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KNOWLEDGE SHARING AS A MEANS OF ENHANCING INTELLECTUAL CAPITAL WITHIN THE PROJECT ENVIRONMENT

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Declaration

I certify that the *minor dissertation* submitted by me for the degree *Master's of Commerce (Business Management)* at the University of Johannesburg is my independent work and has not been submitted by me for a degree at another university.

_______________________________
(Name in block letters – no signature)
Abstract

Knowledge sharing (KS) is one of the most important knowledge management (KM) processes that enable value adding KM initiatives within the organisation. The flow of knowledge between individuals within the organisation, leads to the creation and enhancement of intangible assets known as intellectual capital (IC) through the process of combination and contextualisation of different pieces of knowledge. This intangible asset known as IC, is regarded as the unique competitive advantage of the organisation due to the difficulty to imitate by the competitors. In the context of the project environment, IC plays an integral role in improving the project management (PM) capability and competencies while also creating a knowledge base. This research focuses on the investigation of KS as the means of enhancing IC within the project environment of a South African power utility (SAPU).

The SAPU currently involved in the construction of many projects across South Africa has the opportunity to create and enhance IC through the use of KM processes such as KS that will become beneficial in terms of improving project planning and execution due to enhanced competencies and PM capability. Currently there are KS practices that are taking place within the SAPU’s project environment, however, certain major challenges are hindering this process which results in a lost opportunity to enhance IC and build sufficient capacity to improve on project execution. The respondents of this study agreed to the value of KS as a means of enhancing IC with the SAPU’s project environment by acknowledging its potential of improving PM capability, enhancing the competencies and building a knowledge base. Certain key recommendations that were considered critical for the success of KM processes such as KS included the following:

1. Leadership should champion the development and implementation of KM programs within the SAPU’s project environment.
2. KM should be integrated within the project life cycle model (PLCM) to become part of projects within the SAPU.
3. Enforced governance and rewards as well as recognition systems are recommended for promoting KS in the SAPU’s project environment.
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City of Johannesburg (CoJ)

Engineering Instruction Manual (EIM)

Information and Communications Technology (ICT)

Information Management (IM)

Intellectual Capital (IC)

Intellectual Property (IP)

Key Performance Indicators (KPIs)

Knowledge Based View (KBV)

Knowledge Creation (KC)

Knowledge Sharing (KS)

Learning Organisation (LO)

Lessons Learnt (LL)

New Public Management (NPM)

Price Waterhouse Cooper (PWC)

Project-Based Organisation (PBO)

Project Definition Readiness Assessment (PDRA)

Project Life Cycle Model (PLCM)

Project Management Body of Knowledge (PMBOK)

Project Management Centre of Excellence (PMCoE)

Project Management Institute (PMI)
Project Management Office (PMO)

Project Management Plan (PMP)

Project Management System (PMS)

Resource Based View (RBV)

South African Power Utility (SAPU)

Skills and Knowledge Transfer (SKT)
CHAPTER 1

INTRODUCTION

The main objective of this research was to investigate the role of KS as a means of enhancing IC within a project environment. This issue encompasses uncovering the perceptions of project managers towards KS, KS challenges in the project environment as well as feasible and viable strategies that can be utilised to encourage, implement and improve KS within the project environment of the SAPU. Through effective KS, the organisational IC can be preserved and re-utilised. Taking into cognisance that projects have a start point and an end, it is of the utmost importance to preserve the IC for future projects' baselines and improvements. This research will be confined within the boundaries of the project environment of the SAPU currently involved in the construction of power stations within South Africa.

1.1. Background and rationale of the study

Knowledge has become an invaluable resource for many organisations operating in the hypercompetitive business environment (Kannabiran & Pandyan, 2010:335). The project environment within the SAPU is not an exception to such organisations. As the organisation is continuously involved in projects, managing and preserving its IC through the use of KS become imperative for the lifetime of the projects, especially considering the complex nature of the construction projects within the electricity industry. Countries such as South Africa are not actively and continuously involved in the management of projects such as the construction of power stations, therefore such skills and competencies are not readily available when required. For this reason, it is vital that the IC created during times of construction is preserved throughout these projects in order to establish a baseline for building skills and capacities necessary to effectively manage the complexity and magnitude of such projects.
Since early 2008, the SAPU relevant to this research has implemented various initiatives in an attempt to manage its IC effectively. The undertaking of construction of new power stations by the SAPU after an almost 20 year pause in such endeavours also marked a renewed interest in KM initiatives by the company. The attempt of the organisation to become more project oriented in nature also played a pivotal role. PM principles became important in this era within the organisation, hence the organisation's focus to become a project-based organisation (PBO) (Eskom, 2008:2).

This study will focus on the utilisation of KS as a means of enhancing IC within the SAPU's project environment. The premise of the study is based on the grounds that the current construction projects are not a permanent phenomenon within the organisation, but might resume in the future as the demand for power supply increases or when some of the existing power plants are retired. Therefore, failure to share knowledge as a means of enhancing IC, will result in lost opportunities to learn and improve on future projects. According to Hanisch, Lindner, Mueller and Wald (2009:149), the impermanent nature of projects and their perpetual uniqueness makes organisational learning difficult in the project environment. Ajmal, Helo and Kekäle (2010:157) also support the above view by emphasising that staff rotations and resignations during the course of the project are barriers to learning within the project environment. In addition to the above mentioned limitations with regards to KS within the project environment, Kang (2007:127) and Koskinen (2010:154) agree that sometimes projects are separated from each other and organisational knowledge is therefore scattered across different projects.

The SAPU's project environment is a true reflection of the above mentioned scenarios as projects are currently being executed in parallel at different locations across South Africa. The complex nature of these kinds of projects brought about by their magnitude also makes it difficult for effective KS. The project is usually treated as a programme with various sub-projects within it. This entails the execution of certain activities at the same time but at different project sites. For example, a project is packaged according to units, ranging from unit 1 to unit 6. These units are constructed almost in parallel, at the same time with certain activities taking place simultaneously; this leads to knowledge
being scattered across the project, as different individuals are doing the same things, on different sites. It is likely that in some instances project managers working within the same large project, sometimes do not even know each other, and as a result cross-project and cross-phase KS and learning cannot take place (Sikora, 2015).

With these issues threatening the preservation of organisational knowledge, Jafari, Resaeenour, Masdeh and Hooshmandi (2011:310) highlight the importance of implementing a KM process to ensure protection of the organisation’s IC. Leseure and Brookes (2004:103) conclude that the only way to overcome the above mentioned limitations and ensure that organisations leverage their PM capabilities for competitive advantage, is that KM and PM should complement each other. The idea of integrating KM and PM, especially within complex projects such as the construction of power stations is therefore vital.

Many organisations involved in the execution of projects are guided by the project management body of knowledge (PMBOK) which emphasises the importance of retrospective learning through documentation of lessons learnt (LL) during project closure phase according to the Project Management Institute (PMI) (2013:57). It can, however, be noted that if this exercise is left until the end of a project, it is usually too late for improving the project performance across repeatable project activities or timely cross learning with other organisational projects in planning or execution. In such a case, the organisation has lost an opportunity for identifying early warnings and to effectively plan similar projects that may either already be in a planning or execution phase (Akhavan, Zahedi & Hosein, 2014:99). The integration of KM and PM will facilitate KS throughout a PBO, thereby sufficiently enhancing IC throughout the project lifespan.

The development of IC through KM processes such as KS, in order to improve project efficiency and performance, has become the driving force for KM implementation within PBOs (Eskom, 2009:2). Project efficiency refers to improved project performance as a result of reduced task times, reduction of project cost, reduction of project duration, improved quality of work and reduced fatalities. In order for the organisation to improve on its project efficiency, a learning process needs to take place (Eskom, 2012a:13).
Learning within a project environment refers to the process of improving an organisation's efficiency in project execution as a result of repeated individual project tasks. Individuals within the project therefore learn by repeatedly executing project tasks which should result in the improvement of project performance for current and future project tasks (Tukel, Rom & Kremic, 2008:180).

In the context of the SAPU in question, the task of implementing KM as a means of leveraging IC in the project environment became more and more challenging due to different factors, which are typically present in the nature of the project environment. One challenge is that project managers are rightly concerned with the scope, budget and timeline of the projects, leading to knowledge preservation not being prioritised and being rather neglected at times (Eskom, 2009:2). Shokri-Ghasabeh and Chileshe (2014:112) also acknowledge this challenge by stipulating that many researchers have discovered that preservation of knowledge is mostly not a priority in construction projects.

KM is usually never catered for in the project definition, which then makes it even more difficult to retrofit KM practices as the projects are underway. The SAPU follows a PLCM, which guides and governs the projects throughout their lifespan. It is within this PLCM that mandatory project requirements are enlisted and KM is excluded. This represents a challenge as KM is not a requirement and it is solely the discretion of the project manager to allocate time and resources for KM interventions (Eskom, 2010a:6).

Another challenge to leveraging IC through KM in a project environment is the non-permanent nature of projects which poses a risk to the organisation since failure to capture the acquired knowledge within the project life span results in the loss of IC at the end of a project. According to Hill (2014:109), in the understanding of a project as something that has a start and end date, KS and the capturing of LL throughout the duration of a project is imperative for building and enhancing IC within the organisation.

According to Lilleoere and Hansen (2011:54) KS is strongly believed to be the enabler towards IC creation, thereby unleashing organisational innovation. Taking this into
consideration, it becomes evident that KS is an integral part of IC enhancement within the organisation, which further supports the focus of this research. It must, however, be taken into account that knowledge preservation is not always ignored intentionally, time constraints are usually an issue as well (Forstenlechner & Lettice, 2007:825) or rather, the current KM interventions become add-ons to the existing projects' scopes. Kaj and Pekka (2008:116) also indicate that time and resource constraints are, among others, the cause of poor commitment to KS initiatives by project teams. They further indicate that optimistic project time schedules exacerbated by resource constraints, lead to unpleasant responses from the project teams towards suggested KS initiatives. This is also evident in the project environment of the SAPU which is currently highly focused on the construction of numerous power stations.

Based on the assessment undertaken by KM consultants within the SAPU, specifically within the power stations, it is evident that there are KS practices that are taking place within the organisation, both formalised and non-formalised (Eskom, 2009:9). An example of a formal KS practice identified during the assessment includes a two day off-site knowledge capturing exercise and site visits with project teams that worked on one of the power stations; these teams are known as the "go and see teams" (Eskom, 2008:2).

It must be noted that project managers and project teams are not always unaware of or unwilling to recognise the value and importance of KM practices in KS interventions. It is vital to take into cognisance that KS interventions are taking place within the project teams, however, the challenge is to ensure that those practices are formalised, encouraged, embraced and become cross project initiatives. As mentioned, most of the interventions take place within the confines of a project without the involvement of other projects. With reference to a report from the gap analysis that was conducted by a consulting company at the SAPU in 2014, specifically between the two biggest power stations currently in construction, it was evident that KS between the two projects was still a concern and as a result the IC gained throughout these projects was being lost (Eskom, 2014a:2).
According to the assessment that was conducted by the project management centre of excellence (PMCoE) and project management office (PMO) within the SAPU, a large amount of knowledge is lost as project managers are rotated across projects or resign. Project managers resign during the course of the project or are moved from one project to another before the formal project handover process is completed. As a result, a new project manager is placed in a project without prior knowledge of the intricate details of the project, which become riskier from a contract management perspective. In such cases, the new project manager inherits some of the contract issues without historical knowledge relating to these issues and the management of contracts becomes challenging, usually with financial implications to the projects (Eskom, 2014b:3).

This is a typical example of the costly mistakes that may result if KM processes are not embedded within the project environment. It should, however, be realised that the situation is not unique to this particular SAPU’s project environment. Knowledge generated during project execution is usually lost across organisations when projects are closed out or project members move to other projects. Project team members may be reassigned to other projects before the project formally closes out; it is for this reason that project close out procedures or formal hand overs are recommended before members are moved out of any project (Tükel et al., 2008:180).

It has been established that KM is a facilitator towards project efficiency and it is evident that effective KS cannot be achieved if projects are operating in silos. The rationale behind project efficiency is to ensure that mistakes are not repeated within current and future projects to avoid budget overruns, delays and fatalities. The issue of project efficiency therefore calls for formalised or rather matured KS practices within and between projects. Having established that KS practices occur informally and formally within the boundaries of project teams, it is important to take into account that the non-formalised nature of KS practices makes it difficult to ensure that the knowledge is captured and shared across projects. According to Tükel et al. (2008:180), different projects typically have similar tasks or scopes as they are repeatedly being implemented within the organisation, therefore effective transfer of knowledge between similar projects will have a positive impact on the successor projects. The ultimate results are
likely to be improved project performance as a result of learning from previous projects. The formalisation of these KS practices will play an integral role in enhancing IC within the SAPU’s project environment.

According to Shih, Chang and Lin (2010:75) the value proposition of effective KM in organisations resides within its capacity to ensure that IC is continuously being captured, utilised and re-utilised to the benefit of the organisation. IC is composed of the organisation’s core intangible assets such as human intelligence, wisdom, experiences, business relationship and expertise (Subramaniam & Youndt, 2005:451). However, the unfortunate part is that a large amount of such resources, reside within people and it is lost when they leave organisations (Wang, Wang & Liang, 2014:233). This describes the current dilemma at the SAPU, when taking into consideration the situation that the organisation finds itself in. The SAPU relies heavily on consultants in the execution of its projects, and the IC is continuously lost when they leave the organisation after a project has been completed.

The current reality within the SAPU is that expatriate consultants and contractors from international companies are typically utilised in construction projects to provide the skills and expertise that are either limited or not available locally. In such instances, the approach presents an opportunity for the host country to learn and acquire both knowledge and skills in order to better execute future projects. However it does not always bear the much expected positive results. Certain challenges such as willingness, communication barriers, cultural differences and trust often hinder the learning process and the host country does not learn as was expected (Dulaimi, 2007:551). In the context of the SAPU, skills and knowledge transfer (SKT) clauses form part of most contracts in order to ensure commitment from the consultants and contractors to bridge the skills gap in certain specialised areas within the organisation and the country. The effectiveness of such clauses in ensuring that knowledge and skills transfers take place as expected, is still questionable as KS challenges are continuing despite such clauses.

In a survey conducted by ManpowerGroup, it was found that the talent shortage in South Africa has increased between 2014 and 2015, especially in skilled technical areas
in which technicians, engineers and trade workers function (ManpowerGroup, 2015:6). According to research conducted by Ravu and Parker (2015:334) within one of the SAPU's largest construction projects, expatriates within the project were not open to share knowledge and empower local project team members, which contributed to the loss of IC by the SAPU. In order for the organisation to effectively exploit its IC, good relationships need to be established with business partners such as contractors, customers, competitors and any other stakeholders (Seleim & Khalil, 2011:591). This is not currently the case within the SAPU and the issue aggravates the loss of IC due to poor KS which impacts negatively on organisational learning.

One of the SAPU's goals is to become a learning organisation (LO). The term LO is often linked to the work of Peter Senge. According to Senge (1990), "LOs are organisations where people are continually expanding their capacity to create the results they desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free and where people are continually willing to see the whole together". He also emphasises that the rationale behind an LO is that in times of uncertainty and turbulence, only the most flexible organisations that are adaptable to change, will compete and survive in a hypercompetitive environment. When taking into account the current situation of the SAPU, it is justifiable that a transition towards becoming an LO is indeed required. In becoming an LO, the organisation would be able to adapt to the changing business environment by continuously leveraging on its IC. In order for the organisation to become an LO, it should be able to leverage on the building blocks of an LO which are learning through experience and learning from the experiences of others (Tukel et al., 2008:180). It is therefore crucial that the SAPU takes into cognisance the importance of leveraging its own experiences and those of other organisations if its goal is to become an LO.

In this context, it has become imperative to investigate how effective KS practices can contribute towards enhancing the existing IC within the SAPU's project environment. To this effect, it is necessary to investigate possible strategies that can be utilised to overcome KS challenges as well as their possible implications. Development and enhancement of IC is critical for the SAPU to survive, since the rapid competitive
environment and economic growth calls for more efficient ways of energy supply in South Africa. This implies that the organisation might be required to continuously expand its electricity generating capacity by building more plants in the future, hence the paramount importance of preserving and enhancing its IC.

