledge management technologies.

iv. Output – the last step is the output which reflects the impact and evolving use of KMTs. This presents the goal of this research study with the final product as KM hub for collaboration and innovation, where employees share knowledge and ideas.
Different technologies are grouped and detailed in the stage of knowledge management lifecycle.

The literature review suggest that, it is crucial for building and sustaining the organisation’s competencies through making knowledge available to the right people at the right time (Davenport, 2013; Mbatha, 2013; Drucker, 2013). The conceptual framework developed addresses the issue of making knowledge available to the right people at the right time. This was realised through the four sections of the framework which are input, KM lifecycle, knowledge transformation and classification and output with impact and use of KMTs through the KM hub which is collaboration and innovation, where employees share ideas.

5.6 LIMITATION OF THE STUDY

Like any other investigation, this study is not free of limitations, as it was carried out at Transnet, a state-owned company. It means that the findings cannot really be generalized to other sectors or organisations unless done with caution. Some limitations specific to this study are:

- Limited literature about Knowledge Management Technologies for State-Owned Companies.
- This study was limited to only the EIMS and IMS within the organisation.
- Time constrains were part of the limitations as not every employee within the business units could participate.
- Difficulties were encountered by participants in being able to accurately remember, as they do not capture activities as they happen.
• In some instances, participants were cautious about revealing information that may be deemed to undermine their superiors or themselves.

LIST OF REFERENCES


ADDENDUM A

INFORMATION LEAFLET AND INFORMED CONSENT

PROJECT TITLE: Impact and Evolving Use of Knowledge Management Technologies in State-Owned-Companies

Primary investigator: Mr TD Manamela

Study leader: Prof B Mbatha, PhD, Department of Information Systems
Dear Potential research participant,

You are invited to participate in a research study that forms part of my formal MTech-studies. This information leaflet will help you to decide if you would like to participate. Before you agree to take part, you should fully understand what is involved. You should not agree to take part unless you are completely satisfied with all aspects of the study.

WHAT IS THE STUDY ALL ABOUT?

This research study investigates and assesses the impact and evolving use of Knowledge Management Technologies (KMTs) in the state-owned-company. The research goes further to assess methods and process on how Transnet as an organisation can retain tacit knowledge from individuals within and leaving the organisation.

Problem statement, lack of evaluation on the impact and use of Knowledge Management Technologies, benefits tracking, collaboration and innovation, knowledge sharing, KM processes, awareness, understanding of knowledge management, adoption of KM technologies and activities introduced by knowledge management which leads to organisation’s operating divisions functioning in silo.
The goal for the research is to:

- Conceptualise a framework to address the impact and evolving use of knowledge management technologies at Transnet EIMS and IMS Business Units.

The objectives of the study

- To investigate the impact and evolving use of knowledge management technologies
- To explore the different methods to retain tacit knowledge through converting tacit knowledge into explicit knowledge and close the process gaps
- Determine an effective knowledge sharing platform with the Transnet well-defined processes for capturing and retain knowledge which will result in improved decisions making and cost savings.
- To enable the Transnet processes to be effective and efficient resulting in enhanced response to service delivery

WHAT WILL YOU BE REQUIRED TO DO IN THE STUDY?

If you decide to take part in the study, you will be required to do the following:

- To sign this informed consent form
- To spent time with the researcher on a one to one interview session
- The interviews will require approximately 30 minutes of the participant’s time.
ARE THERE ANY CONDITIONS THAT MAY EXCLUDE YOU FROM THE STUDY?

You will not be eligible to take part in the study if you do not fall under EIMS and IMS departments, as this research study, data collection is based on those functional areas of business and also, if you do not have insight of KMTs.

CAN ANY OF THE STUDY PROCEDURES RESULT IN PERSONAL RISK, DISCOMFORT OR INCONVENIENCE?

**Interviews:** The study and procedures involve no foreseeable physical discomfort or inconvenience to you or your family.

