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Knowledge in modern organisations: establishing the link between knowledge management, organisational learning, environmental dynamism and innovation : (a comparative study of mobile companies in Zimbabwe and South Africa)

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Master`s research by dissertation submitted by:

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Knowledge in modern organisations: Establishing the link between knowledge management, organisational learning, environmental dynamism and innovation

(A comparative study of mobile companies in Zimbabwe and South Africa)

A research dissertation submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, Johannesburg, in fulfillment of the requirements for award of the degree of Master of Commerce (Management) in the School of Economic and Business Sciences.

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Abstract

Knowledge Management has become a key fundamental asset for any organisation`s productivity gains, i.e. product or service innovation. But it does not work in isolation; aspects such as Organisational Learning have proved to be important too as organisations aim to have their employees well equipped with the internal and external environment. That being said, organisations operate in a dynamic environment that keeps changing all the time in terms of technology, financial markets, customer buying-behaviour, amongst other factors. As such, mobile organisations are innovation bound in terms of their products and services that they offer; hence, innovation is their main priority. This research study examines the link that exists between knowledge management, organisational learning, environmental dynamism towards achieving innovation amongst mobile organisations, Organisation A and Organisational B, in Zimbabwe and South Africa respectively. This research study will hypothesize and test knowledge management, organisational learning and environmental dynamism against innovation across the two organisations with a total sample of 370. The results highlight knowledge management, organisational learning and environmental dynamism as positively correlated and there is a statistical significant relationship between knowledge management, organisational learning and environmental dynamism towards innovation. The results also indicated that ED plays a moderating role in regulating how innovative organisations can be with organisations in high unstable environments having high innovation levels. The major implication that will be a limitation for this research study is that the data collected is limited to organisations in South Africa and Zimbabwe only. The practical implications for this research study will aim to contribute to management of organisations to utilise and illustrate that knowledge management, organisational learning and environmental dynamism form part of the bottom line of the organisation towards achieving innovation levels. This research study aims to contribute to the literature that exists on knowledge management, organisational learning, and environmental dynamism by empirically analysing their effects on innovation. It also highlights the interaction and link that exists between knowledge management, organisational learning and environmental dynamism and how these facets work hand in hand to attain innovation levels in organisations that will make them competitive over their rivals.

Declaration

I, Tinashe Masoka, do hereby declare that this research dissertation is the result of my investigation and research and that this has not been submitted in part or full for any degree to any other University.

T. Masoka

Date

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List of Acronyms

Knowledge Management Capabilities	–	KMCs
Organisational Learning	–	OL
Environmental Dynamism	–	ED
Explicit Knowledge	–	EK
Tacit Knowledge	–	TK
Organisation A	–	Zimbabwe
Organisation B	–	South Africa

Chapter 1: Introduction

1.1 Introduction

The present research focuses on establishing whether there is a link between knowledge management, organisational learning, environmental dynamism and innovation in the modern organisations of today. The focus will be on mobile organisations considered to be the biggest in Zimbabwe and South Africa, namely Organisation A and Organisation B. This chapter will explore all four variables for this research in much more detail as the chapters unfold.

1.2 Background of study

Various well-known researchers and authors notably (Davenport & Prusak, 2000; Grant, 1996; Hedge & Shapira, 2007; Nonaka & Takeuchi 1995; Tanriverdi, 2005; Yayavaram & Chen, 2015) have defined and explained Knowledge Management extensively. There is literature on Knowledge Management aspects that researchers have studied but a few have linked the relationship or link that exists between KMC, Organisational Learning, and Innovation in the organisation. Since we are now living in a global village which is characterised by high levels of technology, research, and development, innovation that rapidly changes and increases over time, Knowledge and facets of Knowledge Management in an organisation have become so extremely important that its absence should never be underestimated (Meihami & Meihami, 2013). According to the Economist Intelligence Unit (2006), Knowledge Management contributes close to 45% of productivity gains in organisations of today globally, therefore highlighting the importance of Knowledge Management in organisations. Nevertheless, do Knowledge Management, Environmental Dynamism and Organisational Learning have an impact on the Innovation levels and success of mobile organisations?

As time progressed over the last two decades, organisations in the mobile industry became aware of the power and impact of knowledge as the most valuable resource in the knowledge society hence knowledge management became widely recognized as crucial for the success or failure of organisations (Wu & Chen, 2014). Knowledge Management as a specific field of study and enterprise has occurred very rapidly within the space of a decade up to now (Wu & Chen, 2014). Modern society is increasingly becoming a “knowledge society”; hence, the

aspect of *innovation* always evolves as an important component in organisations in the mobile industry (Nonaka, 1994; Yayavaram & Chen, 2015).

With the increasing importance of knowledge in this globalised and technological economy, business organisations particularly mobile companies that operate in knowledge-intensive sectors, must leverage knowledge as an organisational asset in order to achieve innovation levels (Meihami & Meihami, 2013). Hence, the key question posed today is no-longer whether to manage knowledge, but how to manage knowledge effectively in a way that produces results for organisations and also how knowledge affects innovation in mobile organisations of today (Yayavaram & Chen, 2015). Does knowledge management lead to high innovation levels in organisations? Are mobile organisations of today managing knowledge effectively to be innovative? What strategies have mobile organisations come up with to manage knowledge and attain innovation levels in this ever-changing economic, political, social, technological environment? As the research unfolds, all these aspects will be highlighted in detail later on.

Earliest mentions of Knowledge Management appeared roughly in the mid 1990s and up to date it has developed at an incredible pace, with various notable researchers coming up with different angles of knowledge management, namely (Davenport & Prusak, 2000; Grant, 1996; Hedge & Shapira, 2007; Nonaka, 1994; Tanriverdi, 2005; Yayavaram & Chen, 2015). The facilities which help an organisation to use knowledge effectively and attain innovation levels effectively include knowledge acquisition, knowledge dissemination and knowledge application i.e. responsiveness to knowledge, were termed ‘‘Knowledge Management Capabilities’’ (KMC). Wu and Chen (2014) highlighted that KMCs were highly related with innovation performance of an organisation. Hence, it will be inadequate to discuss the link that exists between KMC and Innovation without mentioning the role played Organizational Learning (OL) and the moderating role of Environmental Dynamism (ED), in the organisation as a whole (Wu & Chen, 2014). Previous studies on knowledge management by (King, 2009; OuYang, 2014; Schilke, 2014), have highlighted OL as a pivotal role that improves an organisation`s KMCs. High OL traits provide for better internal and external synchronization on all management levels. Hence, it puts in place an efficient teamwork, enabling organisations to quickly harness and use new knowledge to their advantage (Zhao et al., 2013). In addition, ED is the moderator that plays a pivotal role in the relationship between KMC, OL, and Innovation (Zhao et al., 2013).

1.3 Definition of terms

1.3.1 Knowledge Management

One of the definitions comes from Bock, Zmud, Kim, and Lee (2000) who identifies knowledge management as the approach to manage knowledge from different people and processes of an organisation. Different organisations usually capture and codify tangible and intangible knowledge as tacit or explicit knowledge (Bock et al., 2005). Bock et al. (2005) highlighted that knowledge sharing should not be forced but rather facilitated amongst the different age groups in the organisation for it to be effective.

Another definition defines knowledge management as the "promotion and formalisation of learning within the workplace, aimed at linking training with the needs of the business" (Thompson & Mchugh, 2009, p.233). Hence, greater flexibility in work systems has given rise to a shift away from inflexible specialisation practices (Thompson & Mchugh, 2009). Knowledge is an important asset for any organisation as it causes the smooth progress of gentle qualities of the new economy such as the use of networks, creativity and a shift from control and hierarchies (Thompson & Mchugh, 2009).

1.3.2 Organisational learning

Another key aspect in the organisation is Organisational Learning. Spender (2008) acknowledges that organisational learning is the process of creating, retaining and transferring knowledge within the organisation hence an organisation will improve over time as it gains experience. From this experience, it is able to create knowledge that will help the organization achieve its short-term and long-term goals (Zhao et al., 2013). As a result, Wu and Chen (2014) highlight that organisational learning is the accomplishment of best practices throughout the entire organisation that will lead to the organisation achieving its innovation levels.