Although the SAPU does not have a direct competitor within South Africa, it must be noted that there is indirect competition for resources such as coal and skilled human resources from different industries. The potential of new entrants in the electricity industry, especially in the green energy environment is another form of indirect competition that might face the SAPU. The KM function within the SAPU is continuously looking for ways to encourage KS and suppress a knowledge hoarding culture as a way of enhancing IC to enable a sustainable competitive advantage for the SAPU; therefore the focus of this study which is to understand the role of KS in enhancing IC within the organisation’s project environment is relevant and can be valuable to the organisation.

Garon (2006:104) emphasises the importance of KM within the project environment by highlighting the significant role of KS and reapplying knowledge throughout the project life cycle in terms of stimulating problem solving. Although different studies have been conducted on KM and KS within the project environment (Ma, Qi & Wang, 2008:102; Mueller, 2012:441 and Nesheim & Smith, 2015:262), especially in developed countries, the findings of such studies cannot be conclusively applied to the South African context, or to the SAPU for that matter due to cultural, socioeconomic and environmental differences. This study therefore investigates the role of KS as a facilitator of IC within the specific project environment of the SAPU.

1.2. Problem statement
KS poses challenges which hamper the development of IC within the SAPU’s project environment. For this reason, it is deemed necessary to investigate the underlying factors that hinder the growth of IC through KS and to propose possible solutions to the problem.
1.3. Aim:
To investigate possible ways of enhancing IC through KS within the SAPU's project environment.

1.4. Objectives:
- To understand the perceptions of project managers towards KS as a means of enhancing IC.
- To identify possible strategies that can be utilised to enhance KS among project managers to enhance IC within the SAPU project environment.
- To determine the implications of understanding the perceptions of project managers towards KS as a means of enhancing IC.
- To determine the implications of applying strategies aimed at enhancing KS among project managers as a way of enhancing IC within the SAPU project environment.

1.5. Research question
What are the effective KS practices that contribute towards the enhancement of IC within the SAPU's project environment?

1.5.1. Sub-questions
- What are the perceptions of project managers towards KS in general and as a means of enhancing IC?
- What are the KS barriers within the SAPU's project environment?
- What are the possible strategies that can be utilised to enhance KS practices within the SAPU's project environment?
- What are the perceived implications of implementing the identified strategies towards the enhancement of IC, within the SAPU's project environment?

1.6. General indication of research design and methodology
The research design is composed of the philosophical paradigm, research approach, methodological choices and research strategy which were the principal foundations of
this research. In terms of the research paradigm, this research utilises the phenomenological research paradigm. Individuals’ opinions, views, perceptions, interpretations and understandings will be tested. The philosophical paradigm in the context of this research will be aligned within the research approach which is based on an inductive research approach. The test of perceptions, opinions and individual views will also be linked to a qualitative research design which will be the case in this research as a mono-qualitative method is utilised. A case study research strategy will be utilised within the context of this research, while the time horizon will be cross sectional due to time constraints attached to this research. Purposive sampling will be used to streamline the scope of the research, and is complemented by interviews as the research data collection method.

1.7. Chapter outline
The first chapter in this research will introduce and justify the topic in the form of introduction and background as well as the rationale. This chapter will also put the topic into perspective by highlighting how the topic is relevant to the organisation in question including the value proposition of this research. To set the tone and direction for this research, the research problem, aims and objectives will also form part of the first chapter within this research.

The second chapter will offer perspective by providing a literature review which will consist of key components relevant to the research. These include the integration between KM and PM, the value thereof as well as the role of KS in the enhancement of IC within the organisation’s project environment. The challenges associated with KS in the project environment as well as the proposed solutions will also form an integral part of this chapter.

The research will proceed by discussing the research design that was utilised in conducting this research in chapter three; this chapter will include the ethics that were observed and the limitations to this research. Chapter four of this report will reflect on
the research findings and discussion followed by recommendations and a conclusion in chapter 5.

1.8. Conclusion
The changing business environment perpetuated by factors such as globalisation affects every organisation irrespective of the industry or the country. This has implications for organisations such as the SAPU and therefore calls for the streamlining of the organisation's operations to continuously adapt to the changing environment and unpredictable customer demands. From this perspective, embarking on projects to continuously expand or enhance the power generating capacity to cater for the expanding customer base with limited resources, remains critical for the SAPU.

It therefore becomes crucial for the organisation to execute its projects as efficiently and effectively as possible, to avoid the unnecessary loss of money, time and most importantly, human lives. In order for the organisation to achieve this goal, preservation of knowledge is critical. Knowledge can be preserved through the implementation of KM processes such as KS, which are people centred. By continuously sharing knowledge within and between the projects, the SAPU would be able to build and enhance its IC. It can therefore be concluded that recognising the importance of KS in the effective execution of projects, has potential positive implications for organisations such as the SAPU and it must continue to preserve and re-utilise its knowledge if it is to achieve a high level of project efficiency by avoiding repetition of mistakes and minimisation of risks, while building different layers of intellectual capabilities. The literature review is contained in the next section.
CHAPTER 2

LITERATURE REVIEW

2.1. Introduction
Different scholars have researched KM in the modern business environment, including how the application of knowledge as a strategic resource affects organisations operating in this constantly changing business environment of the 21\textsuperscript{st} century. This section gives context to this study by discussing the role of KM in the modern business environment and deliberating on KM within the South African context. The research continues by highlighting the relationship between KM, IC and KS with specific reference to the project environment. The role of KS and IC in opening up the organisation’s competitive edge, including the benefits of becoming a LO, are deliberated on. In order to further give context to the project environment, the SAPU's project environment is discussed. KM challenges within the SAPU, as well as possible strategies that can be applied to overcome these challenges specifically within the project environment are also discussed, followed by concluding remarks.

2.2. The role of KM in the modern business environment
KM has become one of the key strategic areas for organisations operating in the hypercompetitive business environment of the 21\textsuperscript{st} century (Kannabiran & Pandyan, 2010:335). Francis Bacon wrote that "knowledge is power" (Barclay, 2000) and John F. Kennedy, while he was addressing the Nobel Prize winners in the White House of the United States of America on 29 April 1962, stated that, "in a time of turbulence and change, it is truer than ever that knowledge is power." Although the value of knowledge cannot be quantified and easily managed due to its intangible nature, knowledge is a strategically invaluable resource (Halawi, McCarthy & Aronson, 2006:384).
The role of knowledge as a strategic resource within the organisation has surpassed some of the traditional resources such as labour, finance and natural resources since knowledge is inseparable from and required in the exploitation of those resources for value creation (Kang, 2007:126). While acknowledging the invaluable role of knowledge in the modern business environment, countries such as South Africa are facing a serious threat due to the loss and potential loss of knowledge. According to Whyte and Classen (2012:951), "people born during the 1939-1945 post war era, known as the baby-boomers, are retiring" in organisations and are leaving a huge knowledge gap, not only within specific organisations, but also the countries these organisations function within. As a result of these retirements, many organisations are losing their subject matter experts with great deals of experience and valuable knowledge. Within this context, KM has an integral role to play in ensuring that different strategies are applied to ensure that knowledge is shared and preserved within the organisations to prevent such losses. In order for organisations of the 21st century to overcome this loss of knowledge, KS as the process of KM would play an integral part (Burke, 2011:6).

According to Wang et al. (2014:231), knowledge within the organisation is by nature usually never sufficiently distributed. Among the organisation’s stakeholders, KS is regarded as a critical part of ensuring that IC is accumulated. Through the accumulation of IC, the organisation’s capacity is improved with the potential benefit of improving organisational performance (Wang, Liang, Zhong, Xue & Xiao, 2012:326). South Africa, like many other countries, has also started implementing KM practices across different industries in order to preserve and leverage their knowledge for gaining a competitive advantage. The following section discusses KM within the South African context.

2.3. KM in the South African context

The beginning of KM in the South African public sector is linked to the emergence of the new public management (NPM) concept according to Mphahlele (2010:9). The NPM approach was inherited from developed countries by South African government departments and other institutions as a means of facilitating effective and efficient service delivery. NPM is deemed to have laid the grounds for the development of KM in
developing countries such South Africa (Cong & Padya, 2003:28). It is speculated that as a result of the collaboration between the private and the public sector through public-private partnerships, KM in the public sector might have been introduced within almost the same time period as in the private sector (Mphahlele, 2010:9).

According to the research conducted by Kruger and Johnson (2010:543) on the maturity of KM principles implementation in South African industries, 49% of the 9 industries (automobile/transportation, Banks and insurance, chemicals/pharmaceuticals, Construction, building materials to mining, Consulting, auditing, to service delivery, Consumer goods to utilities, Education, Government and IT to telecommunications) show a great maturity in their KM initiatives. Over 60% of the 9 industries show great strides in the utilisation of information and communications technology (ICT) and information management (IM) as the enablers towards the successful implementation of KM. One of the interesting findings from Kruger and Johnson’s research was that over 50% of the sampled industries are able to identify KM principles, policies, issues and strategies; 46% of these industries could show that such strategies, principles and policies are unlikely to result in successful KM initiatives that bear the expected results.

Although the above findings cannot be utilised as a conclusive view of the South African KM maturity due to its industry focus and also taking into account the five year gap from the time of the research, it gives clues in terms of the KM journey within the South African context. According to Mannie, Van Niekerk and Adendorff (2013:1), KM has progressed significantly in the private sector of developed countries over the years, however, little has been achieved in the public sector. In contrast, developing countries such as South Africa have not shown much success in KM, especially in the sharing of knowledge, both within the public and the private sector due to silo operations in the execution of their tasks.
2.4. IC, KM and KS in a project environment

2.4.1. Research context and definition of concepts

According to PMI (2013:3), a project is a "temporary endeavour undertaken to create a unique product, service, or result. The temporary nature of projects indicates that a project has a definite beginning and end. The end is reached when the project’s objectives have been achieved or when the project is terminated because its objectives will not or cannot be met, or when the need for the project no longer exists". Jafari et al. (2011:310) also support the PMI definition by defining projects as "unique and impermanent activities with altering manpower that are usually short term". The PMI (2013:3) further defines PM as "the application of knowledge, skills, tools and techniques to project activities to meet the project requirements". In the context of this research, a project is defined as a temporary endeavour to coordinate resources in order to accomplish a specific goal while also creating valuable organisational resources such as IC.

Having discussed the importance of preserving IC within the organisation in the previous sections, this section defines IC and other related concepts that are typically used interchangeably in the literature as well as clarifying the position of this research with regard to such concepts. Concepts such as organisational memory, institutional memory, corporate memory, intellectual capital assets, intellectual assets, intangible assets and knowledge assets are typically used interchangeably by authors in the literature to refer to intellectual capital (Housel & Nelson, 2005:545). In the context of this research, the focus is directly on IC and the above listed concepts will not be used interchangeably.

There is no consensus among authors on the definition of IC currently, however, there are commonalities in the definitions by different authors. These commonalities are based on the widely accepted premise that IC is composed of "intangible organisational assets which include human capital, relational capital, structural and organisational capital" (Balouei & Ghasemian, 2014:3). In the coordination and management of project resources, which include the above mentioned forms of IC, the project creates IC which is deemed critical for the continuous successes of the projects within the organisation.
Having established the lack of consensus on the definition of IC, this section will elaborate on different definitions of IC in the literature. Many authors define IC as the "valuable, intangible and inimitable resource for value creation" (Roos, Pike & Fernström, 2005:1; Johannessen, Olsen & Olaisen, 2005:152; Marr, Schiuma & Neely, 2004:314). Peng, Pike and Roos (2007:539) define IC as a set of organisational resources utilised to generate economic value. According to Edvinsson, Hoffman-Bang and Jacobsen (2005:135), IC refers to "all factors critical to an organisation's future success and it is not reflected in the traditional balance sheet". The most important element that seems to be a consensus among different authors on the concept of IC is the invaluable role of IC in terms of improving organisational performance and gaining a competitive advantage (Cuganesan, 2005:358).

According to the research conducted by Sullivan (1999:133), some companies relied heavily on the human capital element and defined IC as "what walks out of the door at the end of the business day". Such human capital focused definitions maintain that the organisation's knowledge resides within the heads of employees and warn that "by law employees have the right to move to any other company". Within this context, it is stressed that organisations should learn how to preserve the knowledge that resides within their employees through the utilisation of KM practices if they are to benefit from their IC (Adrian, 2008: 245).

For the sake of this research, IC is defined as the "summation of all knowledge and capabilities of every employee that brings about performance and creates wealth for the enterprise". It is categorised into human, structural and relational capital (Huang & Hsueh, 2007:256). The focus of this research will be on human capital since KS is people centred and human capital is regarded as a strategic resource for enabling sustainable competitive advantage in the ever changing hypercompetitive business environment (Bontis, Seleim & Ashour, 2007:790).

The ability of organisations to become innovative in product development, improved project execution, improved productivity while also increasing their level of efficiency
depends highly on leveraging its human capital (Ngah & Ibrahim, 2011:2), hence the focus of this study. Human Capital is defined as dimensions of knowledge which are utilised and owned by different individuals within the organisation (Radaeilli, Mura, Spiller & Lettieri, 2011:344). Wang et al. (2014:231) also define human capital as the "sum of employees' embedded competence, knowledge, skills, innovativeness, attitude, commitment, wisdom and experience". This definition forms the basis of how IC was viewed during this study and emphasises the importance of implementing KM processes such as KS to enhance IC within the organisation.

Defining the concept of KM is not simple, as different authors and research often define the term within a specific context. For the context of this study, a definition for KM will be based on KM within the project environment. To this end, Hill (2014:109) defines KM as "coordinating organisational knowledge and information to enable increased PM capability and to achieve business value from that capacity". This definition emphasises the paramount importance of communication within the project in terms of data transfer and its conversion into information and subsequently into knowledge. Simon (2009:2) further supports this definition by stipulating that KM entails the transformation of project communication into a valuable organisational resource. The knowledge can be utilised for driving efficiency and continuous improvement within the organisation. In order for KM to be effective within the organisation, processes such as KS should take place.

KS is a critical process in the transfer of tacit knowledge from an individual to another (Amaya, 2013:454). Tacit knowledge is defined as the knowledge residing within the minds or heads of individuals and it is difficult to document, while explicit knowledge is codified, easy to access and expressed explicitly (Nonaka & Takeuchi, 1995:8). KS refers to the process of providing task related knowledge by collaborating with others in order to solve problems, develop new ideas and contribute towards progress (Wang & Noe, 2010:117). Lilleoere and Hansen (2011:54) support this definition by simply defining KS as a process of exchanging knowledge between people. The above discussion has indicated that there is an interdependent relationship between KS as the KM process that facilitates the development and enhancement of IC. The relationship between KM, KS and IC is elaborated on in the next section.
2.4.2. The relationship between IC, KM and KS

Establishing the link between IC, KM and KS is critical as this forms the main focus of this study. KM is the process that assists organisations in the management and preservation of knowledge while the applied and preserved knowledge stocks form the IC within the organisation (Youndt, Subramaniam & Snell, 2004:336). According to Akhavan, Hosnavi and Sanjaghi (2009:99), KM is defined as the process of "identifying, optimising and active management of the organisation's intellectual assets" for value creation while increasing the competitive edge. This description elucidates the relationship between KM and IC by defining KM as a process implemented in the exploitation of IC as an invaluable organisational resource. KS is one of the integral processes in KM since it enables the flow of knowledge from one individual to the other, thereby establishing a collective know-how within the organisation (Ngah & Ibrahim, 2011:1). Having established the importance of the KS process as an enabler towards knowledge flow within the organisation, it is also worth noting that the success of this process depends highly on people (Subramaniam & Youndt, 2005:454), as it is within their skills and expertise that IC resides.

The ability of the organisation to effectively manage its IC as a routine process is regarded as one of the success factors of any KM programme within an organisation (Earl, 2001:216). KM is regarded as the process that enables the creation and enhancement of the organisation's knowledge known as IC and an organisation cannot accumulate IC without the utilisation of KM processes such as KS (Wang et al., 2014:234). KM and IC are also vital components for organisational competitiveness, especially in the hypercompetitive business environment. However, none of these components can be pursued independently (Seleim & Khalil, 2011:587). Shih et al. (2010:75) emphasise that KM and IC have a great deal of influence on each other and such influence is instrumental to the improvement of organisational effectiveness. Figure 1 below illustrates the underlying relationship and dependencies between knowledge, KM processes and the creation of IC.
Figure 1 below shows the relationship between KM, KS and IC at the organisational level by giving reference to the focus of this study, which is the enhancement of IC within the project environment through the use of the KS process. The figure shows the relationship between KM and IC by illustrating the reciprocal dependency between IC and KM, with KS as the conduit in this process. Hsu and Sabherwal (2012:493) emphasise the reciprocal nature of the relationship between KM and IC by indicating that there is a mutual dependency between organisational resources such as IC and processes. They acknowledge that this two way relationship between KM and IC is rooted within the knowledge based view (KBV) of an organisation.

