EXPLORING THE EFFECTIVENESS OF KNOWLEDGE MANAGEMENT SYSTEMS IN RETENTION OF KNOWLEDGE AND DEVELOPING INNOVATIVE SERVICES- A CASE STUDY ON THREE LOGISTICS SERVICE PROVIDERS (REPUBLIC OF SOUTH AFRICA)

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Abstract

Knowledge has been marked as one of the key differentiators in establishing a sustainable competitive advantage in an increasingly competitive market place. Knowledge management is a paradigm that has developed from this, in order to ensure that organisations are aware of the benefits and challenges of managing organisational knowledge. With rapid advancement of technology systems have been developed to manage knowledge and are now known as knowledge management systems. The exploratory research aimed to determine what knowledge management systems are being used by logistics service providers, the influence and impact on knowledge retention and if a relationship exists between knowledge management systems and innovation. The research identified that enterprise wide knowledge management systems are being used but, knowledge retention strategies required more attention and that, a correlation exists between collaborative KMS and innovation strategies however further research is needed on a longitudinal scale and including qualitative research methodology. The study therefore, looks at these issues in some depth.

Introduction

South Africa has a lucrative import and export industry. This has given rise to more than 250 logistics service providers and has created an increasingly competitive market place. In order for logistic service providers (LSPs) to stay competitive in an industry that has transformed into a global market place, knowledge of import and export requirements, procedures and experience have become some of the key differentiators for a competitive advantage. With the pressure of increased global competition it has become imperative for South African LSPs to continually develop new and improved services as well as retain tacit knowledge. The resulted increase in competition has created a need for improved efficiencies and ever tighter margins (Doke, 2015:1). However this is becoming increasing difficult with a growing skills shortage Mail & Guardian (2015:1).

Aim of Study

The research study aimed to determine what factors influenced and impacted the retention of knowledge and if a relationship exists between KMS and innovation.
Objectives of the Study

- To determine the current systems being used for knowledge management (KM) in the three logistics organisations;
- To determine the factors that influence and impact the retention of knowledge in the three logistics organisations;
- To determine if a relationship exists between KMS and innovation in the three logistics organizations;
- To highlight where improvements might be needed; and
- To provide recommendations on how to improve current KMS.

Knowledge, Data and Information

Before understanding what KM is one has to understand what knowledge is. Knowledge can take on a variety of meanings based on the context it is used in. This difficulty arises from the relationship knowledge shares with two other important dimensions namely data and information (Frost, 2010:1). It is important to understand what knowledge versus data or information is. As defined by Myers (1996:2) knowledge is an innately human quality as an individual has to utilise the mind to indentify, interpret and internalise knowledge. According to McKenna (2008:1), as it is a cognitive process, only a human can create knowledge. Nikcols defines knowledge as having two basic definitions of interest, namely a defined body of information and secondly an individuals state of being in relation to a body of information (Barclay and Murray, 2000:2).

Davenport and Prusak define knowledge as a fluid mix of values, contextual information, framed experience and expert insight that creates a framework for incorporating and evaluating new experiences and information (as cited by Baskerville and Dulipovici, 2006:84). It exists in the minds of the individuals in the know. From an organisations perspective besides being saved in repositories and documents, it is also embedded in the processes, routines, practices and norms (Baskerville and Dulipovici, 2006:84).

![Figure 2.1 Differences between Data, Information and Knowledge](source: Frost, 2010:5)
As defined by Laudon and Laudon (2014:449) data is a flow of transactions recorded by an organisations systems but in itself is only useful for transacting. Data needs to be converted into useful information by the organisations resources such as daily, weekly and monthly sales reports. To transform information into knowledge the organisation has to utilise additional resources to discover patterns, rules and contexts where the knowledge works. Wisdom is knowing when and where to use the knowledge gained from the information the data provided (Grabara, Kolcun and Kot, 2014:2). Figure 2.1 details the differences between data, information and knowledge. Data is the first step in the pyramid of information DIKW hierarchy (D-Data;I-Information;K-Knowledge;W-Wisdom).

**Different Types of Knowledge**

In order to have effective KM it’s essential for organisations to be able to distinguish between the different types of knowledge and understand the different forms knowledge can exist in (Frost, 2010:10). There are two types of knowledge that are defined in KM and this is explicit and tacit knowledge. Explicit knowledge is defined as knowledge that can be expressed in numbers and words and can be shared in the form of data, scientific formulae and codified such as documents. Tacit knowledge refers to non-codified knowledge that is based on individual experience, personal and hard to formalise (Dalkir and Liebowitz, 2011:9). As noted by Edvinson and Malone (1997:10) tacit knowledge has two dimensions the technical dimension or know-how which is the hard to define skills and informal expertise. The second dimension is the cognitive dimension which consists of an individuals belief system, ideals and values. This dimension dictates how we perceive the world us. SECI model as developed and introduced by Nonka and Takeuchi explains four knowledge types that are used to create and share knowledge in an organisation by combining or converting the four types of knowledge (Nonaka, 2006:9). Figure 2.2 details the SECI Model.
As Kerr (2004) explains technology and the social aspect of knowledge must be included in the knowledge management design process (Mullins, 2010:189). Know-why or best practice, the know who and know how must be part of the process (Galliers and Leidner, 2009:15). Galliers and Leidner (2009:18) have observed that most organisations focus mainly on IT which is believed to create efficiency in organisations. Organisations generate enormous amounts of data that is not fully utilised to create useful information that can be turned into vital knowledge (Grabara, Koleun and Kot, 2014:2). Data in systems are only useful if captured correctly and this is still governed by a people element.