1.3.3 Environmental Dynamism

According to Jansen, Vera and Crossan (2009), Environmental Dynamism is the rate of change and instability in the external environment that will, affect the whole organisation in a negative way. Such uncertainty in the external environment be it economically, politically or socially, will force the organisation to respond to the need for change, to predict consumers' wants and needs and explore new options, (Gonza´lez-Benito, Aguinis, Boyd & Sua´rez-

Gonza´lez, 2012.).

1.3.4 Innovation

The last aspect that will need a brief introduction is Innovation. Skillicorn (2016) identifies innovation as the process of turning a product or service into a solution that offers distinct value from a customer`s perspective. Coming up with ideas is relatively easy and fast but the challenge then comes to executing those ideas into meeting the exact needs of the customer leading to innovation taking place (Skillicorn, 2016). Greenwald (2014) simply defines innovation as staying relevant. The external environment that we are in now is of huge unprecedented change therefore if organisations, in this case, mobile organisations, need to survive and be successful they need to adapt and to evolve to meet customer`s needs and wants (Greenwald, 2014). An example that comes to mind is Apple; the organisation has managed to be relevant over a period of time when it comes to their products in terms of design, material, product features, customer touch points by taking into account the ever-changing external environment and customer needs and wants thus resulting in the organisation being successful for so long. Furthermore, Palacios, Gil, and Garrigos (2009) argue that innovation is the process of taking new ideas to satisfied, existing or new, customers and converting new knowledge into products and services that will give the organisation an edge over their main rivals. This, in turn, will create a competitive advantage for an organisation amongst its other competitors in the market (Sirmon, Hitt, Ireland & Gilbert, 2011). Knowledge Management has fast become a popular and a very important aspect in organisations of today (Chen, Kao & Chen, 2009). Literature has highlighted Knowledge management and Organisational Learning as key attributes to success that leads to innovation and competitive advantage in organisations (Thompson & Mchugh, 2009).

1.4 Problem Statement

This research explores the effects of knowledge management on innovation in mobile organisations of today. The whole purpose of carrying out this research is because of the research gap concerning an African perspective between two countries, i.e. (Zimbabwe and South Africa). Most studies (Casanueva, Castro & Galán, 2013; Connell & Voola, 2013; Gnyawali, & Srivastava, 2013) have highlighted the direct influence of KMCs on innovation and how organisational learning plays a crucial role but moderating variables such as environmental dynamism have been neglected (Wu & Chen, 2014). Because of the research gap that exists regarding moderating variables such as environmental dynamism, this research will seek to explore that gap.

Subsequently, this research will examine the relationship that exists between knowledge management, organisational learning and innovation in the mobile industry whilst incorporating the moderating variable of environmental dynamism. The outcome of this research will help contribute to the discussion of whether knowledge management with the help of organisational learning leads to innovation in this constant ever-changing external environment between Organisation A and Organisation B.

1.5 The aim of the study

The purpose of this research is to compare between two mobile giants in Zimbabwe and in South Africa so as to examine the relationship that exists between knowledge management, organisational learning and innovation in the mobile industry whilst incorporating the moderating variable of environmental dynamism. The reason for choosing these two mobile organisations is mainly that they have huge network coverage in their respective countries and other operations in Africa. Hence, this research will outline the aspect of knowledge management; how they manage knowledge from different people in order to harness innovation; how they come up with innovative ideas to stay competitive in this ever-changing external environment since they operate in different environments amongst other aspects.

1.6 Research Objectives

As stated by Wagner, Kawulich, and Garner (2012), research objectives should draw attention to the main objective of carrying out the research study. The research objectives are as follows:

- ✓ To analyse the relationship between knowledge management capabilities and innovation.
- ✓ To evaluate the relationship between organisational learning and innovation.
- ✓ To investigate whether the impact of KMC on innovation is moderated by environmental dynamism.
- ✓ To investigate whether the impact of organisational learning on innovation is moderated by environmental dynamism.
- ✓ To analyse if there is a statistically significant difference across network providers from the two economies based on environmental dynamism.

1.7 Empirical Research Questions

Research questions will now be formulated since the research objectives have been identified.

The answers to the research questions ensure that our research objectives have been achieved and that they are in line with research questions. The specific questions of this research consequently are as follows:

- ✓ Is there a relationship between knowledge management capabilities and innovation?
- ✓ Is there a relationship between organisational learning and innovation?
- ✓ How is the impact of KMC on innovation moderated by environmental dynamism?
- ✓ How is the impact of organisational learning on innovation moderated by environmental dynamism?
- ✓ Is there a statistically significant difference across network providers from the two economies based on environmental dynamism?

1.8 Theoretical Overview

Managing knowledge in this ever-changing world we are in at the moment, poses a huge problem for organisations especially now that we have different people from different age groups, cultures, ethnicities amongst other factors, from all over the world working in organisations (Thompson & McHugh, 2009). Given the identified problem of managing an intellectual aspect such as knowledge in a constant changing environment, this research aims to contribute to the gap that exists in literature. This will be done by incorporating the rare moderating effect of environmental dynamism to expand the knowledge base associated with how knowledge management and organisational learning have an effect on innovation between the two mobile organisations. Knowledge Management theory by Nonaka, 1994 will be the main theory that will be used to establish whether there is a link between knowledge management, organisational learning, environmental dynamism and innovation in this research study. For the purpose of this research, the focus will be mainly on one moderating variable, i.e. environmental dynamism (ED) in an African context since most studies on this topic have been done mainly in the European and Western mainstream. The question then is; does the effect of knowledge management, environmental dynamism, and organisational learning affect innovation in a positive way? Specifically, which knowledge management strategies assist organisations in capturing existing intellectual capital and sharing knowledge within an organisation? This research will examine knowledge management, environmental dynamism, and organisational learning to determine their impact on innovation levels in the two mobile organisations.

1.9 Significance and Contribution of study

This research will have a positive contribution to the knowledge of organisations in the mobile industry especially for the two mobile organisations in South Africa and Zimbabwe, in terms of how to achieve innovation. The comparison of the two countries will help analyse how mobile organisations in different working environments, i.e. socially, economically, politically, handle their KMCs together with organisational learning in order to attain innovation that will make these organisations attain competitive advantage in the market, especially over their main rivals as well. The reason for choosing these two countries is mainly because of their distinct environments that they operate in.

Zimbabwe is a developing country that has been negatively affected in terms of its economy hence affecting industries such as the telecommunications industry (Chulu, 2013). According to Mataranyika (2018), the environment in Zimbabwe has not been stable economically, politically and socially for the last 10-15 years. The unstable economic environment is marred by major issues such as fuel shortages which have led to sharp increases in prices. The lack of foreign currency has affected majority of the sectors in the country, hindering most organisations to import raw materials for production (Chulu, 2013). Some organisations have either closed or pulled out of the country due to delays in payments for crucial imports (Gambanga, 2016). This forex (foreign currency) crunch is negatively affecting all industries in Zimbabwe including majority of parastatals which are heavily in debt leading to major of accruing more interest charges on the current debt. Furthermore, Mutisi (2017) insists that some investors and big organisations are pulling out of the country due to lack of security and assurances from the government as inflation is on the rise, which is currently above 4% and experts say this will even go higher. Over the past decade or so, politically as well, the country has not been stable enough to attract major investors to invest in the country and develop the economic hence adversely affecting the growth and stability of most organisations in the country (Mataranyika, 2018). For the purposes of this research, Organisation A in Zimbabwe will be the main focus. Organisation A has approximately over 2 500 employees that operate in Zimbabwe thus highlighting the growth of the company (Chulu, 2013). As a result of the above mentioned factors, things tend to change rapidly that organisations are forced to re-invent themselves so that they stay relevant. This unpredictable environment forces organisations in the telecommunications industry in Zimbabwe to be innovative all the time. This will help the organisations to counter the ever-changing environment in order to remain successful hence their innovation levels tend to be vigorous.

This research will help analyse whether Zimbabwean organisations are innovative or not in this ever-changing environment that it operates in.