**Figure 1** KM, KS and IC within projects


The concept of a KBV originated from the resource based view (RBV) of an organisation, which is based on two principles: one being that organisational resources are fundamental to the formation of "information-based, tangible and intangible processes" while the same processes are utilised to enhance organisational resources such as IC (Bogner & Bansal, 2007:166). The KBV also emphasises that intangible resources such as IC within the organisation have more potential of enabling highly
sustainable performance within the organisation than resources such as finance, natural resources and others (Halawi et al., 2006:384).

Figure 1 is based on the assumption that in the beginning the organisation has a specific level of IC embedded within its employees. This IC is shared through KM processes such as KS and as it is being shared, improvements are made to the organisational processes as a result of innovative problem solving and exploitation of new opportunities; the IC of the organisation is therefore enhanced (Seleim & Khalil, 2011:587). New IC is also acquired as the organisation evolves and adopts new processes, skills, competencies and is confronted by different challenges. As the organisation acquires new IC, its existing IC is enhanced as different layers of intellectual capabilities are created (Hsu & Sabherwal, 2012:493). The creation of new IC follows the information life cycle from data to knowledge and finally becomes the valuable IC within the organisation or within the project, as is the case in the focus of this research.

According to Radaelli et al. (2011:344), consistent development of the organisation's knowledge base depends on the individual's ability to utilise the existing knowledge to its full potential while at the same time advancing such knowledge through the processes of combination and contextualisation. The continuous sharing of knowledge between individuals within the organisation is therefore a critical practice for enhancing the IC. Marr, Gupta, Pike and Roos (2003:771) state that for the organisation to be successful in terms of managing its intangible strategic resource such as IC, KM should serve as the backbone towards achieving this objective. KM processes are therefore deemed critical in ensuring that the IC of the organisation is well managed and enhanced.

The role of KS in the enhancement of IC within the organisation, especially human capital, is crucial. KS is regarded as a means towards the enhancement of organisational knowledge resources such as IC, while also elevating the performance of the organisation (Wang et al., 2014:231). This is attributed to the fact that a knowledgeable organisation is well equipped to make better decisions and adapt to different circumstances. Furthermore, KS enables the organisation's workforce to work
smart as knowledge workers, through the sharing of best practices, LL and experiences. As knowledge is consistently being shared, processes are optimised and the organisation improves on its efficiencies. In the context of a project based organisation, KS can contribute immensely to the improvement of the PM capability within the organisation (Wang et al., 2012:326).

According to Seleim and Khalil (2011:591) the ultimate goal of KM through the utilisation of processes such as KS, is to ensure the effective accumulation, enhancement and exploitation of IC within the organisation. Organisations can effectively enhance their IC by creating an environment conducive to the flow of knowledge, through the use of KM processes such as KS (Shih et al., 2010:86). Effectively, an organisation such as the SAPU is able to execute its projects faster, better, cheaper and increase its competitive advantage through the implementation of a value adding KM programme.

2.4.3. KS, IC and competitive advantage

KM and IC are regarded as the most valuable resources that contribute immensely to the organisation's competitive edge by positively influencing the organisational performance (Hsu & Sabherwal, 2012:492). Therefore, organisations of the 21st century should exploit their IC through the utilisation of KM processes such as KS in order to overcome the continuously increasing challenges in the globalised business environment (Shih et al., 2010:86). According to Wang et al. (2014:327), effective utilisation of KS within an organisation can potentially result in the reduction of production cost, faster completion of projects, improvement of decision making, innovation as well as enhancing the intellectual capability. Wang et al. (2014:327) further highlight that KS plays an integral role in the creation of organisational expertise by enhancing performance, competitiveness and other intangible assets such as IC.

Radaeilli et al. (2011:344) also acknowledge the pivotal role that KS plays in positively influencing the performance of an organisation through the development and enhancement of human capital. Hill (2014:110) emphasises that a KM function within the PMO should enable the establishment of a "well-informed PM environment"
characterised by efficient operations and effective communication. In this kind of setting, the organisation responds intelligently to the changing environment and strives towards meeting customer requirements. Johannessen et al. (2005:152) argue that the increased uncertainty and dynamic knowledge requirements of the modern business environment has resulted in a meaningful recognition of the value of IC as a way of reacting to some of the challenges brought on by this unpredictability.

In a knowledge intensive environment characterised by intense competition, preservation of IC during construction projects is not only important in the successful execution of these projects, but also in maintaining the organisation's competitive advantage. The value of IC in the business environment has overtaken the value of physical resources as these are continuously consumed and lose value in the process. However, the value of IC becomes noticeable if it is well utilised (Huang & Hsueh, 2007:256). It is within this context that it becomes imperative for PBOs to utilise KS practices in order to enhance their IC.

According to Bontis et al. (2007:790), the world is consistently revolutionised through technological advancement, innovation and telecommunications. In order to survive this kind of knowledge intensive revolution, organisations need to acknowledge the invaluable role of IC as a source of competitive advantage. As competition continues to increase in the hyper-paced business environment, the IC of an organisation becomes its current and future competitive leverage and security, since this resource is not easily imitable (Halawi et al., 2006:386). This view is also supported by the resource-based school of thought which states that the most competitive resources within the organisation are internal, organisational specific and capabilities that cannot be easily copied and are unique to the organisation (Seleim & Khalil, 2011:587).

According to findings of research conducted by Andreeva and Kianto (2012:630) on whether KM matters within the organisation, it was discovered that KM contributes to the overall performance of an organisation by saving costs, reducing product development cycles and retaining and sustaining the organisation's IC. The KBV of an organisation also emphasises that the differentiating factors between organisations of the modern
competitive business environment is not their product market positioning, rather the way they utilise their IC (Halawi et al., 2006:386). It is evident from the above arguments, based on empirical research, that KM plays an integral role in elevating the organisation to a competitive edge through the effective management and enhancement of IC.

Seleim and Khalil (2007:38) emphasise that, where KM processes such as KS are utilised as a means of developing and enhancing IC within the organisation, a high level of sustainable competitive advantage can be achieved by the organisation. Wang et al. (2014:238) argue that KS combines different pieces of knowledge within the organisation and that this has a direct and positive influence on innovation and creativity, resulting in improved performance which in turn increases the competitiveness of the organisation. It is clear from the above discussions that the competitiveness of the organisation is highly dependent on its ability to continuously exploit its existing IC, while also learning to adapt to new circumstances, which highlight the importance of becoming an LO.

2.4.4. Benefits of being an LO

Change is constant in the globalised business environment and that brings about uncertainty and discomfort for organisations. The organisation that is flexible enough and always willing to learn stands a better chance of sustaining its competitive advantage and survive the cut-throat competitive business market (Kannabiran & Pandyan, 2010:335). For projects, an LO will benefit by learning from its own experiences as well as those of others, in order to better execute efficient projects (Thomas & Allan, 2006:124). An organisation that continuously learns is able to avoid repetition of pitfalls, anticipate problems and respond instantly to the emerging challenges (Wilson & Beard, 2014:99). PBOs are continuously executing projects either simultaneously or sequentially and transferring knowledge between projects for improved performance is among the principles of a LO.

Ensuring that knowledge is shared across projects as quickly and efficiently as possible, assists in improving the project execution phases, while also refining the planning of
future projects. Timely and informed decisions are also taken as a result of the available relevant information, thereby enabling projects to perform with minimal foreseeable challenges. An LO has a culture which encourages learning and mistakes are not always seen as problematic, but regarded as learning experiences. A learning culture such as this also assists the organisation to facilitate better collaboration between all stakeholders involved within the project. In that regard, creativity and innovation are encouraged and new approaches are regarded as experiments to improve and solving emerging organisational challenges, which can result in more effectively managed and executed projects (Retna & Jones, 2013:339).

An LO does not operate in isolation, it integrates different elements in its environment that have influence over or could potentially impact its operations in order to keep abreast of issues, anticipate and minimise risks as much as possible (Wilson & Beard, 2014:100). Improved organisational performance and sustainable competitiveness are some of the benefits of functioning as an LO, however, achieving such milestones depends heavily on the nature of the organisation, its priorities and objectives (Mishra & Bhaskar, 2011:435). The following section will reflect on the SAPU's project environment in order to contextualise this setting in terms of competitiveness and areas in need of improvement.

2.5. The SAPU's project environment
The SAPU defines PM as the "management of the project scope from project inception to delivery as per respective project life cycle model" (Eskom, 2013:6). To this particular SAPU, a project is a unique set of coordinated and controlled processes with a start and end date aimed at achieving an organisational objective. In order to achieve the organisational objectives through project execution, the deliverables should be aligned to triple constraints in the form of time, cost and scope (Eskom, 2011:4). In the execution of its projects, the SAPU is guided by a project life cycle model (PLCM) which governs the project work and manages approval and investment processes. The PLCM dictates different sets of requirements that should form part of a project throughout its various phases which include conceptualisation, definition, execution and finalisation.
There are five stage gates within the PLCM which serve as the control points for managing release of the required project funds and resources. The stage gates include concept release approval, definition release approval, execution release approval, handover approval and finalisation release approval (Eskom, 2012b:3). According to Tukel et al. (2008:193), most PBOs have stage-gating processes that guide selection of critical projects to be pursued. Project stages are used to develop a concept product further while gates are the decision points whereby the gatekeeper, usually the sponsor, decides on the way forward with the project. This process is also observed within the relevant SAPU.

Since PBOs such as the SAPU might execute projects simultaneously, and keeping in mind that the same projects have defined lifespans, the sharing of knowledge within and between projects becomes crucial. Garon (2006:104) indicates that the role of KS in ensuring the success of current and future projects within an organisation is critical and IC enhancement is vital to ensure that organisations such as the SAPU develop competitive PM competencies. Jugdev (2007:424) emphasises the importance of continuously evaluating an organisation’s investment in both tangible and intangible assets in the PM context, since this is imperative for building project capability, as it contributes to the competitive advantage of the organisation. The SAPU is not an exception in this regard. There is no universally agreed upon approach to the implementation of KM within the PM environment (Leseure & Brookes, 2004:104), however, there are some tools that seem to be favoured in this regard.

"LL interventions", also known as "Project reviews" or "Post mortems" in the PM environment are typically utilised as a means of KS between project team members. According to Garon (2006:104), LL plays an integral part throughout the project life cycle by eliciting solution oriented operations that assist in improving project performance. In the context of the relevant SAPU, LL interventions are the tools utilised as a way of facilitating KS within and between projects. It must, however, be noted that although LL are utilised within this SAPU, there are various challenges that result in the inefficiencies of the process, especially when dealing with cross-project LL interventions (Eskom,
Each project is fully focused on its deliverables and timelines, it therefore makes it difficult for the project teams to take time off the project and participate in LL interventions. According to Kaj and Pekka (2008:40), if project teams are operating independently within the organisation, it becomes difficult for them to share knowledge since each is more focused on its own targets.

According to a project management maturity assessment that was conducted specifically for a rail construction project in the SAPU by the PMCoE in March 2014, KM was rated at 2.33 out of a possible score of 5, KM was one of the lowest rated areas in terms of the project maturity within the SAPU's rail construction project. This highlights that there are definite challenges that are faced in terms of implementing KM effectively within the project environment of this organisation (Eskom, 2014c:3). The findings by the PMCoE support the argument made by Kaj and Pekka (2008:40) as they highlighted the challenge for project teams to consistently engage in KS sessions between the projects when tight project deadlines and potential competition between the projects exist.

2.6. KM challenges in a project environment
KM implementation and adoption is usually a challenging aspect in the project environment. In big projects, especially where there are continuous changes in the organisational environment and the constant movement and rotation of staff, formalised KM initiatives are necessary as the organisational changes affect the KM stability directly (Leseure & Brookes, 2004:105) - this is also the case in the SAPU's project environment.

2.6.1. The impermanent nature of projects
A project, by definition, is time and target based, usually with budget constraints. However, in order to ensure that knowledge is captured and documented effectively, time is required. In most cases, this implies that key stakeholders should abandon their project duties and focus on KS initiatives usually executed in a meeting format. In many instances, such time is not catered for or KM initiatives were never part of the project
definition and scope (Ajmal, Kekäle & Takala, 2009:340). As a result, the nature of the pressured project environment, due to time and budget constraints, becomes the barrier to KS interventions in the project environment. Simon (2009:3) also emphasises that the time factor is one of the key hindrances when considering the capturing and transferring of knowledge within the project environment.

According to Graham and Thomas (2008:115) the impermanent nature of the construction project and the project teams, results in a lack of continuity which leads to knowledge loss in the process. Shokri-Ghasabeh and Chileshe (2014:112) highlight that knowledge is typically never shared formally across the organisation to be utilised in future projects, as a result it is likely to be lost when project team members leave the organisation as it is only stored within their minds. The biggest challenge in this context is that the project team is usually pressed for time and there is no other opportunity to capture knowledge since the project is temporary.

With the above mentioned challenges, the KM function within the SAPU with specific focus on projects has been following some of the recommended approaches in implementing KM within the projects. These approaches include the 12-stage process which is recommended by Collinson and Parcell (2001). These steps include calling up a meeting, inviting relevant project stakeholders, appointing the KS sessions facilitator, revisiting the project deliverables and plan, identifying the successes to be replicated in the future, identifying the things that went wrong and their root causes, capturing all the knowledge acquired and developing an action plan. The utilisation of this process has had insufficient impact on improving project performance within the SAPU due to the unavailability of the project teams to participate in this kind of KS interventions as a result of high focus on project targets and deliverables.

The impermanent nature of the project creates contrary objectives between the project team’s short-term objective of completing the project within time, budget and scope while the organisation also aims at preserving organisational knowledge thereby enhancing IC during execution. In support of the above argument, Shokri-Ghasabeh and Chileshe (2014:112) state that many researchers have also found out that capturing of
knowledge within the construction projects is never prioritised as a result of the temporary lifespan of projects, the learning opportunity is lost. The above argument highlights the challenges faced in the initiatives to facilitate KS within the SAPU's project environment since the learning opportunity lost during project execution cannot be recovered. The situation is also perpetuated by the complexity of knowledge creation (KC) and sharing processes.

### 2.6.2. The nature of KC and KS processes

Nonaka and Takeuchi (1995) explain the KC process as the interaction between individuals as well as the interaction between tacit and explicit knowledge. They refer to this process as the "knowledge creation spiral". The SECI model, which was developed by Nonaka and Takeuchi (Nonaka, Toyama & Konno, 2008:8), clearly highlights the complexity of the KC and sharing processes within an organisation. The SECI model focuses on four dimensions of knowledge creation and transfer processes which are socialisation, externalisation, combinations and internalisation.

According to Chou (2005:455), there is a clear link between KC and KS processes. He expresses this link by also highlighting the complexity of the processes whereby three key elements are considerable if the processes of KC and KS are to take place effectively. These elements include an "individual's ability to absorb and share knowledge, organisational learning mechanisms as well as the ability to store and retrieve knowledge". Lilleoere and Hansen (2011:54) explain the KS process as being dependent upon set-up, beliefs and values as well as individual practices. It can therefore be deduced that KS is more personal in nature and it involves a number of personal dynamics that make the process even more complex.

KS requires willingness by individuals to interact with others and the environment and it is a critical part of KC. However, this process is also the most complex and often the most challenging process in KM (Wang et al., 2014:231). The complexity and difficulties of this process is often attributed to the diffusive nature of tacit knowledge. Individuals are usually not aware of what they really know until such time that they need to act and
only then, do they start realising how much they know about a specific task. KS is a voluntary process, unless formally governed and enforced, individuals can choose not to share (Amaya, 2013:454).

Lilleoere and Hansen (2011:54) state that tacit knowledge is typically the most difficult to transfer as a result of its "stickiness" to the human mind. Although the value of KS in enhancing IC within the organisation is recognised, the process of KS is perceived as being difficult and complex in nature, due to certain elements involved in the process such as the set-up of a place in which knowledge is to be shared, personal beliefs and values as well as the KS practices of people involved in the process. For project managers operating within different projects or within different areas of the project, the belief that knowledge is power and that it therefore provides a competitive edge over other project managers, is enough to derail the KC and KS process within the organisation. These challenges are also relevant to the SAPU's project environment, especially considering the different cultures that currently exist within the organisation which brings about diversified beliefs, values and practices.