Knowledge Management

As observed by Mullins (2010:20) new approaches to management have been adopted by organisations. One of these shifting paradigms is how information and knowledge is managed. Knowledge is power and as such was held onto by individuals in organisations to maintain their positions. Organisations are evolving from hierarchal structures to more flexible flat structures, in order to stay competitive in a rapidly changing economic climate (Jones and George, 2011:306). With the increasing need for business competitiveness, rapid technology advancements and a twenty-four seven market place, organisations have to continuously innovate. KM has been defined in many ways one definition by Frost (2010:1) is that KM is the systematic management of an organisation's knowledge assets in order to create value and meet the organisations strategic goals. It involves the documentation of the organisations unique processes, learning and retention of knowledge to be used by the right people at the right time.

This includes the creation of new knowledge thus striving to establish a culture of learning in an organisation which promotes innovation. Knowledge and systems are interlinked, as knowledge that cannot be disseminated is useless. All though organisations have recognised that knowledge is an asset, it possess some radically characteristics in comparision to other assets (Dalkir, 2005:2). Knowledge can be used but never consumed, knowledge is not lost through transferral, there is an abundance of knowledge however the ability to use it is scarce and most of an organisations knowledge is embedded in its employees (Dalkir and Liebowitz, 2011:2).

The Importance of Knowledge Management

Mullins (2010:189) quotes Santosus and Surmacz who suggest that practically any business function can benefit from a creative approach to KM. It is important for organization’s to know how to retain vital knowledge, learn from the experiences of others and be able to use this knowledge to their advantage. Macintosh has indentified the following reasons as to why KM is important:

- Pressure to provide innovative products or services;
- Mergers and acquisitions create inter-organisational enterprises;
- The need for links to dispersed workforces;
- Increasingly complex products and services with significant knowledge components;
- Rapidly decreasing product life cycles and a twenty-four seven market place has created a hyper-competitive environment;
- The rapid advancement of technology; and
- Increasing rates of staff attrition, mobility, retirements and retrenchments raise concerns about knowledge loss (Baskerville and Dulipovici, 2006:3).

As noted by Dalkir and Liebowitz (2011:25) KM is important to communities, individuals and organisations and benefits all three tiers. KM benefits individuals by assisting them to perform better and more efficiently by promoting better decision making, creates opportunities to contribute in a challenging environment, promotes continuous learning and enhances organisational bonds. For community of practice KM develops professional skills, promotes mentoring, better collaboration between divisions, a common language and develops a code of ethics. For organisations KM creates opportunities innovation, releases embedded knowledge, builds organisational memory, helps drive strategy, enables the ability to remain competitive and diffuses best practice (Dalkir, 2005:20).
Difference between Information Management & Knowledge Management

Historically the terms information and knowledge have been interchangeable and as such not much progress has been made in information systems with regards to capturing tacit knowledge. Figure 2.3 info graph summarizes the difference between information and knowledge management.

![Figure 2.3 Information Management vs. Knowledge Management](image)

Source (Frost, 2010:15)

The logistics service industry needs both the tacit and explicit knowledge in order to be effective in their service execution. In an industry that is still governed by relationships it is the tacit knowledge that can be the differentiator to creating a competitive advantage and or response speed to market requirements. As noted by Jones and George (2011:556) as much as knowledge management systems allow employees to share their knowledge it does pose a problem in isolating an individual to a computer screen. It could also damage the work environment, as it stifles face to face communication which could affect creativity ultimately affecting organisation performance. According to Nonaka and Toyama (as citied by Kimmerle,Cress and Held, 2010:34) they believe only a small amount of knowledge exists as explicit knowledge, most is believed to be tacit knowledge.

Problems in Managing Knowledge

As noted by Mullins (2010:192) as much as recent literature encourages organisations to convert to learning organisations, the ability of any organisation to manage knowledge is not without its problems. As it states knowledge is power and it stands to reason that those individuals with this type of power would want to retain it as it gives them the feeling of security and control. The following challenges have been identified as stumbling blocks to establish organisation benefits (Mullins, 2010:192):

- Convincing employees to be part of the knowledge management strategy;
- Developing knowledge management around technology;
- Not linking organisation goals to the knowledge management strategy;
- Keeping the knowledge management strategy updated and relevant as it is not a static; and
- Organisations must be able to extract the relevant, quality knowledge and not just have quantity (Mullins, 2010:192).

It is crucial to understand the factors that influence the success of knowledge management and thus knowledge management systems. This will allow the enabling factors to be highlighted and used to improve the Organisation’s
performance (Theriou, Maditinos and Theriou, 2011:98). Logistics service providers should create an incentive for employees to be part of their KM strategies as in organisations that have adopted adaptive cultures employees are either given rewards for performance or are given opportunities to own a percentage of the company. This changes employees mindset as employees who are owners have an invested interest in the organisation performing well and therefore will have the required incentive to improve skills, processes and

**Types of Knowledge Management Systems**

Dalkir and Liebowitz (2011:233) state that the classification for KM technologies as tools that enhance and enable knowledge generation, codification and transfer. These tools generate knowledge, code knowledge to be widely available and transfer knowledge for speed. There are three major types of KMS as listed below:

1. Enterprise-wide KMS;
2. Knowledge work systems; and

Enterprise-wide knowledge management systems collect, store, distribute and apply digital content and knowledge. These systems allow organisations to search, store and locate employee expertise. Figure 2.5 gives an overview of enterprise-wide knowledge management systems (Laudon and Laudon, 2007:1). Knowledge work systems are more complex and are specialized systems built for knowledge workers such as engineers and scientists. Intelligent techniques include data mining, expert systems, neural networks these techniques have different objectives.