**Physical exhaustion:** The location and duration of the interview poses no harm to you as a participant.

**Emotionally sensitive interviews:** There will be no sensitive questions about you or your family in the interview that may cause you emotional harm.

**Minimal risk/discomfort/inconvenience:** Participation in the study involves no risks whatsoever and/or inconveniences one encounter in daily living.

WHAT ARE THE POTENTIAL BENEFITS THAT MAY COME FROM THE STUDY?
The potential benefits will be to the organisation, to track the value of the implemented knowledge management technologies.

**WILL YOU RECEIVE ANY FINANCIAL COMPENSATION OR INCENTIVE FOR PARTICIPATING IN THE STUDY?**

This research study is purely undertaken for the purpose of academic qualification. There is no financial reward for this study.

**WHAT ARE YOUR RIGHTS AS A PARTICIPANT IN THIS STUDY?**

Your participation in this study is entirely voluntary. You have the right to withdraw at any stage without any penalty or future disadvantage whatsoever. You don’t even have to provide the reason/s for your decision. Your withdrawal will in no way influence your continued care and relationship with the health care team. Note that you are not waiving any legal claims, rights or remedies because of your participation in this research study.

**HOW WILL CONFIDENTIALITY AND ANONYMITY BE ENSURED IN THE STUDY?**

All the data that you have provided through the interviews will be treated as strictly confidential. Therefore, this mean that access to your data will be strictly limited to the researcher, the supervisors of the study and the designated examiners (appointed by Tshwane University of Technology). If this research get published to the scientific journals or presented to a conference, identity of any participant who took part on questionnaire will not be revealed to anyone. All the original questionnaires will be
stored in a safe place for three years, after which they will be destroyed.

**IS THE RESEARCHER QUALIFIED TO CARRY OUT THE STUDY?**

The researcher is satisfactorily trained and qualified researcher in the study fields covered by this research project, specifically in information and communications technology as he holds B-TECH Business Information Technology.

**HAS THE STUDY RECEIVED ETHICAL APPROVAL?**

Yes. Faculty Committee of Postgraduate Studies and Faculty Committee of Research Ethics of the Faculty of ICT, Tshwane University of Technology have approved the formal study proposal.

**WHO CAN YOU CONTACT FOR ADDITIONAL INFORMATION REGARDING THE STUDY?**

The primary investigator is, Mr TD Manamela, whom can be contacted on 0113083856 during office hours or his cell number is 0825802389. The study leader was Prof B Mbatha, whom can be contacted on 0124298264 during office hours. The co-study leader is Mr P Pretorius, can be contacted on 0123829287 during office hours. Should you have any question regarding the ethical aspects of the study, you can contact the chairperson of the TUT Faculty of ICT Research Ethics Committee, Dr AB Pretorius, during office hours at Tel (012) 382 9965/9536/9689, eMail PretoriusAB1@tut.ac.za.
Alternatively, you can report any serious unethical behaviour at the University’s Toll Free Hotline 0800 21 23 41.

DECLARATION: CONFLICT OF INTEREST

I declare that the study will be conducted purely for academic purpose and there is no financial reward for this study. Therefore, there is no potential gain with this research.

A FINAL WORD
Your co-operation and participation in the study will be greatly appreciated. Please sign the informed consent below if you agree to participate in the study. In such a case, you will receive a copy of the signed informed consent from the researcher.
CONSENT

I hereby confirm that I have been adequately informed by the researcher about the nature, conduct, benefits and risks of the study. I have also received, read and understood the above written information. I am aware that the results of the study will be anonymously processed into a research report. I understand that my participation is voluntary and that I may, at any stage, without prejudice, withdraw my consent and participation in the study. I had sufficient opportunity to ask questions and of my own free will declare myself prepared to participate in the study.