2.6.3. Cultural barriers
Culture plays an integral role in determining the suitability of knowledge exchange between individuals within an organisation (Park, Ribière & Schulte, 2004:107). Culture is defined as the collective shared beliefs that define a particular group of people and differentiate them from others (Anantatmula, 2010:242). According to Koskinen, Pihlanto and Vanharanta (2003:287) tacit knowledge is a crucial part of a project, however, sharing knowledge happens within a specific, conducive environment. Trust is considered to be one of the most important cultural attributes that contribute towards KS or knowledge hoarding behaviours within an organisation or project environment (Al-Alawi, Al-Marzooqi & Mohammed, 2007:25). An assessment conducted by a consulting company, with specific focus on two prominent power stations currently under construction within the SAPU, also confirmed that lack of trust is one of the main hindrances to KS between these two identical projects.
Taking into account that there are two main competing contractors involved in the two projects, mistrust brought about by competition is enough to hinder the transparent transfer of knowledge between the two projects. Often the fear that the other contractor might utilise the knowledge shared by one contractor to outperform them, is strong enough to hinder openness thereby preventing KS from taking place (Eskom, 2014a:2). Kaj and Pekka (2008:40) indicate that PBOs are most likely to run with several interrelated projects simultaneously. This presents an opportunity for KS between the projects, however, if such projects are separate and independent, they might compete for resources, commitment, attention and status thereby hindering the KS between them.

The above mentioned situation might be the result of diversified cultures with different beliefs, norms and values as well as the fact that project teams do not know each other in most instances, they only meet at the project’s execution site. It takes time for people to develop a mutual level of trust and for individuals to be able to comfortably share information and knowledge with each other. Mueller (2012:441) defines this phenomenon as “high growth value” which hinders KS as the organisation employs a large number of people simultaneously and as a result, it will take longer for people to develop trust and share knowledge.

In the South African context, communication barriers which result from different communication preferences from different cultures strengthen the culture barriers to KS (Finestone & Snyman, 2005:132). Kruger and Johnson (2010:542) stipulate that the South African environment is faced with a challenge of amalgamating Western and African cultures which result in diversity, constant change and possibility of intolerance and conflicts from a KS perspective. For example, the Western culture might promote writing as a means of communication while African culture is based on verbal story telling as communication style, which then poses challenges when the two cultures are working within the same project environment. Adding onto the element of communication styles, language also features as an important attribute of culture.
According to the research conducted by Park et al. (2004:113), cultural organisational attributes such as sharing information freely and working closely with others or making friends as indicated on the organisational culture profile, are some of the stepping stones towards a successful KM program and its efficiency. For people to share information, interact and make friends there needs to be a certain level of understanding facilitated by shared language. Finestone and Snyman (2005:132) emphasise the significant role that language barriers play in hindering KS process. In the context of the SAPU, there are vast amounts of languages from across the world at play in the project environment. According to findings of a study by Ravu and Parker (2015:335), communication styles and language differences were among some of the KS hindrances within the SAPU's construction projects.

Findings from a study conducted by Suppiah and Sandhu (2011:472) indicate that market and hierarchical organisational culture styles are not conducive to sharing of knowledge, especially tacit knowledge. In a market culture, focus is devoted to business transactions which create a competitive environment among the employees within the organisation. Knowledge is viewed as a competitive edge over colleagues and sharing is not encouraged. Similarly, a hierarchical organisational culture supported by commanding leadership styles is generational and level sensitive and junior staff cannot easily interact with seniors. The chain of command is highly important and KS does not thrive in such an environment. There are high controls with regard to who can communicate what kind of information to whom and how, which create bottlenecks in knowledge flow (Shao, Feng & Liu, 2012:2403). According to Mueller (2012:439), an open communication style coupled with approachable, non-hierarchical and participatory leadership are key culture components of a suitable KS environment. By virtue of being a state-owned company, a bureaucratic structure and hierarchical culture is evident within the SAPU, hence the culture challenges for KS.

A culture that is conducive to effective KS is crucial if an organisation is to win the battle against knowledge hoarding (Radaeilli et al., 2011:348). Ensuring effective KS within the organisation is one of the greatest challenges faced by many organisations in the modern hypercompetitive business environment. In order to overcome these challenges,
a competent workforce capable of absorbing the shared tacit knowledge, combined with
a culture and leadership style that supports KS is a perquisite within the organisation. A
culture that supports KS, is a culture of collectivism that values the whole as opposed to
individual preferences. It is a culture that believes in the "one plus one equals three"
principle and wherein the organisation's interests, in this case its knowledge interests,
count before the individual's (Nielsen, 2006:60).

2.6.4. Perceptions of project members
Long serving employees within an organisation become aware of certain ways, tried and
tested within different projects, of dealing with problems within the organisation
throughout their careers. In research conducted by Maake and Laughton (2013:7) on
KM practices within the City of Johannesburg (CoJ) museums, it was discovered that
there was a link between the number of years an individual has been with the
organisation and the perceptions that individual had towards KM practices. The longer
an individual had worked within the organisation, the less positive the individual's
perception towards KM practices was: these individuals did not trust KS as a means of
enhancing IC, since they were typically of the opinion that knowledge can solely be
acquired through experience. KS interventions were also regarded as time consuming
and fruitless by these experienced individuals. Time is regarded as a valuable asset
within organisations and participation in KS interventions may be regarded as profit lost
since the time used in these interventions is not billed. As a result, individuals may have
the perception that KS interventions are a waste of their valuable time, which they might
have utilised more productively to meet their project targets (Forstenlechner & Lettice,
2007:825).

When KS interventions are conducted, knowledge is captured, packaged, stored and
rooted to the relevant stakeholders for actioning if required. This includes knowledge
gathered from project execution tasks in the form of LL, which should inform the
correction of a specific organisational process or procedure or even become a
requirement within the organisation for all projects (Eskom, 2009:9); but this is not
always the case. The challenge arises when such interventions do not bear the
expected results due to non-actioning of the recommended approaches by the relevant stakeholders and process owners. As a result, the project teams perceive KS interventions as data capturing exercises only which do not directly add value to their projects or address specific concerns (Eskom, 2014a:2).

According to Bhardwaj and Monin (2006:74), tacit knowledge plays an integral role in unleashing creativity and innovation for solving organisational challenges, hence the negative perceptions when such creative recommendations are captured and never implemented or enforced. Maqsood, Finegan and Walker (2006:81) argue that the construction industry is heuristic in nature and people rely heavily on their intuition from their experiences and knowledge is not shared across the board. Perceptions may hinder tacit KS if project team members are under the impression that they know enough to execute their tasks successfully, rendering the need to acquire knowledge from other projects or share their knowledge obsolete. Research has also revealed that individual perceptions may hamper KS since expatriates often tend to regard locals as unskilled or incompetent while locals also doubt the capabilities of the expatriates, compounding the challenge of sharing knowledge or accepting the knowledge that is shared (Ravu & Parker, 2015:335).

2.6.5. Physical proximity between projects
PBOs usually run multiple projects at the same time. This is also the case within the SAPU, where a number of projects are currently being executed. Projects often operate far apart from each other, which also results in projects operating in silos. Lilleoere and Hansen (2011:56) state that physical distance between the project team members have a negative impact on their ability to share knowledge. In this regard, Koskinen et al. (2003:288) also emphasise that physical proximity between the projects have unpleasant outcomes from the tacit knowledge transfer perspective. Kang (2007:127) supports the above argument by indicating that sometimes projects are separated from each other within the organisation and as a result, the sharing of tacit knowledge between the project team members becomes a challenging factor. This can also be attributed to the fact that trustworthy relationships are easily established when project
team members continuously interact face-to-face, which cultivates a feeling of belonging and shared common problems (Wang et al., 2014:231).

According to Borgatti and Cross (2003:433) common identity plays a vital role in facilitating KS between different individuals. This identity can be in the form of a sense of belonging to a group, a team or project as they tend to understand each other better and often share common practices and technical language. It can therefore be deduced that the separation between the projects has a negative implication for tacit KS. This is true when one considers the SAPU's current projects. The two biggest projects are more than 300km apart and are run independently from each other. McLaughlin, Paton and Macbeth (2008:110) further support this argument by stating that the larger the physical and social distance between individuals, the harder it becomes to share tacit knowledge.

2.7. Strategies to overcome KS barriers in projects
Having discussed some of the challenges faced in KS as an integral process of KM within a project environment, it is important to focus on strategies that can be utilised in order to overcome these challenges. Different strategies as ways of addressing some of the KS challenges within organisations, have been proposed in the literature. The strategies that are usually applied in the effort of promoting KS have both positive and negative implications. KM integration into organisational processes, enforced governance and rewards and recognition systems are among the strategies that are being highlighted as means of promoting KS (Nakano, Munis & Batista, 2013:295). These strategies are not guaranteed to be successful, but are worth exploring as strategies to encourage KS.

2.7.1. Embedding KM into the PLCM
Having established that a PLCM governs the management and approval of the SAPU's projects, it would be ideal to ensure that KM practices become one of the requirements for project approval. This may include assigning resources and allocating time for KM interventions within the project schedule. In this regard, a project will be bound to implement KM practices, processes, methodologies, frameworks and systems within its
operations. Embedding KM into the PLCM will enable effective implementation and adoption of KM into the project processes of an organisation (Eskom, 2010b:7). However, caution should be exercised in the process of embedding KM in the PLCM.

According to Davenport and Glaser (2002:7) embedding KM into organisational processes is time consuming and costly, it is therefore important that KM is only embedded into the most critical processes. Within the SAPU, several efforts have been made to embed KM within the PLCM without any success (KM strategy, 2010:7). In this regard, formalisation of KM practices by embedding them into the PLCM would imply assigning time for KS practices within the project timeline and that KM is catered for from project definition to execution to ensure easy transition. Within the SAPU, a number of KM value proposition initiatives are being presented to the project sponsors in order to ensure that the objective of embedding KM can be achieved. It must be noted that this method is a forced approach, which is usually not ideal. However, this is considered a suitable approach for bureaucratic organisations which are structured and process oriented (Schroeder & Pauleen, 2007:425).

2.7.2. Rewards and recognition systems
Research conducted by Leseure and Brookes (2004:106) revealed a link between KM initiatives and rewards systems. In many instances, individuals put more effort in the execution of their tasks if they know they will be rewarded for their effort. KS sessions in the project environment, usually in the form of LL interventions, require the project teams to take time off from their daily duties and to put extra effort into participating in the interventions. Insufficient incentives or rewards to partake in KS initiatives have a negative impact on organisational KS initiatives, as noted in social exchange theory. Social exchange theory indicates that by nature, knowledge sharers have an expectation to be rewarded either through recognition, incentives, upgrading of their status or increased respect (Radaelli et al., 2011:344). However, even in instances where incentives systems were in place, the initiatives were perceived as being unproductive due to the amount of time spent in the KS interventions, in comparison to the rewards received (Ho & Kuo, 2013:1051).
LL interventions are the commonly utilised methods of capturing knowledge within the project environment. LL are typically utilised to reflect back on performance, based on what was planned against what has been achieved in order to identify gaps, improve on them and identify successes to continuously replicate them (Tukel et al., 2008:193). Since the amount of time utilised in LL sessions is not motivated through any form of incentive or compensation, it is deemed as one of the hindrances to KS. Nan (2008:101) notes that a lack of sufficient rewards systems hampers KS within many organisations. In instances where rewards and recognition systems such as incentive are in place, they often fail in addressing people’s knowledge hoarding behaviours (Wang et al., 2014:231).

The success of rewards and recognition systems in motivating employees to share their knowledge remains questionable. In the absence of any other driver for KS within the organisation, rewards and recognition systems such as incentives are not sufficient to promote KS (Iyer & Ravindran, 2009:412). Contrary to Iyer and Ravindran's view on the role of rewards systems, Tukel et al. (2008:180) emphasise the importance of an incentive mechanism as a means of ensuring the effectiveness of a learning process which is essential for knowledge transfer within the organisation. Lilleoere and Hansen (2011:54) also support the integral role of an effective rewards and recognition system by stating that KS is a complex process and is voluntary in nature, however, individuals typically share their knowledge with the expectation of receiving something in return, no matter the kind of reward. The premise of rewarding employees for sharing their knowledge calls for different types of rewards and recognition systems, rather than solely relying on one incentive mechanism to cater for the expectations of all individuals.

At times, individuals share their knowledge for the mere purpose of assisting to solve organisational challenges and implementation of such solutions gives them the level of satisfaction which can also be regarded as an incentive, as can simply recognising them by publishing their names on the organisation's intranet for their effort. According to Chang, Yeh and Yeh (2007:278) incentives are important mechanisms of encouraging individuals to share their knowledge by motivating their willingness. It can therefore be
deduced that, although it is acknowledged that there are different views on the role of rewards and recognition systems in encouraging KS, many authors agree that incentives is one of the strategies that can assist in triggering the interest of individuals to share their knowledge.

2.7.3. Enforced KM governance
The term governance is used differently according to various perspectives. For the sake of this research, governance refers to the implementation of an authority-based framework in order to channel the organisation towards the achievement of specific goals and objectives (Zyngier & Burstein, 2006:2). One of the strategies utilised to ensure that KM practices are embedded in the organisational processes is enforcing KM through governance such as policy, contracts, service level agreements and other means. According to Kannabiran and Pandyan (2010:336), KM governance refers to processes, procedures, policies and structures that are used to control, enforce and regulate KM practices within the organisation.

Zyngier and Burstein (2006:4) argue that, in order for an organisation's KM strategy to be successfully implemented, KM governance should be pursued as part of the KM strategy. One might therefore argue that the enforcement of KM governance becomes a prerequisite for successful KM implementation, especially within bureaucratic organisations such as the SAPU. However, enforced KM governance creates its own challenges within an organisation. According to Hernández-Espallardo, Rodríguez-Orejuela and Sánchez-Pérez (2010:105) KS depends heavily on the establishment of trust between the two parties involved and stringent governance usually has a negative impact on these relationships, as parties involved feel obliged to perform rather than motivated to participate.

Having established that KS is a voluntary process which involves the human mind, over which an organisation does not have control, it becomes clear that enforced governance can have negative implications. Individuals can either choose to hoard their knowledge or share what is not relevant or critical (Schroeder & Pauleen, 2007:415). In the
research conducted by Leseure and Brookes (2004:106), it was discovered that formalising KM practices through strategies such as enforced governance within the organisation can have negative implications on the process and over-management of the KM process can render the initiatives bureaucratic and therefore becomes counterproductive (Peltokorpi & Tsuyuki, 2007:123).

Bhardwaj and Monin (2006:74) also support this argument by stating that the creation and sharing of knowledge is complex in nature and cannot be supervised or forced, it can only happen when individuals volunteer. In contradiction, Schroeder and Pauleen (2007:425) found out that the creation and enforcement of KM governance may have positive results towards embedding KM practices within the organisation. It can, however, be deduced that there are different views on the role of enforced governance as a means of promoting KS. The success of this strategy depends heavily on the organisation’s structure and culture, in the context of bureaucratic, hierarchical, governance and process driven organisations such as the SAPU, enforced governance can bear positive outcomes and it is therefore recommended.

2.8. Conclusion
In the constantly changing business environment, a culture of "survival of the fittest" where the weakest links are eliminated, is expected. In such an environment, owning differentiating and difficult-to-imitate resources, becomes vital. In such an environment, the role of knowledge which is accumulated to build and enhance IC within the organisation, cannot go unnoticed. KM through processes such as KS, is instrumental in remaining competitive, however, this process is often thwarted by massive challenges, especially in the project environment. Knowledge remains an invaluable strategic resource within an organisation and a project environment, however management of this resource as well as its exploitation to derive value vital for sustaining a competitive edge is a challenging task. It is recommended that different strategies, such as rewards and enforced governance, be implemented to attempt overcoming these challenges that hinder effective KS. In the following section, the research methodology and design that were applied within this study are discussed.
3.1. Introduction
Research is a structured investigative process, guided by specific methods and techniques with the aim of revealing facts on the matter at hand. In order to ensure that research results are valid, objective research methods and procedures which are deemed unbiased are used, as is the case within the context of this study (Mouton, 2009:35). This section discusses the research design and methods implemented throughout the study and deals with the research paradigms, strategy, approach as well as time horizon, sampling, data collection and analysis, ethics and limitations to the study.