The research was aimed at determining which systems are being used by the three logistics service providers and what factors are influencing these systems and how effective are they in retaining knowledge and promoting innovation. When logistic service providers utilize the correct KMS the benefits are endless (Frost, 2010:70).

![Figure 2.5 Enterprise Wide Knowledge Management Systems](image)

Enterprise-wide knowledge management systems have three major categories namely; structured knowledge systems, semistructured knowledge systems and knowledge networks. Structured knowledge systems allows organisations to organise and store structured knowledge that exists in formal documents and achieve this by utilising databases and tools. These type of systems also support collaboration amongst organisation employees and external clients (Laudon and Laudon, 2007:1). Semistructured knowledge systems assist organisations in storing knowledge from non-formal sources such as e-mails or brochures. Both these systems are knowledge repositories. Knowledge network systems are focused on
Tacit knowledge and trying to convert this knowledge to explicit knowledge in order to sharing across databases. These systems generally hold information on who to contact with regards to expertise that might be required for particular problems. They also could hold case study’s dealing with issues that occur frequently providing solutions or recommendations (Laudon and Laudon, 2007:4). Hahn and Subramani (2000:4) introduced a framework for knowledge management support that details KMS into categories. Figure 2.6 summarises this framework. As they explain, the horizontal section of the framework places emphasis on the location of the organisational knowledge resources managed by the KMS. The vertical section emphasis the extent to which KMS requires or imposes a structure, a-priori. Cell one typically deals with information or data that can be codified, database management systems (DBMS) are used here in order to access data using a document categorisation scheme (Hahn and Subramani, 2000:4).

Cell two describes the instances where the knowledge resides in the individual and the KMS comprises of systems where the contents are managed by a-priori categorising schemes. An example is a database of experts. Cell three details instances where knowledge is captured in artifacts. KMS utilises documentary repositories which can be searched for using collaboratively filtering software. An example is an intranet. Cell four are instances where users can ask others for help in an online capacity (Hahn and Subramani, 2000:5).

Using Information Systems to Achieve Competitive Advantage

It has been noted that in almost every industry there will be some organisations that stand out as front runners (Laudon and Laudon, 2014:123). They seem to do better than others and are regarded as having a competitive advantage. Michael Porter’s competitive forces model is one of the most widely used models in understanding competitive advantage. This model is about the organisations general business environment and is based on five competitive forces that shape the fate of the organization. Figure 2.8 shows Porters Competitive Forces Model.

![Figure 2.6 Framework for Knowledge Management Support](image)

![Figure 2.8 Porter’s Competitive Forces Model](image)
Knowledge management systems allow organisations to gain insight into the five competitive forces. By using the information captured with regards to the organisation, suppliers and customers this can be turned into useful knowledge that can used to streamline internal and external processes and feedback obtained from customers can help the organisation create new innovate services (Xu and Quaddus, 2013:28).

The Importance of Innovation

Innovation is the process of developing new and improved products or services and is not an easy task for organisations (Jones and George, 2011:62). Managers have to be able to create an enviroment that encourages employees to innovate. Typically innovation occurs in groups or teams. As noted by Jones and George (2011:293) the rapid advancement of technology has been a significant factor in the attempts made by organisations to improve how their value chains innovate. It has been noted by Du Plessis (2007:1), that innovation is extremely dependant on knowledge, and with the current richness and amount of knowledge available it is imperative that the right knowledge is indentified and mananged for successful innovation.

Technological change has created two principle kinds of innovation namely Quantum product innovation and Incremental product innovation. Incremental innovation is improvement on existing services whereas Quantum innovation is developing new services (Du Plessis, 2007:3). Incremental innovation keeps the status quo in an organisation whereas Quantum innovation requires radical changes, new processes, learning and risk. One or both of these principles can utilised however it is has been observed that organisations utilising both are more successful (Du Plessis, 2007:3).

Research Methodology

Target Population

As defined by Wegner (2013:5) in statistics the population is the total sum of all possible data values that exists for the random variable under study. The target population consisted of all drivers, operations employees, administration staff and senior management. The target population was a combined total of 54 individuals, used in this study.

Limitations of the Research

The limitations to the research project were as follows:

- Time constraints have prevented this from being a mixed methodology study; and
- Limited to the three organisations participating in the study and their particular industry.
- As the subject matter of KM involves explicit and tacit knowledge, a mixed method methodology approach could have been utilised and should be used for any further research into KMS.
- Respondents informed consent;
- No harm to respondents;
- Confidentiality and Anonymity; and
- Permission to conduct the study view appendix A.

Results, Discussion and Interpretation of Findings

Response Rate

Thirty-two (94.11\%) individuals participated from a sample population of thirty-four. However four participants were eliminated due to incomplete responses. This is known as list wise deletion where incomplete responses are deleted in its entirety from the sample under study. This is a common method of handling missing data and has no bias if the missing values were randomly excluded (Young, Weckman and Holland, 2011:16). This left a total of twenty-eight respondents (82.35\%) used for the data analysis.

Analysis of Data

The results are categorized into five sections namely general information about the participants, knowledge environment, knowledge management systems, knowledge retention and knowledge and innovation.
**General Information**

![Figure 4.1 Gender](chart.png)

Of the participants involved in the study 64.3% were male versus the 35.7% who were female. From this it would seem that the LSPs are dominated by male employees however more in depth research is required to determine if this is a true reflection of the industry as a whole. It has been observed that women are better at collaboration and if the result of the case study has any bearing on the industry as a whole than efforts must be made to equalize the gender split. The logistics industry is noted for being a male dominated industry particularly in management positions (Isikli, 2015:1).