Research participant’s name: ___________________________ (Please print)

Research participant’s signature: _________________________

Date: __________

Researcher’s name: ___________________________________ (Please print)

Researcher’s signature: ________________________________

Date: __________
VERBAL CONSENT

(Applicable when participants cannot read or write)

I hereby declare that I have read and explained the contents of the information sheet to the research participant. The nature and purpose of the study were explained, as well as the possible risks and benefits of the study. The research participant has clearly indicated that he/she is aware of the right to withdraw from the study at any time, for any reason and without jeopardizing his/her relationship with the research team. I hereby certify that the research participant has verbally agreed to participate in this study.

Research participant’s name: ________________________________ (Please print)

Researcher’s name: ________________________________ (Please print)

Researcher’s signature: ________________________________

Date: ___________
PARENTAL INFORMED CONSENT

(Applicable when participants are younger than 18 years old)

I hereby confirm that I have been adequately informed by the researcher about the nature, conduct, benefits and risks of the study. I have also received, read and understood the above written information. I am aware that the results of the study, including personal details regarding my child, will be anonymously processed into a research report. I understand that his/her participation is voluntary and that he/she may, at any stage, without prejudice, withdraw his/her assent and participation in the study. He/she has had sufficient opportunity to ask questions and I, of my own free will, declare that my child can participate in the above-mentioned study.

Research participant’s name: ________________________________ (Please print)

Research participant’s parent/guardian’s name: ________________________________ (Please print)

Research participant’s parent/guardian’s signature: ________________________________

Date: ______________
CHILD ASSENT FORM

(Applicable when participants are younger than 18 years old)

I, ......................................................... (print full name), understand that my parent(s)/guardian(s) has given permission (said it is okay) for me to take part in the research project. I am taking part because I want to and not because I’m forced to do so. I have been assured that I can stop at any time I want to without getting into any trouble (nothing bad will happen to me and nobody will be mad at me if I want to stop). Also, I can always ask the researcher any question about the study.

Signature/Name
APPENDIX B

Interview Questions

The purpose of this interview is to get participants opinions on the impact and evolving use of Knowledge Management Technologies in state-owned-companies. Also, how knowledge is captured and shared through KMTs.

The answers/views to the interview questions are strictly confidential. Your participation to this interview is voluntary and much appreciated.

The Impact of KMTs

In your opinion, do you think KMTs have any impact to the operations of the organisation and your daily work activities? Why? If it has any impact, from which perspective?

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

In your opinion, what is the current state of KMTs in the state-owned-companies? Why?
During strategic planning sessions, how frequently is the impact of KMTs assessed to ensure that the organisation get maximum value from the KMTs? Please elaborate on the answer given:

The Evolving Use of KMTs

In your opinion, what are the advantages and disadvantages of the evolving use of KMTs in your organisation?

In your opinion, what are the current challenges faced by the organisation in using KMTs?

In your organisation, how is the senior management willingness and drive to ensure that KMTs are functional?
How does your organisation use KMTs to manage the knowledge?

Methods to Retain Tacit Knowledge

In your organisation, what methods or processes are being applied to convert tacit knowledge into explicit knowledge?

What does the concepts “tacit and explicit knowledge” mean in your own understanding?

In your organisation, how do the employees share tacit knowledge with each other?

Effectiveness of Knowledge Sharing
Have there been knowledge sharing activities that were started and then challenged/failed? If yes, explain the lessons learned for the failure.

_____________________________________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________

How does your organisation recognise knowledge as part of empowering its employees?

_____________________________________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________

In your opinion, does your organisation provide an open environment for knowledge sharing?

_____________________________________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________

**Processes in Capturing Knowledge**

What knowledge management capturing processes or KMTs exist in your organisation? Which of these processes or KMTs are shared amongst EIMS and IMS employees within the organisations?

_____________________________________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________

Does your organisational culture encourage employees to create, capture, share and use the knowledge?
KMTs impact on improving or enhancing performance or service delivery

How can your organisation sustain knowledge to improve individual and team performance?

In your opinion, what is the main focus in your organisation by applying KMTs?