3.2. Research Design
The research design is composed of the philosophical paradigm, research paradigm and research design types. Each of these components will be discussed below.

3.2.1. Philosophical paradigm
In terms of the philosophical paradigm, this study is based on the phenomenological paradigm which has its roots in the interpretivism philosophy. The researcher was part of the research and had influence especially in the data collection process since face-to-face interviews were conducted. According to Saunders, Lewis & Thornhill (2009:116), interpretivism is applicable in instances where the research is aimed at understanding the world from the social actor’s point of view. This was the case in this study and its methods since the interviews were utilised as a tool to gather data for interpreting the project managers' views in order to understand the reality in their world on the topic at hand.
Lester (1999:1) also emphasises this by stating that a phenomenological paradigm involves the process of gathering individual perceptions and opinions to derive information through the utilisation of an inductive approach and qualitative methods such as interviews. Levy, Hadar, Greenspan and Hadar (2008:4) state that a phenomenological paradigm is applicable in the context where complex phenomena cannot be explained using quantitative methods.

3.2.2. Research approach
This research used an inductive research approach. The views, perceptions, opinions and assumptions of individuals were gathered and compared to existing views and proposed solutions on the topic at hand. Saunders et al. (2009:126), give clear points of departure between inductive and deductive approaches which is essential in the context of this study. Inductive theory is based on the research initiative aimed at explaining a specific phenomenon, however, not confined within the grounds of a specific theory. Qualitative research that is aimed at explaining human understanding, perceptions and attitudes towards a specific subject, within a particular context, and is associated with inductive research (Jebreen, 2012:167), which was the case within this study.

3.2.3. Methodological choices
A mono qualitative research method was utilised in the execution of this research project. Content derived from the data collected based on the opinions, perceptions and views of individuals was analysed to deduce the interviewees' views According to Levy et al. (2008:4), the utilisation of a qualitative research method is appropriate in instances where the researcher aims at explaining a phenomenon, as was the case in this study, rather than building on a pre-existing hypothesis.

3.2.4. Research strategy
In terms of a research strategy, this research was based on a case study research strategy. Robson (2002:178) defines a case study as a "research strategy that investigates a phenomenon within its real context". According to Yin (2003), the
"strength of case study method compared to others, lies in its ability to examine the case in an in-depth manner within real context". A single case study strategy was adopted since the SAPU was the only organisation in question. The project managers as part of this organisation’s project environment were the embedded cases. Saunders et al. (2009:146) emphasise the ability of a single case to present the opportunity to investigate and analyse a phenomenon that has not largely been explored previously and within the context of this study, the topic at hand had not previously been explored within the organisation. Wang et al. (2014: 240) also highlight the importance of utilising case studies in instances where the phenomenon under investigation cannot be statistically quantified, which was the case in the context of this study.

3.2.5. Time horizon
The time horizon within this research was cross sectional in nature. The research was conducted within a short space of time and changes in the variables were not monitored throughout time in order to derive conclusions. The data collected within that specific time informed the findings of this research. The scope of this study, a MCom mini-dissertation, also justifies this choice, since time was constrained. As opposed to longitudinal study that investigates the same variables by consistently collecting data over a period of time to arrive at a conclusion, cross sectional studies collect data on specific variables once within a short period of time and conclude (Payne & Payne, 2004:144) and it is the case within this study.

3.3. Research methods
During this study, a purposive sample was obtained from the target population of the study. Purposive sampling is defined as a kind of a sample "deliberately and purposefully" selected by the researcher due to the understanding or thinking that certain attributes are represented within the identified population (Vogt, 2005:253). According to Emmel (2013:45), purposive sampling is associated with inductive and interpretative research approach which is the case within this study. The identified target population, project managers within the SAPU, was relevant to address the study and its
research problem. After the sampling was completed, one-on-one face-to-face interviews were conducted.

3.3.1. Sampling

Tukel et al. (2008:193) indicate that knowledge has become an invaluable asset in the modern work environment and therefore project managers have an obligation to cultivate it and use it in different projects. This highlights the important role that project managers should play in championing KM interventions within their projects; hence this group was sampled in this research.

The PM environment within the SAPU is vast, as the organisation is large in size and is involved in a number of projects at any given time. However, the key focus for this study fell on project managers within the organisation since they are responsible for the management of projects. Through the use of purposive sampling which relied on the judgement and experience of the researcher (Emmel, 2013:48), ten project managers within the SAPU's Group Capital division (which deals with Capital Expansion projects) were identified and interviewed from the total population of 104 permanent SAPU project managers. According to Saunders et al. (2009:237), purposive sampling is associated with the research whereby a small sample is selected. Of the 104 project managers, 55 were mainly involved with the management of construction projects from development until execution, while the 49 focus either on development or execution.

Based on the sensitivity of issues relating to IC within the SAPU, the sample was confined to the SAPU's ten permanent project managers only. These project managers were selected on the basis of their involvement with the projects, throughout the entire PLCM, from development to execution within the Group Capital division of the SAPU. It must be taken into consideration that there were a number of permanent project managers with the Group Capital division of the SAPU; however, they typically played different roles, with some only dealing with project development, while handing projects over to another project manager to execute. The focus of this study on project managers who were involved with the projects throughout the entire PLCM was based on the idea
that KS is not a once-off activity, and is an on-going process which therefore required project managers who would conceptualise in that manner and could provide guidance as to how this process could be incorporated and adopted across the project lifecycle.

Biloslavo and Trnavčević (2007:279) highlight the importance of utilising specific criteria in determining the relevant personnel to be included within the sample based on the study objectives. The project manager is fully accountable for the project and has the authority to make certain decisions such as availing time and allowing project teams to participate in KS sessions or enforcing the adoption of KM practices within the project.

3.3.2. Data collection

Semi-structured interviews were utilised as data collection tool in this study and open-ended questions together with follow-up questions, to elicit explanation, were employed, see Appendix A. In conducting a qualitative investigation, face-to-face interviews are regarded as a powerful means of discovering the underlying facts of the study and improve the quality of data collected. This data collection tool is also deemed suitable for gathering data in projects that are sensitive in nature (Dialsingh, 2008:260). Jebreen (2012:167) emphasises the importance of utilising interviews as a data collection tool, especially in a qualitative research where people’s perceptions, ideas, views and feelings are important elements in answering the research questions. This supports the logic of using interviews within the context of this study. It must however be taken into consideration that the utilisation of semi-structured face-to-face interviews does not come without challenges.

Semi-structured face-to-face interviews often associated with privacy and trust issues whereby respondents are afraid to disclose sensitive information to the interviewer. It is imperative that a certain level of trust is developed between the interviewer and the respondents (Saunders et al., 2009:326). The fact that the respondents are not afforded enough time to think about the interview questions prior to the interview is also cited as one of the shortcomings of face-to-face interviews since the respondents have to think and provide answers on the spot, this might result in insufficient information provided as
opposed to other methods where the respondents has ample time to think and respond to questions thoroughly (Dialsingh, 2008:260).

Ten interviews were conducted with the project managers within the Group Capital division of the SAPU. On average, the ten interviewed project managers have been within the SAPU's employment for twelve years. The project managers that were interviewed had all been involved with at least three projects within the SAPU, with seven of the respondents previously and currently involved in the construction of the two largest construction projects and three of the respondents currently working on the renewable technology construction project. A recording device was used to capture the data from the interviews. This recorded data was then transcribed by the interviewer, which entails the conversion of data from a media format into readable text format for ease of analysis (Appendix B).

3.3.3. Data analysis
This study utilised descriptive coding as a means of data analysis. According to Layder (2013:132), descriptive coding is linked with the explanation of aspects in the social context and it is also characterised by connecting to particular people, time and places which is the case in this study. The transcribed data from the ten interviews was summarised to determine the keywords and phrases so that themes could be derived. Similarities and differences of the participants’ views were then determined from the themes and the findings generated. An Excel spreadsheet was utilised to categorise the keywords and phrases that were coded in order to further generate the findings from the data (Appendix C).

3.3.4. Reliability and validity
Reliability refers to process of ensuring consistency in the data collection and analysis by eliminating the possibility of bias (Saunders et al., 2009:328). In the case of this research, understanding the sensitivity of the topic in hand, great care was taken in the designing stages of the research. This included the use of consent letters signed
by the interviewees to ensure that they become aware that participation is voluntary and their response will be kept anonymous. Careful selection of the respondents based on access and working relationship with the interviewer also assisted in creating a trustworthy environment for the interview. In terms of data analysis, the use of the recording device assisted in ensuring the consistent capturing of response and interpretation. The themes from the response were then confirmed against other research in the literature. In order to ensure the validity of the data, clarity was provided to the respondents wherever required and probing questions were used to ensure that the information captured is a true reflection of what the respondents intended to say.

3.3.5. Ethics
Ethics were taken into consideration in the entire process of this study. Interviewees were informed that participation was purely voluntary and it was not by force. They were also made aware that the data collected would be kept anonymous and confidential. Such data would only be utilised for the purpose of the research study and not for any other purpose that the interviewees were not aware of. The interviewees also gave their consent to the utilisation of the recording device in the interviewee proceedings. A letter of consent was also signed by interviewees as a way of indicating their consensus for participating in the interview. The University of Minnesota (2003:35), states the importance of observing ethics in conducting studies where human elements are involved. They emphasise the importance of informing the participants of their rights. This entails making the interviewees aware that their participation is voluntary and they have the right to discontinue the interview without any fear of being victimised or abused hence ethics were adhered to in this study.

3.3.6. Limitations to the study
This study has a fairly small sample size which counts as a limitation since the results, although within the SAPU, cannot be utilised to draw a valid generalisation within the power utility or any larger context. The findings cannot be utilised to give a definitive representation of the perceptions of KM and KS practices as the facilitators towards the
enhancement of IC within the South African project environment. The sample population is only limited to the project managers within the SAPU, the findings can therefore not be utilised as a fair representation of the SAPU’s project environment.

There is little evidence, if any, that indicates that any similar research was conducted on this topic within the SAPU or within any other power utilities in South Africa or in the world, however, the study that was conducted within one of the SAPU’s largest construction projects, indirectly addresses certain elements of this research. Although IC studies have been conducted over the years, there are limited studies with specific and direct focus on enhancement of project-focused IC. Therefore, this research cannot build on any direct and sufficient existing grounds with regard to the utilisation of KS as a means of enhancing IC within the project environment of a power utility.

3.4. Conclusion
Research design and methods guide the research towards valid and credible findings which address the research problem, aims and objectives. It is therefore important that the research methods and techniques that are selected are aligned to this research problem, aims and objectives. Ethical conduct remains critical for ensuring the integrity of the research findings. This study employed a mono qualitative research method through utilising an inductive case study approach in a cross sectional time horizon. Purposive sampling and semi-structured interviews were utilised to this end. The empirical research findings are deliberated on in the next section.
CHAPTER 4

RESEARCH FINDINGS AND DISCUSSION

4.1. Introduction
The research findings of this study, as discussed in this chapter, are vital in the quest to guide the SAPU towards the appropriate course of action in identifying the underlying barriers to KS, and consequently applying the most effective KM strategy within the SAPU's project environment. If reasons for knowledge hoarding or the rejection of KS are known, they can be diagnosed and the right course of action can be taken (Husted, Michailova & Pedersen, 2012:766). The project environment is dynamic, unpredictable and thwarted by some of its own challenges, it is necessary to understand the root causes of the challenges faced in terms of KM and KS, so that the right solutions can be applied.

4.2. Summary of key findings
The section below summarises the key findings derived from this study through the analysis of the empirical data collected.

- All respondents agreed that "knowledge is power" and were positive with regard to the value of KS. The phrase "knowledge is power" was utilised to gather the project manager's perceptions as this concept was used within the SAPU's project environment by members of the project teams. Consistently, respondents linked the value of KS in the project environment of the SAPU to the improvement of PM competencies, the enhancement of the SAPU's knowledge base as well as its potential to build a PM capability through a PMCoE. However, respondents also indicated that the organisation is currently not doing well in terms of KS, due to a number of challenges.
There was a general agreement between the respondents that the SAPU is facing serious KS challenges, especially in the project environment, owing to different factors. Extreme time and resource constraints, lack of leadership support for KS and a stand-alone KM function were highlighted as the biggest challenges.

Commitment to the organisation, personal empowerment, personal development as well as training and mentoring other people for the improvement of the SAPU’s project execution, were considered key drivers by the majority of respondents for project managers to share their knowledge.

Two thirds of respondents agreed that KM should be enforced through governance such as KM and HR policies and by having KS activities included as key performance indicators (KPIs).

Having KM embedded within the PLCM had the full support of the respondents, however, a concern was at which point it should be embedded and in which ways specifically. Respondents mostly agreed that KM should form part of each stage of the PLCM, while some respondents were concerned that having KM embedded within the entire model and making it mandatory would increase the governance requirements.

The majority of respondents supported a reward system as a means of promoting KS, despite all the challenges that might emerge.

Having discussed the key findings of this research in the above section, the following part of this chapter will provide a detailed discussion on the findings of this study.
4.3. Discussion of research findings

4.3.1. Project managers' perceptions of KS

In order to determine the perceptions of project managers on KS, the concept of "knowledge is power" within the context of projects was investigated. The views of project managers on KS, the perceived value of KS and their opinions on whether KS has any role in the improvement of the PM knowledge base and competencies within the SAPU, were also explored.

All of the respondents agreed with the concept "knowledge is power", indicating that what is known by those involved in a project, is central to project success. Individual experience in projects was identified as a powerful and key success factor for running effective projects. Knowledge from previous projects such as that obtained from LL was considered, among others, as a key ingredient in the recipe towards effective and efficient project execution. This was attributed to the fact that, through LL, certain mistakes can be avoided, certain risks mitigated, informed decisions can be taken and the project can save on time and cost while improving quality.

The triple constraints in the form of time, cost and scope were considered by the respondents to be the main focal points of a project. Knowledge gained from previous projects regarding these issues, was deemed necessary to ensure that the mentioned triple constraints can be managed effectively. Respondents further pointed out that LL or any knowledge acquired from other projects could be integrated into subsequent schedules for the sake of project improvement.

The SAPU is in the process of building an effective PMCoE and as such, knowledge shared within the project environment was also deemed vital in ensuring that this vision is realised. KS was considered to be important by the respondents and it was emphasised that the more knowledge an individual possessed, the easier it became to execute a project. Knowledge is further differentiated between tacit and explicit. Tacit knowledge which is said to be stored in the human memory is considered imperative
and as such, it must be shared to better put the project at an advantageous position, according to one of the respondents.

The SAPU is ISO 9001:2008 certified, which requires that information must be stored in a central repository accessible to all who must use it. The positive attitude of project managers in terms of sharing both information and knowledge within projects, as also supported by the ISO 9001:2008 standard, is a good indication that KM, especially in the form of LL is well-known and its value understood within the SAPU's project environment. This is also an indication that although the general feeling is that KM is not functioning as effectively as it should within the SAPU's project environment, there have been attempts to implement the processes and embed them within projects.

KS was generally considered by respondents as the transfer of both information and knowledge from one party, be it a project or an individual, to another party. KS was also viewed as an integrated manner to bring different stakeholders together to share challenges, successes, failures and recommendations to ensure that they can avoid the same mistakes in their project planning and execution. One of the respondents also viewed communication, for example an exchange during meetings, as a form of KS where everyone is granted the opportunity to raise their views on the matter under discussion and minutes are taken. The respondents held the view that in projects, such communication must be defined in the project governance and guidelines such as the project management plan (PMP) and the engineering instruction manual (EIM), to delineate how the project is going to communicate with internal and external stakeholders.

KS is also considered as a form of training, development and mentoring of fellow employees and trainees by the respondents. The respondents are of the view that since projects are unique and dynamic, it is deemed necessary that such knowledge is shared across the projects and is stored in a central hub accessible to everyone who has vested interest and involvement in projects. The general view of the respondents indicated that there is indeed a clear understanding of KS within the SAPU's project
environment which on its own, is a positive move towards the realisation of the value of KS in terms of the collective know-how.