![Figure 4.2 Age](chart.png)

A combined total of 82.10% of participants are from the age group 18 to 44. The result reveals that the organisations have a diverse age group with knowledgeable and intermediary individuals. The data also reveals that the Organisation’s only have 17.9% of individuals who are close to retirement. This means that these organisations can still retain knowledge, experience and are young enough to be open to change as required. The data also reveals a healthy split between experienced individuals and intermediary staff as this should also promote succession planning, knowledge transfer and collaboration.
Current job level

A combined total of 67.9% of participants are middle to executive management level which reveals that all organisations should have very experienced staff who have knowledge that could be used to up skill intermediate and entry level staff. Three females from this result are middle management compared to 16 males in senior positions. As noted Swathi (2014:21) it is the human resource element in a business that provides its competitive advantage as they are able to convert other sources into services or products. With high levels of expertise in these organisations it should be a strategic plan to extract and document these expertise for use when required.

Years employed in Current position?

A combined total of 85.7% of participants have not worked for their respective organisations for more than 5 years. This reveals that all if not most of these organisations are new enterprises in this industry and are representative of SME (Sveinung et al., 2010:5). These organisations would be considered micro and small enterprises as their employee complement doesn’t exceed 50 staff members. Owners of SME are considered to be entrepreneurs (Gujrati, 2013:87).

Knowledge Environment

This section of the survey aimed to determine what the current knowledge environment was at the organisations. This data would assist in determining if the organisations promote KM and KMS in the work environment.
Groups and individuals routinely share information or expertise

Figure 4.5 Sharing of Information

Figure 4.5 displays results that when combined equate to 78.57% of participants agree and strongly agree that information and expertise are routinely shared among individuals and groups, 7.14% were unsure, 10.71% disagreed and 3.57% strongly disagreed. As noted by Jones and George (2011:311) it is important for organisations to develop a culture that promotes knowledge sharing as it creates opportunities for organisational learning and collaboration. As detailed in the framework of knowledge management support, developed by Hahn and Subramani (2000:4), collaborative filtering is part of the unstructured information in KMS. Pearson (2009:5) also advises that one of the benefits of collaboration is innovation.

Specific individuals identify, collect, classify, summaries and disseminate organisational knowledge

Figure 4.6 Organisational Knowledge

Figure 4.6 displays results that when combined equate to 85.71% of participants agree and strongly agree that organisational knowledge is handled by specific individuals, 10.71% were unsure and 3.57% disagree. As Mullins
(2010:192) noted it is not easy to manage knowledge and there are problems that organisations experience in trying to create and manage KMS. These organisations have assigned KM to a specific individual who is responsible for organisational knowledge, thus ensuring that it is not an afterthought but a strategic objective. By doing this the organisations have prepared for KR which as Frost (2010:20) advises is an important task for Organisation’s, as vital knowledge could be lost through staff attrition, retirements and retrenchments.

When employees are given the task of searching for information they able to fulfill the request

![Figure 4.7 Searching for Information](image)

Figure 4.7 Searching for Information

Figure 4.7 displays results that when combined equate to 71.43% of participants who agreed and strongly agreed that employees are able to search for information successfully, 14.29% were unsure and the same percentage disagreed. This result infers that information could easily be retrieved from its structured or unstructured repositories. As defined by McKenna (2008:2) KMS allows for information to be retrieved when required in the format required in order to make informed decisions. These systems subsequently improve operations. Dalkir and Liebowitz (2011:233) explain knowledge tools allow for knowledge to be codified, generated and transferred speedily as required.

Your organisation provides electronic (e.g. intranet) and paper based tools which direct employees to available resources

![Figure 4.8 Tools](image)

Figure 4.8 Tools
Figure 4.8 displays results that when combined equate to 82.14% agreed and strongly agreed that their organisations provide electronic and paper based tools in order to inform employees of available resources, 3.57% were unsure, 7.14% disagreed and 7.14% strongly disagreed. As Laudon and Laudon (2014:451) explained KMS is part of the knowledge management value chain which consists of information system Activities and management and organisational activities. Dissemination is one aspect of the information system activities and intranets are systems that allow for the dissemination of information. This is an important aspect, as advised by Grabara, Kolcun and Kot (2014:2), in an information age where organisations generate enormous amounts of data it is important that this data is disseminated or easily accessible in order to create useful information to extract vital knowledge.

**Knowledge Management Systems**

This section focused on the research question to determine what KMS are being used by the organisations participating in the study.

**Your organisation views information technology as a tool to help you get your work done**

<table>
<thead>
<tr>
<th>Attitudinal Scale</th>
<th>Strongly Disagree (19)</th>
<th>Disagree (2)</th>
<th>Unsure (1)</th>
<th>Agree (4)</th>
<th>Strongly Agree (5)</th>
<th>Total</th>
<th>Weighted Average</th>
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<tbody>
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<td></td>
<td>8.80%</td>
<td>3.57%</td>
<td>7.14%</td>
<td>50.89%</td>
<td>39.23%</td>
<td>28</td>
<td>4.25</td>
</tr>
</tbody>
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![Figure 4.9 IT](image)