South Africa on the other hand has a fairly stable environment which has been consistent for a long time in terms of stability (van Wyk, 2016). The country has seen major developments taking place in terms of technological advancements over the past decade or so and this has boosted the economy to some extent. As alluded to by van Wyk, (2016), such kind of environment encourages businesses to grow and also allows telecommunication organisations to be innovative as well. Hence organisations in this working conducive environment benefit more in terms of consistency and survival in the long-run. As a result, this study will help analyse whether telecommunication organisations in South Africa are innovative or not in this ever-changing environment that they operate in. For the purposes of this research, the focus will only be on Organisation B in South Africa. Organisation B is one of the biggest telecommunication organisations in South Africa and it has approximately over 7 500 employees thus highlighting the growth of the company (Mochiko, 2017). These ever changing environmental forces organisations in the telecommunications sector in South Africa to be innovative all the time so that they counter the dynamic environment in order to remain successful hence their innovation levels tend to be robust. This research will help analyse whether South African organisations are innovative or not in this ever-changing environment that it operates in.

Hence, the outcomes of this research will help provide mobile organisations with information on how to manage their KMCs in this ever-changing global environment and on how to effectively manage organisational learning in order to attain innovation levels.

1.10 The format of the study

This study will take the following steps until its completion:

Chapter 1: Overview of the research

This section covers the brief background, problem statement, aims, research objectives, and questions and lastly significance of the research.

Chapter 2: Literature review

In this chapter the literature review, theoretical grounding of the research and empirical literature will be discussed.

Chapter 3: Research Methodology

Research design, measuring instruments, data collection methods, and statistical analysis make up this chapter.

Chapter 4: Data analysis

The collected data will be analysed using a statistical package named SPSS

Chapter 5: Discussions and Conclusions

Findings, managerial implications, limitations, and recommendations of study make up this chapter.

1.11 Conclusion

Based on the above introduction to this research, the main aim of this research is to establish a link that exists between knowledge management, organisational learning, environmental dynamism and innovation in Zimbabwe and South African organisations. The above introductory explanation regarding the basis of this whole study, will give a platform from various literatures to be explored together with the existing literature from Zimbabwe and South Africa. The next chapter reviews the literature that is available for this research.

Chapter 2: Literature review

2.1 Introduction

This chapter will highlight the different components concerning the effects of knowledge management, organisational learning and environmental dynamism on innovation in organisations in Zimbabwe and in South Africa. The main aim of this research is to examine whether knowledge management and organisational learning have an impact on innovation and to see if the moderating effect of environmental dynamism affects innovation. Knowledge management theories will also be examined together with the types of knowledge. Organisational Learning and Environmental Dynamism will give an insight into how environmental changes and learning traits influence innovation. Lastly, an overall conclusion concerning previous studies will summarise this chapter.

Knowledge Management has fast become a popular and very important aspect in organisations of today (Chen, Kao & Chen, 2009). According to, Potgietera, Adamovic, and Mearns (2012), the overabundance of significant literature has served to diminish the significance of Knowledge Management, Environmental Dynamism, Organisational Learning, and Innovation to the point that these highly important concepts have little distinct meaning. Even though the role of Knowledge Management in the organisation has been widely noted for a long time, the absence of an inter-relationship theory between Knowledge Management, Environmental Dynamism and Organisational Learning in order to attain innovation levels on the topic has been grieved over in the literature. Hence, there have been calls for more attention to be addressed if the relationship between these three aspects lead to success or not, or even if it exists at all (Potgietera et al., 2012). Thus, this research seeks to explore if this inter-relationship exists at all in an African setting since most studies have been done in a European environment. As highlighted by Thompson and McHugh (2009), ever since the introduction of the computer combined with the amount of information available, knowledge has been playing a huge part for most organisations. In a world encircled by the ever-changing technological advancements and the changing workforce demographics, organisations that fail to embrace and share knowledge find themselves in trouble (Tubigi & Alshawi, 2015).

Knowledge is a fundamental key to maintaining and gaining competitive advantage (Thompson & McHugh (2009). According to King (2009), the direct influence of (KMC) on innovation, performance and contextual or moderating variable such as environmental dynamism have been rare. King (2009) later alluded that organisational learning and environmental dynamism contribute more by improving an organisation`s KMC in terms of greater teamwork, openness, flatter organisational structures and this, in turn, will lead to greater levels of innovation being attained. A couple of researches (Anderson, Potocˇnik & Zhou, 2014; Cho & Korte, 2014; Molina-Castillo & Munuera-Aleman, 2009) have investigated the factors that affect innovation levels since innovation has become an important aspect for most organisations globally. This is to retain and maintain competitive advantage and guarantee long-term survival in the competitive global markets (Kamasak, Yavuz & Altuntas, 2016). Previous researches by (Cho & Korte, 2014; Heidl & Wadhwa, 2012; Palacios et al., 2009; Phelps, Wu & Chen, 2014) highlighted that there is a positive relationship between knowledge management capabilities (KMC) and innovation. Previous researches investigating the effects of moderating variables such as environmental dynamism (ED), have not been examined on this relationship, thus highlighting a gap in literature for this aspect to be explored fully (Anderson et al., 2014; Kamasak et al., 2016 & Sirmon et al., 2011). Andreeva and Kianto (2012) also posit that there is a lack of studies that examined the various inter-relations of different knowledge management practices in relation to the organisation's innovation levels. Therefore, this research will seek to explore that gap that exists in literature.

2.2 Knowledge Management and Innovation relationship

The relationship between Knowledge Management and Innovation is very crucial to the sustainability of organisations of today in-terms of achieving high success levels (Baskerville & Dulipovici, 2006). As stated by the Economist Intelligence Unit (2006) since we live in one global village, it is ideal to establish a relationship between Knowledge Management and Innovation in an organisation. On the other hand, developing an effective way to manage knowledge whilst simultaneously seeking to have learning capabilities in this constantly ever-changing environment seem to be an obstacle for organisations in Zimbabwe and South Africa.

Innovation is mainly attained because of knowledge elements in the organisation since knowledge is an important ingredient for innovation, (Kamasak et al., 2016). Studies by (Wu, & Chen, 2014; Tubigi & Alshawi, 2015; Kamasak et al., 2016) on innovation have highlighted that the knowledge in an organisation is linked with high levels of innovation that will give the organisation an edge over its rivals. Globalisation has created new challenges for organisations to be innovative and competitive in the market. Therefore, organisations have to face high competition from their rivals which has led to the growth of knowledge management aspects. As a result, organisations are now motivated to move on from other management practices to focus on knowledge management, (Cho & Korte, 2014; Tubigi & Alshawi, 2015). However, on the other hand, Easterby-Smith and Prieto (2008) argue that it is crucial to separate knowledge resources from managing knowledge as these two entities are separate. Although knowledge, as an asset, can be treated in a delicate and valuable manner, knowledge itself is a static resource which needs to be carefully transferred and spread throughout the organisation in a way that will create value and competitive advantage, (Easterby-Smith & Prieto, 2008). Hence, competitive advantage is attained by converting static knowledge into a more applicable and practical nature of knowledge in the organisation (e.g. from tacit to explicit knowledge). Knowledge as a whole is managed and coordinated through important processes; knowledge creation/acquisition, knowledge dissemination and knowledge application, namely KMCs.

2.2.1 Knowledge creation/acquisition

This includes the acquiring of knowledge from internal and external sources (such as employees, customers, suppliers, and competitors) and converting the knowledge in a more practical manner, which will be beneficial to the organisation's knowledge storage (Cho & Korte, 2014).

2.2.2 Knowledge dissemination

Knowledge dissemination is the distribution and allocation of knowledge in the organisation at all levels of management, from top to bottom, (Wu & Chen, 2014).

2.2.3 Knowledge application

It is the interpretation and restructuring of knowledge in a strategic way of embedding organisational abilities and making sure those organisational outcomes such as changes in buyer behaviour, new product developments, innovation improvement, operational efficiency, broad external relationships and changes in positive competitive environment, will sustain the organisation in a competitive way (Cho & Korte, 2014).