The respondents did not consider simply having knowledge as valuable, but indicated that sharing and applying such knowledge, for example LL, from previous projects to subsequent projects are valuable. In this way, knowledge is used to guide the appropriate methodologies, stakeholder engagement, communication, definition, planning, costing, scoping and execution of the project. In the initial stages of the project, sharing of knowledge from a senior project manager to a junior project manager, for example, was considered valuable by the respondents, as it may facilitate a quick start for the project. Better project execution, learning, improved performance and enhancement of future projects were among the key values of KS, as identified by the respondents. These findings are consistent with the research conducted by Subramaniam and Youndt (2005:454) who found that, no matter how valuable the knowledge is within the organisation, if it is not shared it is unlikely to facilitate innovation and become beneficial to the organisation. All of the respondents were in agreement of the potential value that KS could add within their projects, although some KS challenges such as time constraints were identified. Despite potential constraints, the respondents regarded KS as critical to improving the current negative reputation of the SAPU, especially in areas of finance and public relations.

Respondents also viewed KS as a way of preserving the intellectual property (IP) within the SAPU. It must be taken into consideration that IP is different to IC, and these concepts are not used interchangeably in this research. IP includes other "tangible assets such as patents, trademarks, copyrights (Bollen, Vergauwen & Schnieders, 2005:1167) while IC is solely focused on intangible assets such as knowledge which is the case in this study.

KS was also viewed as a way of bringing different perspectives to project teams in which everyone learns from the strengths of others, both individuals and projects. The majority of the respondents indicated that KS also plays an integral role in ensuring strategic alignment and team cohesion for building a high performing team, especially if one
considers that project team members are drawn into the project from multidisciplinary areas within the SAPU. Respondents indicated that strategic alignment of project goals is critical for project success since it has been proven within the SAPU that projects which are not well aligned are more likely to fail. For this reason, it is widely emphasised within the SAPU that the secret to project success lies in both sharing knowledge and applying it where necessary.

Since the respondents (project managers) have been affiliated with the SAPU for an average of 12 years, it is noteworthy that these individuals recognise the value of KS in order to achieve project efficiency. The longer a respondent has been affiliated with the SAPU, the more they seemed to understand and value KS, which contradicts the research conducted by Maake and Laughton (2013:7) mentioned in Chapter 2, within the CoJ museums. The discrepancy could be attributed to the differences in the environments of these two research settings. The project environment is unique, dynamic and also characterised by a quick turnaround, while museums generally operate in a more stable environment.

Although project environments are considered to be dynamic and unique, the view of the respondents was that projects seem to be subjected to similar challenges and barriers, hence it is important to share knowledge in order to induct newcomers into the projects and to reduce the unknowns, which increase project risk. Such knowledge was considered as critical for improving and optimising the PM processes within the SAPU. In this regard, respondents mentioned as examples the failures by two large construction projects within the SAPU in terms of budget overruns and delays which can be attributed to insufficient or lack of KS between the two projects resulting in repetition of similar mistakes. The above view of the respondents is consistent with the findings of the gap analysis which was conducted by consulting company between the two projects as it highlighted that KS was still a challenge (Eskom, 2014a:2). According to the respondents, two projects, one relating to gas and the other to a windfarm, were successfully completed within the triple constraints due to the continuous sharing, documenting and the application of LL.
Generally, the respondents believed that the SAPU was not fully benefiting from its KS potential due to a defensive culture and the collapse of KM processes when attempts were made to formalise them. This, according to respondents, impacted on the SAPU’s ability to effectively enhance its project IC. The view that KM processes such as KS tend to collapse when they are formalised is also supported by Peltokorpi and Tsuyuki (2007:123) who indicate that over-management of KM processes leads to bureaucracy and becomes counter-productive. Contrarily, in the findings of the research conducted by Mueller (2012:441) within the project environment of a multinational company based in Germany and Austria, it was discovered that KM processes such as KS were formalised as part of the project work and it seems to be working effectively.

The respondents were conversant on the invaluable role of KS on building and improving a PM knowledge base as well as improving competencies and capability within the SAPU. People were considered to be the most important asset and their knowledge was deemed to be key for the organisation to become competent in the competitive environment. Competency was generally viewed by the respondents as relating to people, while knowledge related to the information stored within the organisation’s information systems. All the respondents indicated that they were of the opinion that success could be achieved through effective KS practices within the organisation. Such successes were noted to be the avoidance of repeated mistakes and the improvement of the knowledge base and competencies of the SAPU, resulting in enhanced project definition, planning, execution, as well as the avoidance of project delays and budget overruns. The above findings were consistent with the research conducted by Wang et al. (2014:246), which revealed that both explicit and tacit KS contribute towards the enhancement of the building blocks of IC such as human capital through improved competencies.

Reduced reliance on external parties such as consultants and expatriates was also identified as important outcomes of successful KS by respondents. Respondents noted that the more the organisation continued to execute projects and share the knowledge effectively, the more likely the development of a database of project knowledge within
the SAPU would be. It was further indicated by the respondents that the more knowledge could be retained within the organisation, the more likely employees would be to learn and improve on project execution thereby embedding a culture of learning. About 30% of the respondents were convinced that effective knowledge sharing supported by governance, rewards and integration of KM into the PLCM could largely contribute towards building the LO that the SAPU aspires to be.

A common theme among the respondents was the notion that doing, as well as learning from others, were the most effective methods of learning. The more projects executed by the SAPU, the more knowledge will be shared and preserved. In this way, PM capability will be improved and competencies will be enhanced. Respondents were also of the view that building the LL from KS into processes will be an integral part of building and improving the knowledge base and PM competencies. Currently, the PM processes within the SAPU are not regarded by the respondents as being fully matured, therefore building KS into processes was deemed vital for improving the PM competencies and the SAPU’s knowledge base.

Respondents also noted that collaboration was critical to the enhancement of the PM competencies within the organisation. A 2015 construction industry survey indicated that, for organisations to achieve a high level of maturity in terms of construction project performance, collaboration between all the stakeholders involved (such as contractors, consultants, project teams and project owners) needed to be encouraged as much as possible (Armstrong, 2015:25). Collaboration was considered by respondents as imperative for ensuring the discussion of challenges and for the development of trust. One of the respondents was of the opinion that critical knowledge was lost during KS sessions if a contractor was absent, which emphasises the importance and high value placed on collaboration with stakeholders.

Factors that hindered the organisation from effectively enhancing and improving the PM knowledge base and competencies were identified by the respondents. One such factor was the effective governance of skills that are transferred from consultants to SAPU employees. The SKT clause within the SAPU’s contracts ensures that skills transfer
becomes the consultants' obligation to ensure that skills and knowledge are transferred to the SAPU staff. However, monitoring and evaluating this process and the value it adds was noted to be a great challenge by the respondents.

Another issue identified as a deterring factor towards the creation of an effective knowledge base, was insufficient mentoring and coaching of employees. Respondents alluded to the fact that the organisation was losing a great deal of knowledge when experienced SAPU employees, as well as consultants, left the organisation yet no formal process was in place to ensure that skilled employees mentored others. Ajmal et al. (2010:157) note that staff rotations within the project environment contribute immensely to the loss of knowledge within the organisation, especially when such individuals move out of the organisation. Considering this, the findings regarding the lack of mentoring and coaching leading to a loss of knowledge within the SAPU were not surprising. An assessment conducted by the PMCoE in 2014 indicated that a vast amount of knowledge is lost or scattered due to staff rotations and resignations in projects. Respondents confirmed this and noted that, if knowledge is shared within the SAPU it is shared within fragmented departments.

According to respondents, the organisation is still facing the challenge of bridging the gaps between theory and practice in project execution. It was noted that KM was regarded as the key element in assisting the organisation in transforming theory into practice and adapting theoretical concepts to the SAPU's context. It must be noted that, although respondents fully agreed that KS plays an integral role in enhancing IC, the above challenge confirms that the SAPU is currently underperforming in terms of KS and is not benefiting from its potential. As such, the SAPU's IC is not effectively enhanced and one respondent drove this point home by mentioning that the SAPU is eight years into the construction of one of its largest power stations and noted that, if KS was effective and PM competencies enhanced, the SAPU's own employees would have been capable to take over from consultants by now.

The 2015 construction industry survey also indicated that over two thirds (71%) of global construction projects in the energy and natural resources industry have experienced
high project failures due to budget overruns and delays associated with insufficient knowledge and skills (Armstrong, 2015:25). According to the SAPU respondents, the case within the SAPU was similar to that of large construction projects that were thwarted by such serious challenges. These findings support the need for an enhancement of IC within the SAPU's project environment to minimise project failures. It has been shown that insufficient sharing of information and knowledge leads to unproductive decision making, an outcome that is unacceptable in any business environment (Emuze, Smallwood & Han, 2014:227). These findings also highlight the negative implications for the SAPU if the sharing of knowledge remains a challenge and will most likely lead to the repetition of costly mistakes. To this end, the next section will highlight barriers to KS within the SAPU's project environment, as identified by the study's respondents.

4.3.2. KS challenges and barriers in the project environment

Respondents were in agreement that KM was facing serious challenges and barriers within the SAPU. If a task, such as KS, was not defined as part of a project requirement and time was not allocated specifically to that task in the project scope upfront, the likelihood of such a task being completed was slim. It was noted by respondents that a lack of KM integration into the scopes and schedules of projects was the beginning of KM implementation failure in projects. Pressure to deliver on time and resource constraints were some of the main challenges that respondents mentioned as being to blame for KM and KS activities being placed at a disadvantaged position. In a high paced setting such as the SAPU's project environment, respondents stated that KM activities were viewed as hindrances to performance and issues such as defensiveness, egocentrism and hyper-competitiveness were also noted as worsening the situation.

The respondents made it clear that the SAPU is governance and processes driven and therefore anything that is not part of the established processes or governance, will remain at the discretion of those in control of these projects. One respondent was quoted in saying that there is no obligation to do any KM related activities when involved in projects, that it is a "willy nilly" process and that people are more likely to
hoard knowledge for their personal gain, rather than share it with others. Initially, the project environment within the SAPU was not designed to be conducive to KS practices according to the respondents. Respondents also noted that no time was allocated to learning when project processes were captured and in some instances projects were even completed without harvesting any knowledge.

Respondents listed these challenges, coupled with insufficient or total lack of support, buy-in and sponsorship from leadership, as making the KM outlook within the SAPU even bleaker. Considering the SAPU's organisational structure and operations, KM does not have a sponsor at corporate level like other disciplines such as document and records management. Discouragingly, the lack of easy-to-use KM and KS processes, user friendly KM systems and tools as well as resource constraints were also emphasised by the respondents as barriers to effective KM.

The cultural diversity within the SAPU's project environment and failures to diminish the impact of these diversities were regarded by the respondents as some of the contributing factors towards KS barriers. The general view of the respondents was that people tend to share knowledge with the those individuals that they know and feel they can trust, but that the SAPU was doing little or nothing at all to overcome cultural discord within its project environment.

According to the research conducted by Ravu and Parker (2015:338) in one of the SAPU's largest construction projects, the challenge of cultural dynamics, communication styles as well as lack of trust or political related vendettas between the project teams significantly hindered KS. This is supported by the notion that a "high growth value" counts among the barriers towards effective KS. As the organisation recruits new employees, it becomes difficult to effectively share knowledge since it will take time to develop trustworthy relationships (Mueller, 2012:441). Such is the case within the SAPU as the increased number of construction projects has led to high numbers of new staff within the organisation. Graham and Thomas (2008:115) also agreed that staff rotations and resignations contributed immensely to knowledge loss within organisations, especially in construction projects. It does however seem that, if continuity is achieved in
terms of the staff component, knowledge is more likely to be shared and effectively applied, as one respondent said: "one of the success factors of the SAPU’s gas construction project, was the ability to maintain the same or majority of the project team members throughout the project".

Respondents identified one of the root causes to KS difficulties as being the lack of KM integration into project governance in components such as the PLCM, project management system (PMS), PMP and project schedules. KM seems to be remembered only when there is a crisis and it becomes necessary to react, instead of being managed proactively as part of the organisational culture as indicated by the respondents. Respondents noted that the SAPU's project environment is not conducive to KS, as teams are pressed for delivery from the onset of each project with overly optimistic time frames and resource constraints. It was again noted by the respondents that no time is typically allocated for learning during a project's life cycle and as a result no opportunity is created for learning from the mistakes and successes of previous projects.

On rare occasions, respondents report, you will find that contractors are available to honour their SKT obligations, but the project teams are usually highly pressed to meet deadlines and the project manager cannot release them to partake in KS initiatives. One of the respondents indicated that, for example, "if we were to embark on the construction of another large construction project, we will be put under pressure from day one by different stakeholders". This pressure to work faster is not conducive to a culture that takes time to share and manage knowledge. Akhavan et al. (2014:99) emphasise that over-optimistic project commitments in the form of unrealistic targets, tight schedules and highly constrained resources are among the causes of poor learning in projects. The limitations may result in apathy and an unwillingness to partake in KS initiatives by the project teams which seems to be the case within the SAPU's project environment.

Planning, communication and performance measures such as KPIs are crucial towards project success according to the respondents and KM is not catered for in the same way. Respondents noted that neither KM nor KS are currently included in such measures of performance. Limited or a lack of leadership support was also mentioned
by respondents as factors contributing to the insufficient successes of KM and KS. Furthermore, respondents reported that KS is seen as a blame game, where individuals perceive it as an opportunity to point fingers at each other and to ostracise culprits who are perceived as contributing towards project failures. For this reason, people are typically not willing to open up and share their views, especially on sensitive matters related to project failures; they are likely to become defensive. The project environment within the SAPU is not conducive and processes are not mature enough to accept mistakes or failures as a learning curve according to the respondents.

The research conducted by Husted et al. (2012:766) indicates that negative attitude towards mistakes is typically linked to knowledge hoarding behaviours. The more people feel negative about their mistakes, the smaller the possibility that they will share their knowledge. It can, however, be deduced that although the research was conducted in a different environment setting, it is in support of the findings within the SAPU's project environment. Also with the current public scrutiny due to delays and budget overruns in some of the largest construction projects, it is difficult for people to share knowledge especially on failures as they might feel it will portray them as culprits who are contributing to the project failures, hence the perception of KS as a blame game and the defensive attitude towards criticism.

The respondents indicated that most KS sessions are conducted in a workshop format, whereby participants from different disciplines or projects are convened at one venue to discuss the matter at hand, share successes, failures and recommendations, hence it might be perceived as a blame game and people become defensive. It can, however, be indicated in this regard that the defensive attitude and the fear of being seen as a failure hinders KS practices within the SAPU's project environment and it has negative implications as the organisation will continue to repeat the same mistakes. In the project environment of other companies, Mueller (2012:441) found that mistakes are regarded as learning curves and as a result their KS practices flourishes as opposed to the situation within the SAPU.
A general lack of appreciation of the value of KM within the culture of the larger SAPU, combined with a feeling of ownership or entitlement of knowledge by individuals, were also highlighted by the respondents as contributing factors to the KS challenges. Husted et al. (2012:754) highlighted the eminent danger of a tendency by employees to hoard knowledge and stated further that, although KS was a voluntary process which was associated with an individual's positive attitude towards KS, people were often more likely to feel a certain level of entitlement to their accumulated knowledge and as a result tended to personalise and hoard it. In this regard, ego also plays a role and in the case of the SAPU, individual project teams may become defensive and try to showcase their value and justify their existence by stockpiling the knowledge that they have built up and dismiss any recommendations from others in the hope of it giving them a competitive edge. As already indicated by Husted et al. (2012:766) KS barriers can only be addressed appropriately if the causes are known. The next section will explore some of the possible strategies to address the identified KS barriers.

4.3.3. Possible strategies for overcoming KS barriers

In an attempt to determine possible viable strategies that could be utilised to overcome KS barriers and challenges within the SAPU, factors such as motivation for KS within the project environment, the use of enforced governance and the KM process being entrenched into the PLCM, were investigated. Other solutions to overcome the KS barriers within the SAPU's project environment were also explored by posing an open-ended question to the respondents to give their views.

Commitment to the organisation and an inherent willingness to assist in solving challenges in project execution were considered by respondents to be two of the dominating factors that motivate individuals to share their knowledge. According to respondents, employees with an eagerness to empower, develop, mentor, teach and build performance in others also encouraged KS within the SAPU project environment.