Figure 4.9 displays results that when combined equate to 89.29% of participants agreed and strongly agreed that their organisation views IT as a tool used by employees to get their work done, 7.14% were unsure and 3.57% disagreed. As observed by Galliers and Leidner (2009:18) IT has been the focus of most organisations in order to create efficiency, speed and the ability to handle large volumes without having to increase overhead. However this should not be confused with KM as historically the two terms have been interchangeable whereby organisations believe if they have an IT system this constitutes having KMS. As Frost (2010:15) summarised there are clear distinctions between information management and KM and this should be the same for IT systems and KMS. It is important that IT is used to not only assist with explicit knowledge but also with tacit knowledge. As cited by Kimmerle, Cress and Held (2010:34), Nonaka and Toyama believe that most of an organisation’s valuable knowledge is tacit and that new technologies have emerged to support tacit knowledge documentation and retention.
Your organisation has established ways for employees to document and share information

Figure 4.10 Document and share information

Figure 4.10 displays results that when combined equate to 92.86% of participants agreed and strongly agreed that their organisation has created ways for them to document and share their information, 3.57% were unsure and 3.57% strongly disagreed. As noted by Pearson (2009:3) it has become very important for organisations to share and document information as this promotes a collaborative organisation culture. Enterprise-wide knowledge management systems assist in collecting, storing and distributing knowledge and are only of the three major KMS (Frost, 2010:70).

Your organisations IT systems connect employees to information sources that assist them complete tasks

Figure 4.11 Assistance in task completion

Figure 4.11 displays results that when combined equate to 82.14% of participants who agree and strongly agree that their organisations IT systems allow them to retrieve information that assist them complete their tasks, 14.29% were unsure and 3.57% disagreed. Saade, Nebebe and Mak (2011:36) cited that even though the utilisation and creation of knowledge is based on the individual the managing of the knowledge created is heavily dependent on IS or IT. KMS
provides organisations with the ability to access information at the right time and place in order to make informed decisions, IS supports this requirement.

*The electronic and physical places where your organisation stores its knowledge, contain the best information available on a wide range of critical topics*

Figure 4.12 Best Information

Figure 4.12 displays results that when combined equate to 53.83% of participants agreed and strongly agreed that their organisation stored knowledge that was the best and most critical on a wide range of topics, 35.71% were unsure and 10.71% disagreed. As stated by Laudon and Laudon (2013:77) those organisations that perform better than others due to the unique knowledge they possess should isolate what the unique knowledge is and leverage it for strategic benefit. It is important for organisations to record best practices and continually improve on these.

*It is easy to retrieve documents from their physical or electronic storage spaces*

Figure 4.13 Retrieval of Documents

Figure 4.13 displays results that when combined equate to 71.43% of participants have agreed and strongly agreed that it is easy to retrieve documents from their storage spaces, 10.71% were unsure, 14.29% disagreed and 3.57% strongly disagreed. As Hahn and Subramani (2000:3) have explained the locus of knowledge determines how KMS will direct the
individual to obtain the knowledge required. Enterprise-wide systems allow for easy retrieval of structured and unstructured documents as they have databases and tools that allow for search engines in order to retrieve documents quickly (Laudon and Laudon, 2007:2). It is important for KM that documents are easily retrievable and what is retrieved is useful (Babu, Harshavardhan and Kumar, 2012:212).

Training on new systems focuses on how these technologies can be used to improve the quality and efficiency of how employees work

![Figure 4.14 Training on new Technologies](image)

Figure 4.14 Training on new Technologies

Figure 4.14 displays results that when combined equate to 89.29% of participants agreed and strongly agreed that when their organisations provide training on new systems emphasis is placed on how these technologies will benefit the employees, 3.57% were unsure, 3.57% disagreed and 3.57% strongly disagreed. KM and subsequently KMS is not without implementation challenges, it is important that organisations are aware of these challenges and address them for effective implementation (Theriou, Maditinos and Theriou, 2011:98). One of these challenges is convincing employees to contribute and be part of the KM strategy and that technology enhances their work experience (Mullins, 2010:192).

Knowledge Retention

The section focused on determining what KR processes where utilised by the organisations.

Before employees are retrenched your organisation tries to determine if their skills or expertise can be used elsewhere

![Figure 4.15 Retrenchment](image)

Figure 4.15 Retrenchment
Figure 4.15 results show that 42.86% of participants are unsure if their organisation would try to retain an employee’s skills by placing them in a different area of the organisation before retrenchment is considered, 14.29% of participants disagreed and 42.86% agreed that their organisation would try to retain their expertise before considering retrenchment. KR has been established as one of the critical factors that contribute to maintaining organisational performance and in order for KR to be successful it is important that knowledge is recorded and shared and is part of human resource practices (Frost, 2010:26).

**Employees who leave your organisation are given the opportunity to document their tacit (stored in their head) knowledge**

![Figure 4.16 Tacit knowledge](image)

Figure 4.16 results show 50% of participants are unsure if their organisations allows employees who are leaving to document their tacit knowledge, 17.86% of participants disagreed, 3.57% strongly disagreed and 28.57% agreed that their organisations allowed for departing employees to document their tacit knowledge. KR is important for organisations as in the eventuality that an employee decides to leave they could have lost valuable knowledge that has provided them with an advantage (Doan, Rosenthal-Sabroux and Grundstein, 2015:1). As previously noted by Nonaka and Toyama most knowledge is believed to be tacit and as also noted by Dalkir and Liebowitz (2011:2) most of an organisations knowledge is embedded in its employees.