Appropriate use of KMC practices enables organisations to be on the lookout for organisational knowledge hence in the process creating new knowledge, facilitating the transfer and transformation of this knowledge to all organisational levels as well as helping the organisation to develop competencies that will result in high innovation levels (Wu & Chen, 2014).

The close relationship between knowledge management and innovation according to several researchers (Easterby-Smith & Prieto 2008; Palacios et al. 2009; Cho & Korte, 2014; Yayavaram and Chen 2015) state that organisations who are creative and innovation-related are highly associated with KMC practices. The research of Palacios et al., (2009) highlighted a positive relationship between KMCs and innovation and entrepreneurship performance of organisations. In recent researches, (Karimi & Javanmard, 2014; Yayavaram & Chen, 2015) examined the relationship between KMC and Innovation. The research by Karimi and Javanmard (2014) on German organisations revealed that effective use of KMCs led to a positive impact on Innovation. Similarly, U.S. firms that were listed in databases from 1976 to 2004, Yayavaram and Chen (2015) found that effective KMCs had a positive effect on innovation levels, as the organisations could be flexible with their knowledge base leading to the incorporation of new and existing knowledge thus leading to high innovation levels. According to Liu and Deng (2015), investigating on the relationship between knowledge management and innovation is very important as the results assist organisations to further investigate the consequences of knowledge management.

As stated by Kamasak et al., (2016), organisations are able to be flexible with their knowledge base and combine both new and existing knowledge in order to attain innovation levels that they require. Knowledge is a key ingredient for innovation to take place hence competitive advantage is likely to be achieved once knowledge is converted from tacit to explicit knowledge (Wu & Chen, 2014). Studies by (Karimi & Javanmard, 2014; Yayavaram & Chen, 2015) have indicated the positive relationship that exists between KMC and Innovation. Hence, the above literature deduces the following hypothesis:

H1: KMC is positively related to Innovation

2.3 Organisational learning (OL) and Innovation relationship

It will be inadequate to discuss the relationship between knowledge and innovation without focusing on the role played by organisational learning.

According to Alegre and Chiva (2008), organisational learning is the process of acquiring, distributing and creating information and knowledge among organisational members to improve innovation levels and performance. Organisational Learning is further described as a set of activities within the organisation that enables the learning of all its members, from internal and external sources (Kamasak et al., 2016).

The research in the organisational learning filed by Alegre and Chiva (2008) recommend five important elements that characterise organisational learning, namely: openness and experimentation; risk-taking; interaction with the external environment; dialogue and teamwork; and participative decision making. Openness and experimentation refer to how new ideas and suggestions are brought forward and dealt with considerately, whilst risk-taking is more related to tolerating uncertainty and errors (Tubigi & Alshawi, 2015). The relationship that an organisation maintains with its immediate environment is better known as interaction with the external environment (Alegre & Chiva, 2008), and dialogue and teamwork refer to the collective effort that increases communication and allows people to see the true meaning of what is being conveyed by the message. The last dimension of organisational learning is participative decision making which refers to how employees participate in the decision-making process (Tubigi & Alshawi, 2015).

In essence, OL in organisations will be based on the above-mentioned five dimensions. In literature, OL facilitates KMC resulting in higher innovation levels by the organisation (King, 2009; Wu & Chen, 2014). Innovation implies ‘‘the generation and implementation of new ideas, processes or products’’ (Alegre & Chiva; p.2008) and new ideas can be created through KMC that include the processes of acquisition, dissemination, and application of new knowledge. OL dimensions, openness, and experimentation together with dialogue and teamwork enlighten individuals to a greater variety of broad ideas and increase internal group coordination (Garriga, von Krogh & Spaeth, 2013).

Collective decision-making also helps increase commitment to learning amongst individual members and encourages members in the organisation to develop new ideas hence improving innovation levels (Alegre & Chiva, 2008). Knowledge is seen as an important success factor for enhancing organisational learning that will be make them have that competitive advantage over other organisations (Liu & Deng, 2015).

On the other hand, knowledge can be easily obsolete and useless if not utilised properly within the organisation (Liu & Deng, 2015). As a result, it is very crucial for an organisation to develop favourable environment and learning procedures that will enhance their knowledge management principles as big asset (OuYang, 2014).

Additionally, according to (Garriga et al., 2013; OuYang, 2014; Kamasak et al., 2016), risk-taking is also very important for the generation of new ideas and therefore should be encouraged within the organisation. As a result, the generation and application of new knowledge and ideas are mainly stimulated within the internal learning processes in the organisation. External learning that encourages the interaction with the external environment also plays a huge role in affecting the innovation levels in the organisation as well (Alegre & Chiva, 2008). Establishing alliances, networking and technology transfers, R&D partnership with tertiary and research institutes will help organisations to obtain new knowledge and ideas.

As stated by Garriga et al., (2013), knowledge that is acquired needs to be well organised, integrated and used effectively by everyone in the organisation in order for it to be useful and successful. Hence, OL helps organisations generate and develop new ideas and knowledge that will continuously improve their innovation levels and performance of the organisations as a whole (OuYang, 2014).

Therefore, as highlighted from the above literature on OL, OL plays a significant role in ensuring high innovation levels. Do telecommunication organisations in Zimbabwe and South Africa have OL traits in their respective organisations that allow ideas and knowledge to be generated from their pool of talent? This will be identified in chapter 4 when results and findings will be discussed in detail. Organisational learning can be conceptualised as the ability of an organisation to learn from both the internal and external environment by means of openness, dialogue, teamwork, interaction with the external environment and participative decision-making (Kamasak et al., 2016). Therefore organisational learning helps organisations to generate new knowledge and ideas so as to keep improving innovation levels thus as result having a direct relationship with innovation (Kamasak et al., 2016).

Hence, the above literature deduces the following hypothesis:

H2: Organisational learning is positively related to Innovation.

2.4 Moderating effect of Environmental Dynamism on KMC and Innovation

From the above literature concerning the relationship between knowledge management, organisational learning, and innovation, there is clear evidence that the relationship exists in a positive way. Hence, the moderating effect of *environmental dynamism* is examined further to see if there it affects positively to organisation attaining high innovation levels. Environmental dynamism refers to the rate of change, volatility, and instability of the external environment (Kamasak et al., 2016). When environments are highly dynamic for some time, uncertainty may hinder an organisation's ability to be pro-active, to predict customer needs/wants and to explore new alternatives, (Gonza´lez-Benito et al., 2012). However, on the other hand, studies by (Ambrosini & Bowman, 2009; Schilke, 2014) argue that organisations in harsh and turbulent environments have a great opportunity to strengthen their existing capabilities or better yet develop new ones which enable organisations to be innovative and counter the challenges in a positive way. In line with this, early literature from (Kamasak et al., 2016) suggests that organisations that operate in uncertain environments are inclined to develop better KMCs, which promote the creation of new, situation-specific knowledge and improve creative thinking that leads to superior innovation levels.

According to Karimi and Javanmard, (2014) when an environment is constantly changing with time, organisations must use existing knowledge base at their disposal as effectively as possible to develop their KMCs. This is done through cross-functional networking and intensive communication in order to attain innovation levels that will give the organisation an edge over their rivals (Ambrosini & Bowman, 2009; Karimi & Javanmard, 2014; Yayavaram & Chen, 2015). In Turkey, for example, financial markets operate high uncertain environments, leading to most of the banks in the country developing strategies like in-house knowledge management software, which assisted customers and employees to have electronic brainstorming sessions by linking the web-portals and other social media tools. As a result of these brainstorming sessions, several innovative ideas such as credit cards offering customers to make their payments in monthly installments and hi-tech ATM machines that enable customers to withdraw and/or deposit gold bullions to their accounts were generated successfully, (Kamasak et al., 2016). This example from Turkey clearly highlights how organisations in volatile and uncertain environments can be pro-active and innovative at the same time but this only happens when better KMCs are in place.

Further practical examples that highlight the success of emerging market organisations operating in harsh uncertain environments are Tata of India; Lenovo and Huawei of China; Embraer of Brazil and Lukoil of Russia. As shown by the studies of (Kamasak et al., 2016 & Ramamurti, 2012), these organisations did not only benefit from their low-cost advantages but they also had the capacity to generate and integrate their immense skills and ability of evaluating the market needs (e.g. when to change product ranges or when to accelerate product offers through their effective KMCs).