Incentives and a work environment that ensures job satisfaction were also considered by the respondents as motivators for KS. Respondents described such an environment
as one in which people are not unduly stressed due to realistic deadlines that are set. Irrespective of the challenges such as workload, poor leadership support and lack of any acknowledgement or rewards, project team members share their knowledge because they understand the value and also that knowledge from colleagues assist in easing their workload, according to the research conducted in the project environments of other companies (Mueller, 2012:441). Respondents echoed this sentiment by indicating that, despite the KS challenges and barriers faced by the organisation, they were still willing to do their best to share knowledge to improve the SAPU's project environment and the organisation at large.

Of the interviewed project managers, a majority (seven of the ten) agreed with the notion of enforcement of KM policies and contracts as they felt strongly that KM would not be implemented effectively unless it is enforced. Husted et al. (2014:768) found that commitment based governance mechanisms such as formal structures and policies were likely to eliminate knowledge hoarding behaviours within an organisation. Huang, Chiu and Lu (2013:768) also showed that proper enforcement of governance through Human Resource (HR) policies in the form of performance evaluations had a positive effect on KS. Respondents noted, however, that the role of leadership in the enforcement of KM processes would be critical to ensure success both at a managerial and an operational level. According to Anantatmula (2008:449), both leadership and managers should play an integral part in the development and implementation of KM processes within the organisation, since the implementation of KM processes such as KS requires behavioural as well as practical change within the organisation and leadership is crucial to drive this change for effective functioning of KM.

The SAPU is a Public Financial Management Act (PFMA) Company which deems compliance as important and enforcement of necessary policy was regarded as commonplace by the respondents. Respondents also considered governance of KM practices as a positive strategy in order to move the SAPU towards a change of culture. This view, however, was inconsistent with the argument by Park et al. (2004:107) who indicated that a culture change is one of the most difficult things to achieve within an
organisation and the value of change needed to be emphasised and a good communication strategy needed to be put in place, opposed to forcing it down.

Three of the ten respondents were firmly set against enforced KM governance and were of the view that enforcement will defeat the purpose of KS. These respondents were of the opinion that enforcement of KM through governance will have negative implications, stating reasons such as the expansion of governance requirements, which would have time effects on projects. One of the respondents indicated that some projects are already delayed by ten years due to governance barriers from both within the organisation and from external stakeholders. This opinion was also supported by research conducted by Price Waterhouse Coopers (PWC) (2013:5) on South African construction companies in which increased governance barriers were considered to be among the top risks by the sampled construction companies in South Africa.

KS was viewed as a voluntary process by the respondents opposed to enforced governance of KM, who were also of the opinion that KS must form part of the organisational culture. These respondents noted concern over KS becoming a "tick the box exercise" with little, if any, value derived due to the likelihood of poor quality of knowledge that will be shared under forced circumstances. The respondents further stated that KS depended heavily on the willingness to share and willingness to learn from the project teams. Although these respondents had reservations regarding enforced governance, the literature supports the notion of managing knowledge in this way. Huang et al. (2013:768) found that formal and informal governance contributed positively to KS practices within an organisation while Schroeder and Pauleen (2007:425) indicated that enforced governance was ideal for embedding KM practices within the organisation.

There seemed to be consensus among respondents in support of having KM embedded within projects, however, there seemed to be specific ideas around where and how it should be embedded. The respondents were all of the view that KM should form part of the projects and be embedded into the PLCM, PMP, EIM, scopes and schedules. Eight of the ten respondents were in agreement that KM should be enforced as part of the
PLCM and that it should be included as a stage gate, not allowing projects to proceed until certain KM requirements were fully covered. These respondents reasoned that, if KM implementation was to be compulsory at all phases of the project, it would be implemented and would improve project execution. One of these respondents did acknowledge the challenges that such a forced approach will bring, stating that it will most probably be seen as inefficient at the beginning and there will be resistance, but the respondent was optimistic that with time, the notion would "settle well".

Two of the eight respondents that were of the opinion that KM should be enforced as part of the PLCM, strongly believed that KM should form part of the project definition readiness assessment (PDRA) stage within the PLCM. It was further emphasised by these respondents that KM should not be a stand-alone initiative and that it should form part of the project requirements if it was to succeed in projects. With KM embedded in the PLCM, the respondents noted that its implementation would be compulsory and be catered for in the project scope, resulting in knowledge being captured at all the phases of the project. Davidson and Rowe (2009:566) support the integration of KM into the project life cycle as a stage gate and also promote embedding it into a project team’s operations. As noted, the majority of respondents agreed with this notion and were convinced of the possible positive outcomes of such a requirement, since knowledge would be captured at each project phase and incorporated into project plans for the improvement of the subsequent project phases and future projects. Pauleen and Huff (2012:14) also supported this notion and stated that governance mechanisms played an integral role in ensuring integrated, guided, controlled and visible KM programs within an organisation.

Two of the ten respondents only supported the integration of KM into the PLCM and were also concerned about the fact that the governance landscape within the SAPU was already time consuming and exhaustive, often contributing to delays. These respondents feared that, if these governance requirements were added onto the already considerable existing governance, the situation within the SAPU environment would worsen in terms of delaying the initial stages of projects; these respondents indicated that KM governance should therefore not be made a stage gate.
Seven of the respondents were adamant that rewards could play an integral part in promoting KS within projects, and cited that rewards would boost morale which is an important part of KS. Project efficiency is considered to be the dominating advantage that a rewards system can bring to the project environment within the SAPU according to the respondents. Respondents noted that any monetary reward would be negligible to the SAPU if compared to the potential benefits of KS, especially if it contributed towards building a LO by entrenching a culture of learning. The recommendations of the research conducted by Suppiah and Sandhu (2011:472) are consistent with the above views since rewards and recognition systems are regarded as means of instilling a KS culture. Successful rewards could take any form such as recognition, praises, incentives, professional status; these were all found to be motivating to people in order to share knowledge.

In contradiction with the above mentioned findings that support the use of a reward system and incentives to promote knowledge sharing, Mueller (2012:441) discovered that project teams did not need rewards in order to share knowledge, they were rather motivated by the positive experience of engaging in KS. This contradiction could be attributed to differences in the environments in which the research took place.

Two of the seven respondents who supported the idea of rewards for sharing knowledge, indicated that implementing such a practice would prove difficult in a team based environment. These respondents were of the opinion that only innovation and work beyond the call of duty should be rewarded and the enforcement of KS should also come with a punitive measure for non-compliance embedded into the processes. These respondents further indicated that measuring the value brought by the implementation of a reward system might be a challenge. They, for example, asked "how do you determine if a specific idea has added more value than other ideas?", further indicating that effort should not be rewarded at the expense of results. The research conducted by Ravu and Parker (2015:338) within one of SAPU's largest construction project, recommended that regular surveys should be conducted to measure if the transfer of knowledge was indeed taking place and adding value to the knowledge receivers. There was a positive
indication that the respondents understood the contribution that rewards systems could make in terms of promoting KS, however, they indicated that a well-thought out and considerate approach should be taken to ensure that the process bore the expected results.

Three of the ten respondents disagreed with the use of rewards as a means of promoting KS and specifically noted the challenges that would arise if rewards systems were to be implemented. These respondents were of the opinion that rewards systems, especially incentives were not sustainable and once the reward system fell away, KS would collapse. KS should not be regarded as something to be rewarded, according to these respondents, but should be regarded as the obligation of those executing organisational processes, since institutional memory belongs to the organisation. These respondents further stated that incentivising KS would lead to the commercialisation of the knowledge, which may become costly and may create more challenges, rather than leading to KS being impeded as part of common practices. The lesser quality of the knowledge shared, intra-team competition and silos, favouritism or driving hidden agendas were just some of the possible disadvantages according to the respondents. The findings on the potential negative implications of rewards on KS are fully supported by Husted et al. (2012:766) who discovered that transaction based mechanisms such as rewards are likely to increase knowledge hoarding behaviours as people will start utilising knowledge as their source of competitive advantage so that they can be rewarded.

The creation of forums to share knowledge, in which people must present papers and gain professional status as opposed to incentives, is another means of promoting KS that was recommended by the respondents. They indicated that non-formalised forums that encouraged social interaction between different project teams could promote KS within SAPU's project environment. As quoted, one of the respondents indicated that "we used to have braais on site in my previous job at another company and it used to help in establishing friendships and sharing of knowledge in an informal manner". Another respondent also alluded to the fact that certain controls should be relaxed in order to enable the flow of knowledge between projects. These controls include strict
meeting protocols, in which junior staff is not allowed to attend certain or most of the meetings. The above findings are supported by the research conducted by Huang et al. (2013:768) which revealed that informal governance in the form social interactions such as eating lunch together; water coolers, team buildings and social communities contributed effectively towards establishment of the much needed friendships that were critical for KS.

Continuously demonstrating KM benefits by dedicating KM resources to projects, empowering project managers to better manage dominating cultures from different departments and decisiveness on how KM should be implemented, were also considered critical for the successful implementation of KS within the SAPU's project environment. Respondents further indicated that more focus should be placed on leadership support, integration of KM into the PLCM, the motivation of people, the development of a user-friendly and easy to access KM system and consistent scheduling of LL sessions. These are consistent with the findings by Schroeder et al. (2012:14) in which they found that codification oriented KM programmes, which is the case within the SAPU, required more technological infrastructure, integration into processes and dedicated personnel to ensure that best practices were captured and accessed by future projects. Mentoring and coaching was mentioned to be taking place in certain areas but respondents commented that it should be formalised and become part of all the projects. The respondents were also of the view that a change of culture from defensive mode into an open learning culture that accept criticism as a way of improving project execution, would be vital for the success of KS within this environment.

Having discussed the possible implications for implementing the proposed strategies to overcome KS barriers within SAPU's project environment, the effectiveness of these strategies will play an integral role in the enhancement of IC within the SAPU. These strategies will ensure that knowledge flows effectively within the organisation, thereby continuously building on different layers of IC as the organisation continues to learn, optimise resources and improve processes (Wang et al., 2014:327). It is therefore imperative to take into consideration that the ability of SAPU to create a conducive
environment in which KS thrive through the implementation of the above proposed strategies will enable the continuous enhancement of IC.

4.4. Conclusion

Although project environments are dynamic and unique in nature and therefore have different KM challenges, culture still remains one of the key determining factors for KM and KS success within an organisation. The role of leadership in instilling a culture that promotes the adoption of KM practices such as KS, is of paramount importance in ensuring that value adding KM programmes are pursued. Through the cultivation of an open learning culture, KS challenges such as defensive attitude, egocentrism, time constraints and fear of criticism can be overcome. This can be achieved through leadership's involvement in both the development and implementation of KM programmes since such programmes can be customised to suit the environment that they are developed for.

Various strategies can complement leadership support, including embedding KM into the project life cycle and enforcing the implementation of KM through governance and rewards systems. These strategies can assist leadership in entrenching a KS culture within the project environment. It is, however, worth noting that the success of each of these strategies depends heavily on the organisation's hierarchy and culture, therefore it is pivotal for leadership to ensure that the right strategies are pursued. Implementing a value adding KM programme that enhances IC through KS within the project environment, is a challenging task requiring the championing and commitment of leadership and the SAPU’s project environment is not an exception. Chapter 5 summarises the findings, provide recommendations and concludes this research study.
CHAPTER 5

FINAL CONCLUSION AND RECOMMENDATIONS

5.1. Introduction
For KS to thrive within the SAPU, especially within the project environment and for it to contribute towards the enhancement of IC, certain factors that serve as enablers of KS need to be in place. The perceptions of project managers towards KS, their understanding of the process as well as their knowledge of the value of KS, were considered to be the key determinants of how successful the initiatives will be, specifically within the project environment. It became clear that, irrespective of the project manager’s knowledge and appreciation of KS, challenges would always arise as a result of organisational issues beyond their control or as a result of the dynamic nature of projects. It was evident, however, that KS could enable project managers to explore different strategies that could assist in overcoming these challenges. This section provides a summary of the findings of this research and explores recommendations for possible implementation and towards future research.

5.2. Summary of findings
The concept "knowledge is power" is commonly used within the SAPU and is generally associated with knowledge hoarding as opposed to sharing. In the context of project environment within the SAPU, however, the power of knowledge was viewed in terms of sharing and application of such knowledge, usually in the form of LL in order to improve project performance. In terms of the PM triple constraints of time, cost and scope, knowledge was viewed as a valuable resource towards the successful execution of a project. KS was also regarded as the means of sharing both information and knowledge between project team members and other projects in order to improve project definition, planning and execution.
The minimising of risk and the avoidance of mistakes were considered crucial in ensuring that projects are executed successfully within budget, time and quality and KS was seen as being conducive to achieve these goals. Effectively, ensuring project efficiency was regarded as the ultimate goal of KS for projects within the SAPU, from the project managers’ points of view. Empowering and developing people, as well as achieving project success, were the key motivators for project managers to share their knowledge.

The risk that is posed by the “knowledge is power” mentality, potentially causing it to be hoarded or privatised for individuals’ own benefit as opposed to organisational benefits, cannot be ignored in the larger context of the SAPU. It was clear that, although project managers were aware that some people within the project environment bought into this knowledge hoarding mind-set, they were positive about KS and the value it holds for their success in project development and execution.

Besides noting the value that knowledge could hold for individual projects, KS was seen by the respondents as a vehicle towards the enhancement of competencies and the building of a PM capability within the SAPU itself. Respondents believed that, through embedded KS practices, the SAPU could become the LO that it aspires to be and it could build the necessary skills required for effective project execution internally, while reducing its reliance on consultants from other countries. This study made it clear that the SAPU and South Africa were still facing a skills gap challenge in certain specialised areas such as the execution of complex projects. Respondents perceived the value of KM processes such as KS as a means of contributing towards bridging that gap. This could be achieved through the use of other tools that facilitate KS such as mentoring and coaching, training and improved SKT programs. Unfortunately, it was clear that the SAPU was not perceived as being successful in terms of utilising its KS practices to promote learning and bridge the skills gap at this time.

Throughout the study, it was noted that, although there was a clear understanding of KS and its value within the project environment of the SAPU, there were many KM barriers which hindered the enhancement of competencies, knowledge base and ultimately the
PM capability within the organisation. According to the literature, leadership support is regarded as the foundation of successful KM implementation, but in the context of the SAPU's project environment, there was minimal or no leadership support for KM initiatives, as indicated by the respondents. In compliance, process, governance and hierarchical organisational design type such as the SAPU, the success of KM initiatives such as KS, without leadership support would be highly unlikely.

Currently, KM within the SAPU is seen as a stand-alone concept since it is not integrated within the project environment through the PLCM. KM activities such as KS have become discretionary and at times these concepts are totally forgotten until challenges are encountered. It was not surprising that time and resource constraints were also listed as major contributing factors towards KS challenges in the SAPU's project environment. It was clear that the lack of integration of KM into the PLCM saw KM activities such as KS left out of the planning phase of projects, which implied that dedicated time was never allocated to such activities in the project schedule. Project teams were noted to be highly focused on project execution and meeting tight deadlines, and reflection and learning would only happen if there was time. Although KS was met with a positive attitude among respondents, the prevalence of highly pressured project teams with unrealistic timeliness were unlikely to be conducive to mental states being willing and able to engage in KS practices.

The study revealed that, in order for people to be open and share their knowledge, be it positive or negative, the environment needed to be conducive and supporting of this behaviour. Currently, the environment within the SAPU's project environment and the organisation at large did not seem to be a favourable learning environment in which, for example, mistakes were embraced as part of a learning curve; this led to the prevalence of a defensive organisational culture. If individuals are ostracised for making mistakes, which seemed to be the typical course of action within the SAPU, it becomes difficult for them to share their experiences, since they might be seen as culprits contributing towards project failures. Furthermore, egos were also associated with a defensive and competition driven attitude between project teams within the SAPU, which resulted in
poor sharing or acceptance of knowledge as opposed to a collaborative effort towards project successes.

Culture was continuously credited as a potential key enabler towards effective knowledge flow within the SAPU. Respondents noted different cultures that were present within the SAPU's project environment and stated that the integration of these cultures to build mutual trust was still a challenge and resulted in difficulties to share knowledge, since people tended to share best with people they trusted.

Having deliberated on the challenges faced by the SAPU's project environment, the study also focused on possible strategies that could assist in overcoming these challenges. Commitment to the organisation and a proclivity towards ensuring the development and empowerment of people in order to achieve organisational goals remained at the top of the list for project managers' motivation to share knowledge. Respondents also revealed that incentives and a motivating work environment could also potentially contribute towards KS.