**Your organisation supports group activities that promote mutual learning**

![Figure 4.17 Group Activities](image)
Figure 4.17 displays results that when combined equate to 60.71% of participants agreed and strongly agreed that their organisations support group activities that promote mutual learning, 21.43% of participants were unsure, 14.29% disagreed and 3.57% strongly disagreed. One of the pillars of KR is bidirectional knowledge flow which means that knowledge is passed from the top down and from bottom up (Liebowitz, 2008:27). Organisations who support this type of learning and knowledge flow will promote a culture of continuous learning which will assist in ensuring the viability and longevity of the organisations.

Knowledge sharing is built into your performance appraisal system

Figure 4.18 Knowledge sharing and performance appraisal

Figure 4.18 displays results that show 32.14% of participants are unsure if knowledge sharing is built into their performance appraisal systems, combined total of 21.43% participants disagreed and strongly disagreed, 42.86% agreed and 3.57% strongly agreed. Liebowitz (2008:26) describes a recognition and reward structure as one of the four key pillars of KR. Organisations who make KR part of employees performance appraisal systems, are utilizing the recognition and monetary benefits associated with performance appraisal systems, to motivate employees to share their knowledge (Liebowitz, 2008:27). Individual’s hold on to knowledge as power and need a reason to let that power go.

Knowledge and Innovation

The last section of the survey focused innovation and KM to determine if a relationship exists between these variables.

Your organisation often involves customers to create new, innovative services

Figure 4.19 Innovate Services
Figure 4.19 displays results that when combined equate to 64.29% of participants agreed and strongly agreed that their organisations involved customers to create new innovative services, 14.29% were unsure, 14.29% disagreed and 7.14% strongly disagreed. As Jones and George (2011:293) observed the desire for organisations to have first mover advantage over competitors has created a need for rapid innovation. As such strategies have involved including customers and suppliers in developing new innovative services or products (Jones and George, 2011:294). As part of Porters competitive forces model in order gain a competitive advantage it is important to look at the five competitive forces that shape the fate of organisations. One of these forces is customers who can provide organisations with feedback (Thompson, Strickland, Peteraf, Janes, Gamble and Sutton, 2012:65).

**Your organisation gives all promising ideas thorough consideration, no matter who it comes from**

![Figure 4.20 Ideas](image)

Figure 4.20 displays results that when combined equate to 78.57% of participants agreed and strongly agreed that their organisation gives all promising ideas thorough consideration, no matter who it comes from, 14.29% were unsure and 3.57% disagreed and strongly disagreed. The best ideas can come from the most unlikely place and it is important that organisations create a culture of collaboration and teamwork. As Pearson (2009:5) states one of the benefits of collaboration is innovation as it allows for individuals to bounce ideas off each other. When organisations allow for ideas to be submitted from all individuals they are also encouraging a free flow of ideas which encourages a culture shift to more teamwork and can lead to innovation (Quast, 2012:1).

**Employees apply the ideas they have developed in past work situations to their current work**

![Figure 4.21 Application of previous knowledge](image)
Figure 4.21 displays results that when combined equate to 89.29% of participants agreed and strongly agreed that employees in their organisation apply ideas they have learnt in past work situations to their current work, 7.14% were unsure and 3.57% disagreed. Organisations that have acquired employees from suppliers, customers and competitors have also acquired their knowledge and therefore have gained insight into Porters competitive forces which allow organisations to determine the forces affecting industry profitability (Thompson, et al., 2012:64). As Xu and Quaddus (2013:28) have noted by analyzing the five competitive forces knowledge can be gained to create innovative services or products.

Your organisation developed a framework that links knowledge management activities to strategic outcomes

![Image](knowledge_management_linked_to_strategic_outcomes.png)

Figure 4.22 Knowledge management linked to Strategic outcomes

Figure 4.22 displays results that when combined equate to 64.28% of participants agreed and strongly agreed that their organisation links knowledge management activities to strategic outcomes, 25% were unsure, 7.14% disagreed and 3.57% strongly disagreed. Innovation is dependent on an organisation’s ability to extract rich information that can be utilised to make strategic decisions (Du Plessis, 2007:1). Good strategy and good strategy execution equates to a top performing organisation and this can only be achieved by making sure the strategy passes three tests (Thompson et al., 2012:12). The three tests are the fit test, the competitive advantage test and the performance test which all require knowledge and information to determine if the organisation can complete the required strategic objectives (Thompson et al., 2012:13).

Pronbach’s Coefficient Alpha

Cronbach’s co-efficient alpha is used to test reliability. Case details as displayed in table 4.1 were used to arrive at Cronbach’s Alpha of 0.863 as displayed in table 4.2. All calculations were done using SPSS.

Table 4.1 Research Case Details

<table>
<thead>
<tr>
<th>Case Processing Summary</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases Valid</td>
<td>28</td>
<td>100.0</td>
</tr>
<tr>
<td>Excluded*</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100.0</td>
</tr>
</tbody>
</table>

* Listwise deletion based on all variables in the procedure.
The result displayed in Table 4.2 indicates that the survey questionnaire has a good degree of reliability and the items in the survey questionnaire have a good inter-item consistency.

**Spearman Rank Correlation Coefficient Test**

One of the objectives of the study was to determine if a relationship exists between KMS and innovation. The Spearman rank correlation coefficient test was used to determine this as the analyses was based on ordinal data from the five point likert scale survey. As likert survey’s are non-pramatic this method was chosen. The limitation of Spearman rank correlation coefficient test is that it is limited to linear relationships. The test was run using SPSS and results are displayed in table 4.3, which shows a linear relationship between knowledge sharing and creating innovation through involvement of customers.