Yayavaram and Chen (2015) continue to argue that organisations in unstable environments tend to develop better effective KMCs, which ultimately lead to new knowledge and innovative thinking that will make sure higher innovation levels are achieved. Previous studies in (Kamasak et al., 2016) e.g. (Hoskisson, Eden, Lau & Wright, 2000; Jansen, Van den Bosch & Volberda, 2006; Liu, Jiang, Zhang & Zhao, 2013) indicate that organisations in emerging markets, operate in highly fluctuating business environments which lead to different variations of KMCs being developed, hence high innovation levels are attained. Hence, if an organisation is operating in an environment that is always changing or that is emerging and unpredictable, the KMCs and innovation levels are higher as well. Key examples of these emerging markets include Tata of India; Lenovo and Huawei of China; Embraer of Brazil and Lukoil of Russia (Kamasak et al., 2016).

Hence, the above literature deduces the following hypothesis:

H3: Environmental Dynamism moderates the relationship between KMC and Innovation such that organisations in high volatile uncertain environments develop better efficient KMCs to counter the problems they will be facing in their environments than those in less volatile uncertain environments.

2.5 Moderating effect of Environmental Dynamism on OL and Innovation

In high unstable environments, organisations tend to prioritise resources, leading to emerging market organisations having to deal with a variety of market segments together with rapid customer buying-behaviour that may emerge because of conflicting income distribution and low education levels of consumers (Li & Liu, 2014). Prior research by (Liu et al., 2013; Park & Ryu, 2015) shows that emerging market organisations operating in unstable business environments, where high ED is frequent, have acquired different and better OL traits compared to developed country firms.

Failure to have better KMCs in place has resulted in organisations, even in developed countries, suffering huge losses immensely. A practical example is that of Marks and Spencer (M&S) which was, for a long time, a successful organisation but suffered a huge setback when its profits and market share plummeted in the 1990s (Ambrosini & Bowman, 2009). This happened because of the organisation lacking an understanding of its clientele, local and worldwide changing fashion trends and consumer shifting needs that were evolving together with the external environment at large. The organisation had been accustomed to an image of old-fashioned classical British brand of clothing only, neglecting other and upcoming brands. In response to this huge setback, the organisation recognised and developed new systems of collecting and collating new and old knowledge in and out of the organisation that significantly improved the OL of the organisation immensely. M&S has forged new ways to develop and understand customer and supplier needs, which enabled new customer products to be introduced. As a reactive measure to do damage control, the organisation offered innovative product range, which includes machine washable wool tailoring and suits for men, non-iron cotton clothing, non-polish shoes and sensitive skin clothing for children. Consequentially to developing effective OL traits in learning the external environment and the needs of their clients, M&S`s product range was awarded ‘‘Product of the Year status; becoming the first company to win such a prestigious award in the UK (Kamasak et al., 2016).

This example of Marks and Spencer clearly highlights the crucial role played by having effective OL in place, which will lead to superior innovation levels. However, in the case of high environmental dynamism, organisations with effective OL traits in place make understand how to operate in difficult unstable environments, hence, these organisations are in a better place to be innovative and be successful over their competitors.

Yayavaram and Chen (2015) further argue that organisations in highly uncertain environments have better organisational learning attributes, which then promote superior innovation levels. Studies by (Garriga et al., 2013; Park & Ryu, 2015) suggests that as environmental uncertainty arises, organisations need to learn and understand more about the environment hence by learning more about the external environment, organisations with higher organisational learning traits will be in a better position to develop better innovation levels (Kamasak et al., 2016).

Hence, the above literature deduces the following hypothesis:

H4: Environmental Dynamism moderates the relationship between Organisational Learning and Innovation such that organisations in high volatile uncertain environments develop better OL attributes to counter the problems they will be facing in their environments than those in less volatile uncertain environments.

2.6 Conceptual framework and hypotheses of the study

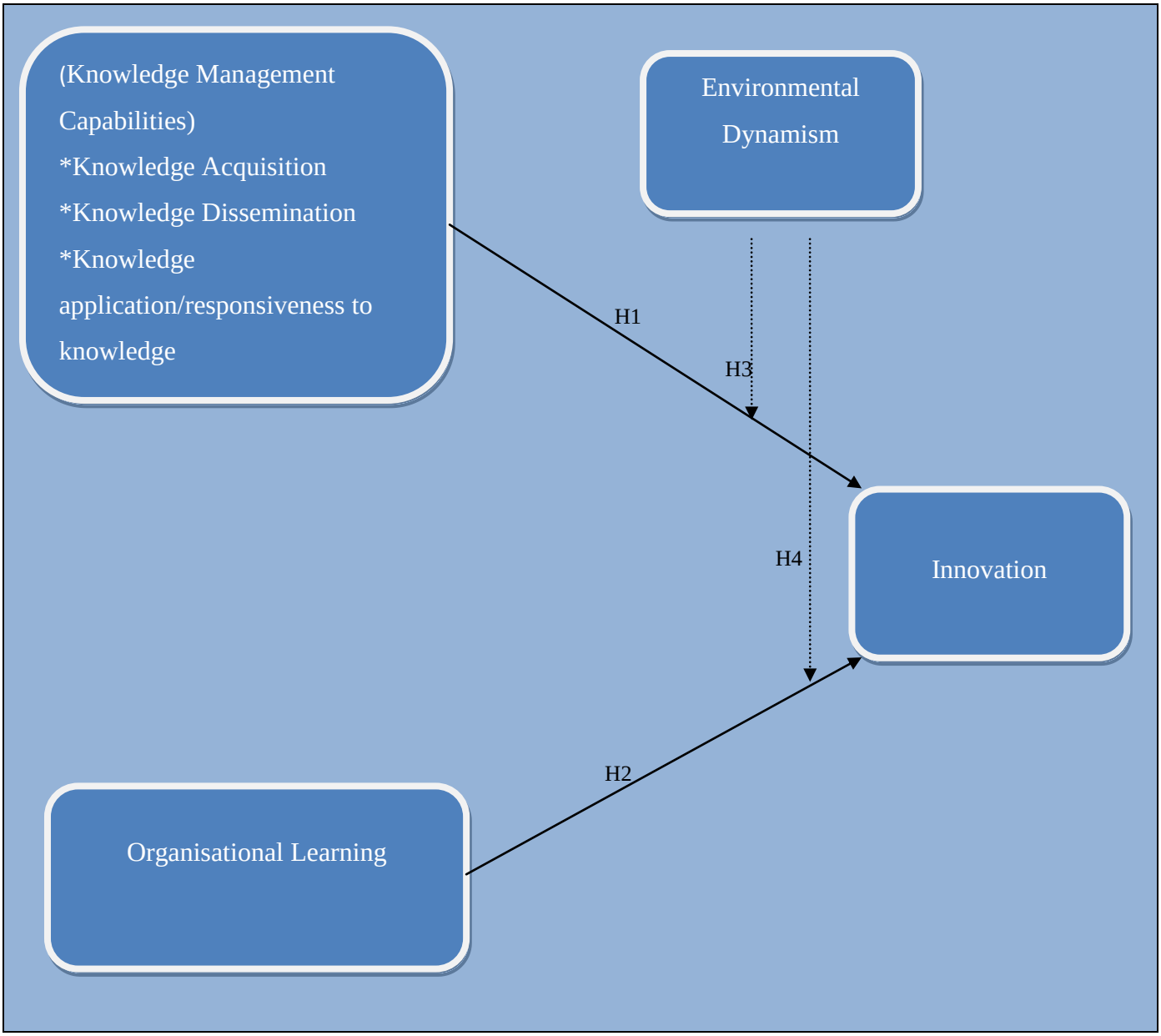


Figure 2.1 Conceptual framework

From the above literature and formulated hypotheses, the figure above displays the proposed conceptual model involving the relationship linked to the variables of this research.