KM governance was also listed as being important in terms of guiding the organisation towards the achievement of its KM deliverables. Respondents were sided with the notion that enforced governance and reward systems were the most probable means of successfully promoting KS within the SAPU's project environment. It was, however, noted that attention should be given to the approach of these initiatives, specifically to the processes and methods of measuring the value of knowledge shared as well as determining the level of input deserving rewards.

The potential of negative implications of both enforced governance and rewards was noted by respondents, and suggestions were made that the processes should be executed through the use of HR processes as well as exploring other rewards mechanisms such as gaining of professional status, rather than solely depending on incentives, which alone might not prove effective. Embedding KM into the PLCM was considered to be an ideal way to ensure that KM processes such as KS were adopted within the project environment; however, respondents warned that a cautious approach
would need to be employed to ensure that it does not become inefficient. Certain recommendations were further provided to enhance the KM implementation approach within the SAPU's project environment.

5.3. Recommendation on research findings

Based on the findings as discussed, the following recommendations can be made:

- **Leadership should take ownership and be accountable for ensuring effective implementation of KM within the SAPU's project environment.** The role of leadership in terms of cultivating and paving the much needed open, transparent and KM conducive environment vital for effective KM implementation remains invaluable. With effective leadership commitment, support and sponsorship, while also leading by example ("walking the talk"), KM processes such as KS can be instilled as part of the SAPU's culture within the project environment which will be beneficial to the organisation and South Africa at large, considering the role that the organisation plays towards economic development. All of the following recommendations also rely heavily on leadership support.

- **Integration of KM into the PLCM and embedded throughout the project to ensure that KM initiatives become part of the project requirements from the project definition phase.** It is, however, imperative that a thorough analysis be done prior to such integration to ensure that the initiative is perceived as beneficial, as opposed to being perceived as contributing towards more project delays.

- **Enforced governance and rewards systems are to become a vehicle towards realising value adding KM practices within the project environment of the SAPU.** Although it is considered that enforcement will be faced by resistance in the beginning, it is also believed that it is the ideal mechanism to overcome some of the attitude and ego related barriers within the SAPU's project environment. As one of the respondents indicated "dictatorship might be the best form of culture change within the SAPU's project environment". Rewards mechanisms such as
recognition and professional status can also be implemented without only relying on monetary incentives, since these alone might not be effective.

- **Formation of KS forums is recommended.** KS practices thrive more effectively in an environment that is relaxed, social and supported by a certain level of trust between the knower and the receiver. It is therefore suggested that promotion of a more relaxed social environment for the project team members and between projects can create the level of trust and integration of cultures to overcome some of the KS barriers.

- **Effective KM processes and procedures should be implemented and user-friendly systems, tools and dedicated project resources should be readily available.** Easy to follow KM processes that are well integrated to the project environment will serve as among others, the key enablers of KM practices. It is also emphasised that the development of KM processes should not just be the role of KM practitioners alone, it should be an engaging process to ensure effective integration as well as buy-in into the processes. Technology remains an important KM enabler, especially in an environment where people are scattered across different geographical areas such as in the SAPU's project environment. It is, however, imperative that technological platforms and tools that are acquired for KM are flexible enough to cater for the SAPU's specific requirements and are able to keep up with the changing environment. For KM to function effectively within the project environment, dedicated KM resources should be allocated to the projects.

- **People are to be recognised as invaluable resources for enabling value added KS practices.** People should consistently be motivated to share knowledge and learn from others. With leadership being accountable to cultivate a culture suitable for KS within the SAPU's project environment, the value of people should also be acknowledged. Employees should be given the opportunity to learn and should also be required to honour the SKT agreements with the external partners.
Enhancement of mentoring and coaching functionalities should take precedent. As indicated, the SAPU is losing knowledge when its experienced employees retire or when contractors complete their contracted works. It is vital that mentoring and coaching initiatives are focused on addressing this gap.

5.4. Recommendations for future research
Few researchers have investigated the enhancement of IC within the context of the project environment, deeming this research valuable towards building the IC body of knowledge within a project environment. The way in which KS enhances IC within a project environment, specifically human capital, is still under research and this study could make a valuable contribution to that end. Recommendations for future research include:

- This research has a fairly small sample size and is based on cross sectional research design. It would be ideal to further conduct similar research with a larger sample size and a longitudinal research design in order to monitor the effects of the continuously changing project environment on the results or even utilise action research to pilot the practical nature of some of the recommended strategies.

- The sample of this study consisted of project managers alone, due to their influential role in projects, as well as the responsibilities resting on them in terms of ensuring that the project is executed within the triple constraints. It would be valuable to expand the sample by including other project team members such as project coordinators, planners, cost engineers and schedulers to understand their underlying challenges as well as gauging how the proposed strategies can affect their roles in terms of project execution.

- Although strategies such as using rewards mechanisms are highly recommended, it is of utmost importance to note that methods of measuring the value of the knowledge shared to determine the recipients of such rewards are
still vague. It is suggested that this research be built on by exploring the models that can assist in determining the value of the knowledge shared and the kind of rewards that could be granted for a specific level of contribution (e.g. knowledge that would assist the organisation to achieve its goals and objectives). Exploring this could lead to the utilisation of effective rewards mechanisms to assist an organisation in instilling a KS culture that will enable the enhancement of IC.

- The relationship between IC and culture within the project environment is not extensively investigated within the context of this research. Further research exploring this relationship, specifically in the project environment, is recommended.

5.5. Conclusion

Projects are dynamic and unique in nature. Implementation of KM into the project environment is challenging, however, the value of successfully embedding KM processes and practices such as KS in the project will be considerable. The successful execution of a project within the triple constraints of time, cost and scope remains as a critical item on the project manager’s list of priorities. KM practices such as KS are instrumental in assisting project managers in project efficiency by avoiding repetition of mistakes, mitigating risk and enabling improved planning; as quoted from one of the study’s respondents "the less you know, the more costly the project becomes".

Time remains the project’s most valuable resource that must be managed effectively to ensure that all other resources such as money and people are well coordinated. In this context, it then becomes a difficult balancing act between allocating time for reflection and learning and solely focusing on delivering the project within time. This scenario leads to conflicting objectives between the project and the organisation, while the former focuses solely on short term objectives of project completion within time, the organisation takes future goals, such as continuous learning, into consideration. The situation is usually the result of ineffective planning for KM initiatives, such as KS sessions, emanating from a lack of KM integration within the PLCM.
Integration of KM into the PLCM will assist in ensuring that KM initiatives are planned for upfront, however the achievement of this integration relies heavily on the buy-in and support from leadership. Complementing the PLCM integration with enforced governance and rewards systems are presented as possible steps towards the implementation of effective KM processes that facilitate KS, within the SAPU's project environment. Other barriers such as defensive attitudes, ego, mistrust, hyper competition, cultural strains and unwillingness to share, can be overcome through leadership's commitment towards building a KS environment which is conducive to learning.

An environment which is conducive to learning is of the utmost importance for organisations such as the SAPU. The organisation is currently in pursuit of becoming an LO to adapt to changing circumstances, while bridging the skills gap in specific specialised areas. It is acknowledged that such skills gaps are not a challenge only within the SAPU's project environment, but throughout South Africa, hence the recruitment and placement of expatriates to achieve specific project goals. The employment of expatriates and other consultants is also another means aimed at enhancing the internal SAPU skills as indicated within the SKT clauses within contracts, however, achieving such objectives is still a challenge. It is evident in this context that KM within the SAPU's project environment is not functioning effectively as it should and benefits are not realised at an expected scale due to some of challenges already discussed above. KM processes such as KS are still regarded as vital towards the enhancement of competencies, knowledge base and the improvement of PM capability within the project environment of the SAPU.

In conclusion, it can be stated that the findings in this research indicate clearly that KS does play an integral part in the enhancement of IC within a project environment, especially in terms of human capital. KS enhances IC within a project environment by improving the competencies of employees and the knowledge base from which these employees function, which is critical for the development of a functioning PMCoE. Through effective KS practices, the PM capability is reinforced thereby increasing the
skills base which will eventually lead to reduced reliance on external parties such as consultants and expatriates in the execution of projects. The organisation will become independent while reducing the cost of executing projects since the skills and competencies would have been built internally.

The SAPU is currently underperforming in the area of internal skills development and retention. It can therefore be concluded that, despite the challenges that the organisation might face in terms of its KS initiatives, KS remains a vital component towards the enhancement of IC within the SAPU's project environment and towards ultimately building an LO. Projects in the energy and natural resources sectors are the worst performing projects, which calls for a greater emphasis on KS within the project environments of organisations such as the SAPU, to ultimately enhance IC.
6. REFERENCES


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APPENDIX A: INTERVIEW QUESTIONS

INTERVIEW COMMUNICATION AND INTRODUCTION

I am Happy Maake from EPMO within the Group Capital division in Eskom. I am currently enrolled in a Master’s degree in the field of Information and Knowledge Management at the University of Johannesburg. I am conducting a research for my dissertation with regard to Knowledge Sharing within the Project environment of the organisation whereby I will be interviewing Project managers within Eskom. I have already been granted the permission to conduct this research by relevant authorities and I am asking for permission to interview you. My interview will only take few minutes of your time, about 30 minutes to be precise. May we please arrange an appointment?

ON THE DAY OF THE INTERVIEW

As per our interview arrangement, I am here to honour our appointment and to inform you that I really appreciate your time. Kindly note that this interview will be kept anonymous; your name will not be exposed. The feedback from this interview will be used for my research study purposes only. May I please have your permission to record our interview for evidence and reference purposes to my study? We can then began with the interview.

SECTION A: BIBLIOGRAPHIC INFORMATION

- Kindly give a brief introduction of who you are?
- How long have you been in Eskom?
- Your role and the projects you are working in?

SECTION B: PROJECT MANAGER’S PERCEPTIONS ON KS

- What is your view on the concept "knowledge is power" in the project environment?
- What is your understanding of knowledge sharing within projects?
- What do you think is the value of sharing knowledge within and between projects?
In your opinion, does knowledge sharing in projects improve organisational project management knowledge base/competency?

SECTION C: KNOWLEDGE SHARING CHALLENGES/BARRIERS

- What are some of the common knowledge sharing challenges within the project environment in your view?
- What do you think are some of the potential attributing factors/root causes to these challenges?

SECTION D: POSSIBLE Viable STRATEGIES FOR OVERCOMING KS BARRIERS

- What would you consider as a source of motivation for knowledge sharing for project members in general?
- What is your view on enforced governance as means of promoting knowledge sharing within projects e.g. enforced contractual obligations, enforced policy?
- How would the embedding of KM into the PLCM as a project requirement enable knowledge sharing in your view?
- What is your view on rewards such as incentives or any form of recognition as a way of encouraging knowledge sharing within the project?
- What are other means that you think can assist in overcoming knowledge sharing barriers in projects?

SECTION E: POTENTIAL IMPLICATIONS OF APPLYING THE PROPOSED STRATEGIES

- How do you think enforced governance (policy and contractual obligations (though shall) approach can affect knowledge sharing practices within the projects?
- What do you think are the advantages of using a reward/incentive system as means of encouraging knowledge sharing within projects?
- What do you think are the disadvantages of using incentives/reward systems as means of encouraging knowledge sharing within projects?
What do you think will be the outcomes of embedding KM into PLCM as a project requirement can affect Knowledge sharing within projects?

SECTION F: GENERAL

Are there any suggestion, recommendations and additions you would like to give with regard to the knowledge sharing as a means of enhancing intellectual capital within the organisation?
# APPENDIX B: SCREENSHOT OF A TRANSCRIBED INTERVIEW

<table>
<thead>
<tr>
<th>Knowledge sharing as a means of enhancing IC within the Project Environment</th>
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</thead>
<tbody>
<tr>
<td><strong>Transcription:</strong></td>
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<tr>
<td><strong>Interview 1</strong></td>
</tr>
<tr>
<td><strong>Interviewee:</strong> PM for PV solar renewable construction projects</td>
</tr>
<tr>
<td><strong>Date:</strong> 27/07/2015</td>
</tr>
</tbody>
</table>

## SECTION A: BIBLIOGRAPHIC INFORMATION

**Who are you, How long in Eskom and your role**

PM in Eskom. Worked for Eskom from 2006. Was heading design supervision for Ingula constructions Project. Currently the PM for PV technology renewable projects within Eskom.

## SECTION B: PROJECT MANAGER'S PERCEPTIONS ON KS

**View on Knowledge is power**

Yes, knowledge is power. It's acquired through time and experiences, as working through different projects or your career path.

**Understanding of KS in projects**

Getting experienced guys in specific field to give insight and their experiences. It does not mean it’s the true reflection, but just their experiences on the matter in question.

**Value of sharing knowledge within and between projects**

What I call Intellectual Property. Value is big in assisting project team members to have a different perspective on the project or impart their knowledge and everyone learns in the process, everyone start somewhere. That's how you acquire knowledge, e.g. sharing with your children; they will do what you do.

## Does KS improve PM Capability and competencies

KS plays a role in improving PM knowledge base and competencies. No organization without people, knowledge from the people makes the organisation to become competent, knowledge and competency goes together, no knowledge, no competency. The more knowledge, the more drive to learn and improve. There different specialities in PM, by nature competition becomes a drive. How would you describe SAPU's situation on KS as improving PM Knowledge base and competency? It is still a challenge, other projects have team cohesion while other do not have also victims of consultants known as experts. There is a clause in the contract that indicates that knowledge must be stored, but no one monitors it and ensure that consultants honour their contractual obligations. Also losing lot of knowledge from experienced SAPU guys, no proper shadowing, no database of experts and protect their knowledge.

## SECTION C: KNOWLEDGE SHARING CHALLENGES/BARRIERS

**Common KS Challenges/barriers in project environment**

No systems to capture knowledge or challenges as and when they happen, tend to capture only when there are problems, when things are running smoothly, no capturing. In projects, PM have not time to capture lessons learned, continuously solving problems, getting things done and focusing on deadlines. You need dedicated personnel to focus on that, if there is structure in place. Resource constraints its an issue, knowledge is only captured at specific given time, half of the time people leave the organisation without any knowledge sharing. HR exit interviews not capturing much, not in the right space and time, therefore not beneficial.

**Root causes Attributing factors to barriers/challenges**

## APPENDIX C: SCREENSHOT FOR CODING METHOD

<table>
<thead>
<tr>
<th>Iteration 1</th>
<th>Iteration 2</th>
<th>Iteration 3</th>
<th>Iteration 4</th>
<th>Iteration 5</th>
<th>Iteration 6</th>
<th>Iteration 7</th>
<th>Iteration 8</th>
<th>Average/Summary</th>
<th>Key Phrases/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st value in project</td>
<td>2nd value in project</td>
<td>3rd value in project</td>
<td>4th value in project</td>
<td>5th value in project</td>
<td>6th value in project</td>
<td>7th value in project</td>
<td>8th value in project</td>
<td></td>
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<tr>
<td>Core Intellectual Property. High Value in assigning teams to keep seniority for opportunities. Everyone stays in the process. Ideas of acquiring knowledge.</td>
<td>Better education, better alignment, better planning and improving performance which is key for the organisation.</td>
<td>Projects under scrutiny. Need to understand why what is happening in other project. Need to identify opportunities for improving future project. A challenge is that people are defensive and it is hard to support from the project evaluation team.</td>
<td>Extreme value. One project becomes worrisome of what is happening in other project. Need to identify opportunities for improving future project. A challenge is that people are defensive and it is hard to support from the project evaluation team.</td>
<td>Knowledge gained from project is used to improve the execution of future projects, eg, the core of PDI and RAL. Can improve planning, cost, schedule and quality. RAL save consultants at the same time, USD were achieved at reduced cost, time and improve quality as well as safety standards.</td>
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### Notes
- Projects under scrutiny. Need to understand why what is happening in other project. Need to identify opportunities for improving future project. A challenge is that people are defensive and it is hard to support from the project evaluation team.
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**Project objectives:**
- sustainably
- improve
- reduce cost
- save time
- improve quality
- safety standards

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**Key Phrases/Notes:**
- Projects under scrutiny. Need to understand why what is happening in other project. Need to identify opportunities for improving future project.
- Knowledge gained from project is used to improve the execution of future projects, eg, the core of PDI and RAL. Can improve planning, cost, schedule and quality. RAL save consultants at the same time, USD were achieved at reduced cost, time and improve quality as well as safety standards.

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**Average/Summary:**
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**University of Johannesburg**

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