**Table 4.3 Spearman’s Rank Correlation Coefficient Test**

<table>
<thead>
<tr>
<th>Correlations</th>
<th>Q5</th>
<th>Q19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spearman's rho</td>
<td>1.000</td>
<td>.404</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.</td>
<td>.033</td>
</tr>
<tr>
<td>N</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>Q19</td>
<td>Correlation Coefficient</td>
<td>.404</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.033</td>
<td>.</td>
</tr>
<tr>
<td>N</td>
<td>28</td>
<td>28</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed).

A relationship exists between variables if the value of Sig. < 0.05. No correlation exists between the variables if the value of Sig. > 0.05. As the correlation result is <0.05 this could be interpreted that a relationship exits between the two variables.

**Conclusions and Recommendations**

**Findings from the Study**

**Findings from the Literature Review:**

- It is important to define what knowledge is and then to determine what knowledge is important to the organisations. As noted knowledge is a human attribute and therefore can only be created by human intervention (McKenna, 2008:1) (Barclay and Murray, 2000:2).
- Knowledge shares a relationship with data and information, it is raw data that is turned into information and the information that is analysed to create knowledge. It is the individuals experience that provides the wisdom in knowing what information is important to extract vital knowledge (Grabara et al., 2014:2).
- In developing effective KMS it is important for organisations to understand that knowledge exists in two spheres namely tacit and explicit knowledge (Frost, 2010:10). Where tacit knowledge is the human element existing in
individuals, their experience and individual expertise. This element is noted for being hard to formalise. Whilst explicit knowledge can codified, expressed in numbers, words and shared as data (Dalkir and Liebowitz, 2011:9).

- According to Laudon and Laudon (2014:450) knowledge is a complex concept and has some important dimensions namely that it is a firm asset, it is available in different forms, knowledge has a location and that knowledge is situational. It is important that organisations not only focus on the generation of data through IT but also utilise the data generated to create useful information that can be turned into vital knowledge (Grabara et al., 2014:2). IT creates efficiency but individuals create knowledge.

- Due to a rapidly changing global economy, creating ever increasing competitive markets, knowledge has been identified as one of the key differentiators for organisations to establish a competitive advantage (Frost, 2010:1) (Jones and George, 2011:306).

- KM is important as it allows organisations to manage their knowledge assets and utilise these to create new innovative products and meet organisation strategic goals. However it is not an easy concept to implement and as noted more knowledge is tacit embedded in individuals (Dalkir and Liebowitz, 2011:2). As noted by Baskerville and Dulipovici (2006:3) with increasing rates of staff attrition, mobility, retirements and retrenchments knowledge loss is possible.

- IM and KM have been regarded as interchangeable concepts however this is not the case and it’s important for organisations to understand the differences between these concepts as one covers the dimensions of data and information and the other covers knowledge (Frost, 2010:15).

- Organisational knowledge from all levels is important and KMS has to be able to store, retrieve and disseminate this knowledge (Dalkir, 2005:3).

- Management support in creating adaptive organisations cultures will support KMS as it is believed that individuals who work in these strong cohesive cultures go above and beyond to ensure their organisations perform well (Jones and George, 2011:331). Technologies have developed around promoting these types of organisational culture shifts where team work, collaboration, knowledge sharing and organisational learning are believed to improve productivity, quality, customer service, increase revenues and promote innovation (Pearson, 2009:5) (Kimmerle et al., 2010:33).

- KMS is utilised by organisations in order to better manage processes for capturing, applying and managing knowledge expertise (Laudon and Laudon 2013:77). The system is meant to provide the user with information required at the time required in the format required to make informed decision (McKenna, 2008:2).

- According to Laudon and Laudon (2014:453) there are three major types of KMS namely enterprise wide systems, knowledge work systems and intelligent techniques. Each one is used based on the Organisation’s specific requirements.

- KR is an important component of KM and KMS, as noted by Doan et al. (2015:1) it can give organisations a competitive advantage by reducing costs and sustaining organisational performance. It is important to retain critical knowledge that supports decision making processes (Doan et al., 2015:2).

- Innovation, as noted by Du Plessis (2007:1), is heavily dependant on knowledge, however as Jones and George (2011:62) have advised this not an easy task for organisations. It has been observed that innovation occurs in groups or teams.

- There are three main drivers for utilizing KM and KMS for innovation. The first is to utilize knowledge and collaboration to create, build and maintain a competitive advantage. The second is an organisations ability to extract relevant information as and when required to make informed decisions and not hold unnecessary excess information. The drive is to ensure the knowledge is easily accessible (Du Plessis, 2007:4). IS can be used as a competitive strategy as it allows for automation and telecommunication networks provide easy access for collaboration (Xu and Quaddus, 2013:29).

Findings from the Primary Research:

- In the research study 64.3% were male versus the 35.7% who were female. This result shows that the industry could still be very male dominated especially in management positions. On further analyses the research result showed that only 3 females are in middle management positions versus 9 male counterparts.

- Of the participants in the study 82.10% were from 18 to 44. With 75% participants in the 25 to 44 age group. This reflects a good age dispersion in the organisations and diversity which should have knowledgeable and experienced individuals to impart knowledge to their staff.
• Of the participants in the study 67.9% were middle to executive management which displays a top heavy hierarchy but this could also be due to the fact the organisations are SME’s.

• Of the participants in the study 85.7% have not worked for their respective organisations for more than 5 years. This result corroborates that these are fairly new SME’s in the industry possibly started by experts in the industry.

• What KMS are being used by the organisations? Based on questions five to fourteen it was determined that 50% and above agreed that IT tools were in place to assist employees with document retrieval, sharing knowledge and assistance in completing daily tasks. The results also revealed that above 75% agreed that training was provided on any new systems implemented with emphasis on how these systems could assist them. From the results the first research question has been adequately answered.