Below are the formulated hypotheses:

H1: *KMC is positively related to Innovation*

H2: *Organisational learning is positively related to Innovation*

H3: *Environmental Dynamism moderates the relationship between KMC and Innovation such that organisations in high volatile uncertain environments develop better efficient KMCs to counter the problems they will be facing in their environments than those in less volatile uncertain environments.*

H4: *Environmental Dynamism moderates the relationship between Organisational Learning and Innovation such that organisations in high volatile uncertain environments develop better OL attributes to counter the problems they will be facing in their environments than those in less volatile uncertain environments.*

2.7 Knowledge Management Theory

Nonaka (1994) is one of the well-known authors of knowledge management and his contribution to knowledge management is immense as identified from the various literature at hand. According to Nonaka and Takeuchi (1995), organisational longevity and competitive advantage depend greatly on how well organisations operate in a global post-capital economic environment. Traditionally, the typical organisational approach would be merely to process information and solve problems. But this approach, Nonaka (1994) maintains, is a passive and static view of the organisation where "information processing is viewed as a problem-solving activity which centres on what is given to the organisation – without due consideration of what is created by it" (Nonaka, 1994; p. 14). Hence, a globally competitive organisation would need to be one that is not averse to change – particularly with regard to product design and capability. This is where innovation (a necessary part of organisational learning) intersects with organisational knowledge creation (Nonaka & Takeuchi, 1995). Moreover, the importance of having knowledge management systems in place for organisations will depend on the flexibility of the organisations to be alert and proactive to the ever-changing external environment (Alavi & Leidner, 2001; Dalkir, 2013; Nonaka & Takeuchi, 1995).

Authors such as (Demarest; 1997; Wiig, 1993) advance their view that the creation of knowledge is an inevitable part of the daily operations of an organisation. However, the issue is not how knowledge is created or not but the test of the effectiveness of a knowledge management system of whether the company views knowledge as a "fortuitous by-product of its operations….rather than an explicit objective of those operations (Demarest, 1997; p. 377). Such a company would fail because "not because it could not construct knowledge but because it could not deliver the knowledge created to the marketplace in terms of market-valued performances" (Demarest, 1997; p. 377).

To prevent knowledge management systems from being perceived as a soft function which merely supports the corporate culture, it is up to knowledge workers; knowledge managers and ultimately corporate leadership to manage and drive knowledge assets in such a way that they significantly business economic indicators (Wiig, 1993). A vital aspect of understanding the role of knowledge management systems in organisations and society is the 'people'/ 'individual' aspect. This is alluded to in Nonaka and Huber (in Alavi & Leidner, 2001; p. 4) definition of knowledge:

"Knowledge is a justified personal belief that increases an individual's capacity to take effective action".

The above description emphasises the role of individuals and their commitment to the knowledge creation process. Essentially, it is the individual that is at the centre of the distinction between *information* and *knowledge* because *information* is "data interpreted into a meaningful framework" (Alavi & Leidner, 2001; p. 5) whereas *knowledge* is interpreted and actionable based on the commitment and beliefs of its holder. Therefore, due to the personalised nature of knowledge, in order for it to be useful to an organisation, knowledge management necessarily becomes a systemic and organisationally specified process of identifying, gathering and codifying tacit and explicit knowledge of employees for the benefit of the entire organisation (Alavi & Leidner, 2001; Dalkir, 2013).

Nonaka (1994) alludes that knowledge management initiatives or efforts generally aim to have control of information processing thus intellectual capital is crucial to Western information processing where knowledge is formal and systematic, characterised by:

- ✓ Hard data
- ✓ Codified procedures
- ✓ Universal principles

2.7.1 Two major types of Knowledge: Tacit and Explicit

In order for knowledge management to be effective in the organisation, the organisation needs to allow knowledge sharing to take place across all various levels and departments. Knowledge sharing refers to the provision and distribution of information regarding a particular task that needs to be executed and this process of knowledge sharing is of extreme importance as it transfers individual knowledge to organisational knowledge (Foss, Husted & Michailova, 2010). As alluded to by (OuYang, 2014; Zhao, Lu & Wang, 2013;), knowledge sharing is a key component in any organisation as it affects positively on innovation levels of the organisation as a whole. Knowledge sharing, hence, involves tacit and explicit knowledge (Zhao, Lu & Wang, 2013).

I. Tacit Knowledge (TK)

According to Wang, Noe, and Wang (2014), TK is knowledge, which is both technical and cognitive; meaning that it cannot be expressed verbally, symbolically or in any written form. This type of knowledge only exists in the human mind of an individual and it is personal knowledge deeply-rooted in experiences and it is difficult to codify (Wang et al., 2014). Technical TK is demonstrated when people in the organisation have the ability to master a specific type of knowledge or skills that gradually help develop the individual and the organisation at large (Zhao, Lu & Wang, 2013). Cognitive TK includes implicit mental models and perceptions that help determine how organisations make decisions and influence the collective behaviour of every individual in the organisation (Brčić & Mihelič, 2015). TK is personalised when specific expertise is used to provide creative advice on high-level strategic problems thus TK helps to suit the organisational culture, customer needs and standard communication procedures (Brčić & Mihelič, 2015).

II. Explicit Knowledge (EK)

As stated by Foss et al., (2010) EK is the exact opposite of TK in that it is highly transmittable in formal and organised understood language. It can be expressed through various means such as writing, manuals, mathematical expressions, copyright and patents or other means such as the computer - websites, blogs, through the help of Information Technology that facilitates the conversion and transferring of the knowledge (Foss et al., 2010; Nonaka & Takeuchi, 1995).

Information retrieval systems of high quality allows EK to be carefully codified and stored in databases that are easily accessed (Brčić & Mihelič, 2015). The advantage of EK is that it can be reused over a period in order to solve different types of problems or connect people with valuable information and knowledge (Brčić & Mihelič, 2015). As highlighted by Wang et al., (2014), many organisations prefer EK as reliable and useful knowledge that can be shared within and outside of the organisation, resulting in information being obtained and stored in files and kept in records of the organisation for current and future use.

By using EK and TK, knowledge management helps the organisation deliver the right information to the right place and the right person at the right time. Organisations need to harness TK and EK, as both give an added advantage to the organisation in terms of having KMCs in place and knowing the external environment as well in order to attain innovation.

III. From Tacit to Explicit Knowledge

Routine and expert labour has experienced radical changes over time. At the centre of it have been efforts to convert tacit to explicit knowledge (Thompson & Mchugh, 2009). Tacit knowledge is not knowledge that is productive to the organisation because a few limited individuals in the organisation solely hold it. Therefore productivity or top performance is concentrated in the hands of a few people (Wang et al., 2014). Karimi and Javanmard, (2014) further insist that until tacit knowledge becomes explicit knowledge, tacit knowledge will not be effective to the organisation. This is because it does not benefit the organisation as a whole but individually. Hence it is of utmost importance for managers in the organisation to effectively transfer tacit to explicit knowledge in order to attain innovation levels that are deemed by the organisation to be very important.

2.8 The value of knowledge

The value of knowledge is analysed through Nonaka, (1994) who went on to show the difference between the western information processing and the Japanese approach which he believed led to the knowledge creating company (KCC) where knowledge is a source of competitive advantage (Thompson & Mchugh, 2009). Knowledge is created from the knowledge that lies hidden in the employees of the organisation and this knowledge needs a sense of identity between the employees and their organisation (Thompson & Mchugh, 2009).

This is congruent with the views of Kelloway and Barling (2000) who mentioned that the employee needed to be committed to the organisation they work for and trust the people they work with for the organisation to benefit from their knowledge. According to Kelloway and Barling (2000), trust has two components, which are the cognitive, and the affective component. The cognitive component has to do with employee confidence in the actions of suitably skilled management and the effective component has to do with the belief that managers would not intentionally carry out actions that would harm employees (Kelloway & Barling, 2000).