• The research results showed that, with regards to the knowledge environment, an average over the four questions covering this area was 79.46%. This meant that participants agreed or strongly agreed that their organisations routinely shared information or expertise, their organisations provides tools to direct employees to available resources, they are able to effectively search for information as required and that specific individuals were identified to manage organisational knowledge.

• The KMS section of the survey results revealed that 89.29% of participants felt their organisations viewed IT as a tool to enhance work, 92.86% believe their organisations has created ways for them share and document information, 82.14% felt it was easy to retrieve information when required and 71.43% felt it was to retrieve documents. Only 53.83% felt their organisations stored knowledge that was the best and most critical covering a wide range of topics. 89.29% of participants felt that their organisations provided training and emphasis on how technology would benefit the individual and the organisations.

• What factors influence or impact KR? The KR section of the survey results displayed that before staff leave due to either retrenchment or other reasons 42.86% to 50% of participants were unsure if their organisations had any process to either redeploy or document the employee’s tacit knowledge before they left. 60.71% felt their organisations supports group learning activities. 32.14% were unsure if knowledge sharing was part of their appraisal systems and 46.43% agreed or strongly agreed that it was. The factors that influence KR are information and communication tools, HR practice’s, incentives, management support, learning cultures and KR strategies. Based on the results communication between employees and HR policies and procedures are lacking as significant percentage were unsure of their organisations KR strategies or what impact a retrenchment or staff member leaving would have KR.

• Is there a relationship between KMS and Innovation? The knowledge and innovation section revealed that 64.29% believed their organisations involved customers in creating new, innovate services. 78.57% believed their organisations would give all promising ideas through consideration. 89.29% agreed that employees at their organisations apply ideas from previous work environments to the current environment. 64.28% agreed and strongly agreed that their organisations had developed a framework that linked knowledge management activities to strategic outcomes. Even though the organisations seem to be employing factors to promote innovation the research study was not conclusive in establishing a causal relationship between KMS and Innovation. Study on determined a correlation relationship and thus further research is required.

Conclusions

The following were the first three objectives of the research study and research questions to be answered:

• To determine the current systems being used for knowledge management (KM) in the three logistics organisations;

• To determine the factors that influence and impact the retention of knowledge in the three logistics organisations; and

• To determine if a relationship exists between KMS and innovation in the three logistics organizations.

In order to meet these objectives of the study the following conclusions have resulted from the research study:

• Based on responses received from the knowledge environment and KMS section of the survey the organisations are perceived to be utilizing types of enterprise wide knowledge management systems. These systems incorporate structured and unstructured forms of tacit and explicit knowledge storing, creation and dissemination.
The KR section of the survey revealed that the human resource element of KR is lacking as quite a few individuals were unsure of their organisations processes with regards to KR. Even though there seems to be specific individuals responsible for KM and IT to support knowledge sharing and documentation there doesn’t seem to be a KR specific strategy.

The knowledge innovation section of the survey provided the required data to determine if a relationship exists between innovation and KMS. The test applied was the Spearman rank correlation coefficient due to the data available. Though this test showed a possible relationship it is not conclusive and an indepth study is required incorporating qualitative and quantitative research methods.

**Recommendations**

**KR Strategy:** The organisations should relook at their KR processes and procedures and ensure that the individual’s responsible for daily knowledge management also has a process for KR. This also has to be documented with their human resource department to ensure employees are aware of the procedures associated with the KR strategy. The organisations need to provide management support for these strategies and keep the process and procedures relevant and updated.

**Best Practice KM:** The organisations need to ensure that the knowledge stored and disseminated is best practice and that this is continuously monitored and improved. KM is not a once off update or creation, it is an ongoing process of review and update to ensure the information and knowledge are best practices. Organisations must continue to improve, collaborate and innovate.

**Linking KM to Strategic Organisation Goals:** It is important for these organisations to not only implement the technology to improve work processes and create efficiency, but to also take into the account how these applications and the unique business knowledge fit together to work harmoniously. KM should be part of their strategic business objectives and not an afterthought. Creating a learning, integrated organisational structure will promote KM strategy.

**Area’s for further Research**

**Innovation and KMS:** A longitudinal study is required on the effects of KMS on innovation in LSP in the SME sector. A more in-depth investigation needs to be done than achieved by this study. As knowledge is a human cognitive element it is important that a qualitative study is done in conjunction with the quantitative study with more probing questions, interviews and a before and after analysis of data.

**KR:** The KR strategy and HR communication to employees, needs to be investigated to determine if any form of KR strategy is been planned and communicated in organisations.

**Gender equality in Logistics Industry:** An in-depth study should be done on a more extensive sample of SME in the logistics industry to determine if the industry is still male dominated or if this is shifting.

**Conclusion**

The results of the primary study assisted in answering the research questions and achieve the objectives for this exploratory study on KMS in SME LSP in Johannesburg. The study concluded that the organisations are utilizing enterprise wide knowledge management systems in order to create collaboration, storing and sharing of information. Sharing knowledge and collaboration initiatives are said to promote innovation. A correlation test between collaboration and innovation was performed that resulted in a positive result for a relationship between these variables however more investigation is required as knowledge is a cognitive function and therefore qualitative research is also required. KR was an area that needed some attention as a significant amount of participants was unsure of their company’s policies on KR. The organisations also need to ensure that best practice knowledge is recorded and kept relevant as this is what could give them a competitive advantage.
References