2.8.1 Nonaka's Spiral of Knowledge (S.E.C.I)

According to Thompson and Mchugh (2009) Nonaka's spiral of knowledge for the conversion of tacit to explicit knowledge has four stages:

- ✓ Socialisation – Transfers tacit knowledge between individuals through observation, imitation, and practice
- ✓ Externalisation – Is triggered by dialogue or collective reflection and relies on analogy or metaphor to translate tacit knowledge into documents and procedures
- ✓ Combination – Consequently reconfigures bodies of explicit knowledge through sorting, combining and categorising processes and spreads it throughout an organisation
- ✓ Internalisation – Translates explicit knowledge into individual tacit knowledge

Knowledge creation has strong associations to learning and commitment through socialisation and interpretation and this is the foundation of the people track in knowledge management (Thompson & Mchugh, 2009). Externalisation and combination reflect an information track through the experience, which is systematized and codified (Thompson & Mchugh, 2009). Externalisation is the most critical idea about the conversion of tacit knowledge to explicit knowledge (Thompson & Mchugh, 2009). According to Nonaka (1994) it is difficult to formalise tacit knowledge and it is generated in a personal and subjective way that is embedded in action as well as the skills. In contrast to tacit knowledge, explicit knowledge exists outside of the individual and can be easily recorded or communicated (Nonaka, 1994). Knowledge management then allows formalising the informal and to convert tacit knowledge into explicit knowledge as another way to appropriate expert power and innovate products and services.

Nonaka's conversion (tacit to explicit knowledge) demands that people challenge usual ways of doing things i.e. attitude and behaviour changes (Nonaka, 1994). A knowledge creating company requires an environment that is rich in knowledge and one that ensures that all employees have free access to information and this runs contrary to top-down management structures (Liu, & Deng, 2015).

2.9 Knowledge Economy Claims

As highlighted by Wang et al., (2014) knowledge economy is defined as the production and services based on knowledge-intensive activities that lead to the generation of high levels of technology. The key aspects of a knowledge economy include lots of dependence on intellectual property, together with integrated improvements in every stage of the production line; from R&D to the factory floor right straight to the customers. This knowledge economy has two claims. The first claim is:

2.9.1 Increasing knowledge intensity in the economy

This is the degree to which complex knowledge is the source of value and it results in the spread of jobs, which are focused on knowledge work. Knowledge work varies across different areas such as employment relationships as well as task arrangements that enable creative application of that knowledge (Thompson & Mchugh, 2009). Employers of organisations of today are now forced to delegate responsibilities because of the quest for increased creativity and participation from regular employees through, for example, team working (Wang et al., 2014)

The second claim is:

2.9.2 An increasing number of participants of the labour market made up of portfolio workers

This is because, from an organisational perspective, knowledge is useless if it cannot be harnessed from the minds of single individuals and shared amongst members of the whole organisation (Wang et al., 2014). Hence, employees are seen to benefit from their knowledge and organisations are dependent on these individuals with knowledge in order to achieve their goals (Thompson & Mchugh, 2009). This greatly characterises the changing business environment, which greatly relies on projects and teams (Wang et al., 2014). There are numerous opportunities for professionals to use their knowledge to bolster their chances of employment and achieve portfolio careers in occupational communities (Thompson & Mchugh, 2009).

Hence, the value of knowledge management as a business imperative lies in the need for organisations to develop formal strategies, which ensure that knowledge is retained and available where and whenever, needed to continually improve the organisational processes (Easterby-Smith & Prieto, 2008). Interestingly, on the other hand, Liu and Deng (2015) discuss the altering of organisational conditions to enhance employees' ability, motivation and opportunity about knowledge management.

Liu and Deng (2015) further posit that knowledge work is discretionary behaviour hence they refute claims of a direct link between employee knowledge and the organisation's intellectual capital. Furthermore, employees are thus viewed as investors in the organisation because they are the ones who decide whether to invest their specific skills into the firm or not and if they choose to invest the skills, they still decide when to do it and how much to invest (Liu & Deng, 2015). Organisations can catalyse investment decisions by, for example offering training programs. Even then, they cannot force learning to take place as it is up to the individual employee (Easterby-Smith & Prieto, 2008; Liu & Deng, 2015).

Human resources managers should hire employees with the needed competencies, which are concerned with their ability, then they should influence the expression of individual skills for the benefit of the organisational goals and that is motivation and this together with KMCs put in place will lead to innovation taking place (Liu, & Deng, 2015).

2.10 Knowledge Management: People Track and IT Track

Karl Sveiby who is regarded to be the father of knowledge management clearly highlighted that knowledge management has an information technology (IT) track that goes hand in hand with a people track (Thompson & Mchugh, 2009). Technology has led to large amounts of knowledge being stored, which people can lay a hold of (Thompson and Mchugh, 2009). As highlighted by Andreeva and Kianto (2012), KMCs work in conjunction with information technology and people (HRM) - hiring, training, rewarding etc. These two elements are important for the organisation in terms of codification and personalisation of strategies that will help harness the knowledge that is available for use, both tacit and explicit (Andreeva & Kianto, 2012). In codifying the knowledge and information, information technology is heavily invested in, resulting in connecting people with reusable codified knowledge. In personalising the knowledge, information technology help facilitate the exchange of tacit knowledge into explicit knowledge.

This is why organisations end up rewarding individuals for directly sharing this codified and personalised knowledge with others and using it into valuable knowledge that will give the organisation an edge over its main rivals (Andreeva & Kianto, 2012).

Furthermore, IT track like, computerised systems enable managers to monitor, use and establish the knowledge being used and who is using it thus supporting the measurement and valuation of knowledge assets in the organisation (Thompson & Mchugh, 2009). Andreeva and Kianto, (2012) carried out a research on the critical role played between knowledge management and IT, IT was found to be one of the key components as it connects humans to information as well as connecting humans to one another and this actively encourages collaboration and communication amongst members of the organisation. The main aim is to capture individual knowledge and turning it into an organisational asset and not just merely a personal one (Thompson & Mchugh, 2009).

Researches by (Andreeva and Kianto, 2012; Rotimi, 2016) state that there are three aspects of HRM or people track that is very crucial to how people and knowledge are managed in the organisation: employee selection methods, compensation strategies, and career development systems. Firstly, selecting and choosing new employees in this diversified global village is very important as it leads to the process of building an effective organisation's knowledge database. Organisations must be in a position to hire those individuals who have acquired the required knowledge and skills set that will be beneficial to the organisation as a whole. Secondly, compensation strategies put in place by the organisation will help promote better KMCs for the organisation that will help attain innovation levels required by the organisation. Both tangible and intangible incentives will definitely help motive employees to create and share knowledge, be it individually or in teams. Thirdly, career development does not just benefit the individual only but the organisation will reap rewards as their employees become well equipped with skills and knowledge that will give the organisation an edge over its main rivals. These developmental systems range from systematic training and education to employees on how to retain good employees and on how to retrieve information and knowledge from the external environment (Andreeva & Kianto, 2012; Rotimi, 2016).

From the above literature, it`s quite clear how organisations should collaborate people track and IT track in order to harness tacit knowledge to explicit knowledge so that organisations can be able to use that accessible knowledge wisely, with the help of IT so that they become innovative (Rotimi, 2016). The question then comes to mind; does Organisation A and Organisation B has this collaboration in terms of having effective KMCs, better organisational learning environment in this ever-changing environment? This will be identified in chapter four when results and findings are discussed in detail.

2.11 Knowledge Management, Societal and Organisational Change

As stated at the onset of this research, organisational longevity, competitive advantage and organisational innovation, hugely depend on how well they operate in a global post-capital and ever-changing volatile economic environment. Traditionally, many organisations of today will merely process information and solve problems but Nonaka (1994) denounces this approach. Nonaka (1994, p. 14) maintains that it is too passive and static for the survival of the organisation where "information processing is viewed as a problem-solving activity which centres on what is given to the organisation – without due consideration of what is created by it".

Nonaka (1994) goes on to say a globally competitive organisation, in this ever-changing economic environment, would need to be one that is not averse to change – particularly with regards to product design and capability. This is where innovation (a necessary key part of organisational development and knowledge management) intersects with organisational knowledge creation. Moreover, the key role of KMCs in any organisation is to make organisations more flexible to respond quickly and effectively to this ever-changing external environment so that they become innovative in order to keep up with current trends (Foss et al., 2010).

2.11.1 Organisational Case Study – Toyota Dyer's (1998)

This Toyota case study is a great example of how knowledge management systems are put in place in anticipation of organisational changes due to fluctuating external environments. This will make the organisation to easily learn, adapt and upgrade its KMCs in order to be innovative and gain competitive advantage.

According to Thompson and Mchugh (2009), the research into the Toyota Production System showed that Toyota's ability of knowledge transfers, from top to low-level management within its production network, has been key to their competitive sustenance over their arch-rivals in the motor industry. He further acknowledged four important knowledge-sharing systems that were developed and distributed between Toyota and its main suppliers and customers. The main reason for establishing these so-called knowledge-sharing systems was mainly to outsmart their rivals by being a trendsetter and setting a benchmark in the motor industry.

The following are the identified effective knowledge-sharing systems:

1. Establishing new locations for accumulating and spreading knowledge
2. Removing "Proprietary Knowledge" replacing it with top to bottom knowledge systems for everyone
3. Introducing motivating schemes for knowledge acquisition and application
4. The ever-changing evolution of Toyota's knowledge-sharing system

The result was that lean production practices introduced between1965-2000 was able to translate into labour productivity improvements. This is in contrast to the productivity of U.S automakers and suppliers, which was stagnant until the mid-1980s because the U.S model was simply to imitate the production practices of International Toyota's transplant operations in the U.S (Thompson & Mchugh, 2009).

Though this was deemed to be successful at the time, one can also argue that it was a long time ago and times have changed. Since the principle is the same, it will differ depending on the environment that the organisation is operating in and also if the organisation has effective KMCs in place to achieve innovation levels.

2.12 Trends in Knowledge management through literature

As stated by the Economist Intelligence Unit (2006), in researching trends of knowledge within organisations, there are four notable trends, which will be greatly discussed in detail, namely:

- ✓ the organisational shift in focus from physical assets to intellectual assets
- ✓ digitalisation - the concept of web-based tools as a means of knowledge sharing;
- ✓ the concept of retaining knowledge in the workplace to enable a competitive advantage; and

- ✓ globalisation – the concept of organisations developing international influence as organisations start operating at a global level

However, it is important to first identify the key elements of knowledge management stemming from the literature that forms the foundation of the trends identified. According to (Foss et al., 2010; Wang & Noe, 2010; Rotimi, 2016) KMCs are at the heart of knowledge management with elements of knowledge management being that of collaboration, problem-solving, idea-generation and embedding into the structure and strategies of an organisation in order to reach innovation levels desired by the organisations.

2.12.1 The organisational shift in focus from physical assets to intellectual assets

In literature, both current and past, including newspapers, books, and journals, one realises that organisations can no longer function successfully on the basis they did 20 years ago. The business landscape is changing with the introduction of new technology, new ways of thinking and the ever-changing external environment.

In order for the organisation to compete successfully in this fast-paced, volatile and highly competitive landscape, there is need to shift strategies and focus from traditional/conventional operating models. Hence it is important to have strategies and models that will enable success together with the knowledge base that their human capital has to offer (Economist Intelligence Unit 2006; Zhou & Li, 2012*)*. Andreeva and Kianto, (2012) highlight the challenges facing organisations of today is that the industry has become more competitive and organisations no-longer rely on the same competitive advantages that they once relied on upon in the early twentieth century. The success, therefore, of organisations worldwide is based on the impression of knowledge-sharing products and services produced by knowledge-sharing employees harnessing the skills of human capital (Rotimi, 2016).

In support of this, Wang et al., (2014) suggest that with the growth of rapid technological change and an ever increase in human capital in today`s organisation, logical-thinking assets have now replaced the conventional capital assets, land, and physical inventor. This notion, therefore, supports the idea of the evolution of the organisational landscape both globally and within the South African context, toward the embedding of KMCs within their overall business strategy (Rotimi, 2016).

The concept of knowledge management is fast becoming an economic phenomenon such that many organisations believe that not having effective KMCs in place will hamper their triple bottom line. Andreeva and Kianto (2012) highlight the concept of *mobilisation of valuable resources*, which alludes to the ability of an organisation to put together the human capital team that they require the most through the application of human knowledge. This is an important element relating to managing individuals in that the inability to mobilise teams, especially those that possess a wealth of knowledge, will result from stagnation and ineffectiveness in the organisations' ambition to achieve innovation. Also, organisations of today must be able to have effective KMCs in place that allow for sustainable competitive advantage by leveraging knowledge resources in this fairly harsh unpredictable environment with an ever-changing market (Andreeva & Kianto, 2012). A number of organisations in South Africa are fast adopting a knowledge-sharing culture as well as having structures and systems in place so that they can manage and share knowledge across the whole organisation.

One could also argue that in an organisation where the task of knowledge management is tasked to specific individuals, there is a higher tendency for knowledge management and knowledge sharing to be isolated to these dedicated resources. The reality is that people do what they are employed to do and what they are measured on (Wang & Noe, 2010). This view, therefore, outlines how, in order to get a collaborative effort, the importance of knowledge management and sharing should be driven aggressively from top to bottom and woven into the strategies of the whole organisation.

2.12.2 Digitalisation - the concept of web-based tools as a means of knowledge sharing

Knowledge conversion allow organisations to further improve their overall expertise and efficiency by converting acquired knowledge into applicable organisational knowledge so that it can be used where it needs to be used in the different organisational departments (Rotimi, 2016). In this ever-changing technologically environment that organisations operate in, as well as the significant increase in the use and constant growth of social media in South Africa and Africa as a whole, organisations are assessing ways and tools of integrating these two elements. As highlighted by Adamovic, et al., (2012) the Nielsen Company, a South African global information & measurement company that provides market research, did a practical study representing its own set of challenges due to this fact. Amongst some of the main challenges that the organisation faces are the inability to meet on a regular face-to-face basis due to the different geographic locations of the global company.

In order to overcome this communication barrier amongst other challenges, the organisation resorted to social media tools such as Skype, podcasts, blogs, email and intranet to name but a few. Although these are seen as reasonable ways of overcoming these challenges, one major challenge still remained - some employees were either unaware of these tools or they found these tools to be insufficient means of supporting their day-to-day activities. This was because of the organisation failing to have clear KMCs in place in order to counter this issue in the organisation. The research result, though, revealed 66% of the respondents prefer the use of electronic communication channels due to the speed, low geographic dependency, convenience and low-cost benefits associated with it. 31% of the respondents still prefer the face-to-face means of communicating and sharing of knowledge, as they still believed in the power of person-to-person engagements.

In contrary, some employees did not know nor make use of the social media tools, 94% of them agreed that the social media tools would improve the knowledge sharing culture of the organisation (Adamovic et al., 2012). This clearly highlights that when an organisation has efficient KMCs in place, with the help of technology, communication barriers are easily dealt with leading to effective outcomes in terms of how knowledge management is managed and how improving innovation levels are reached.

Many organisations within South Africa and Zimbabwe have adopted the social media strategy for sharing of knowledge and communicating across their respective organisations since they have different branches across the continent and the globe as well. However, one has to be cautiously optimistic in respect of the anticipated growth that one hopes to achieve. As highlighted by Adamovic et al., (2012) in the Nielsen`s case study, South Africans are generally skeptical in nature and therefore as a result, the likelihood of employees sharing knowledge openly on social media platforms within an organisation may be a barrier in itself.

Unless the organisation instills a culture that supports and promotes the use of social media platforms, majority of people remains skeptical. However, generally, apart from these few instances, employees are open to the sharing of knowledge across social media platforms (Tubigi & Alshawi, 2015). The only question for organisations is how they harness and use this tool effectively and if the adoption of change within the social media space is relatively slow; what are the interim tools that can be deployed to make this easier for employees and the organisation at large (Tubigi & Alshawi, 2015).

In order to encompass all this literature, this research will aim to find out if Zimbabwe and South African telecommunication organiations have the same problems when it comes to having effective KMCs in place in order to counter the social media barriers that organisations like Nielsen also encountered.

2.12.3 The concept of retaining knowledge in the workplace to enable a competitive advantage

As earlier mentioned, in order for an organisation to be innovative and remain competitive in today's ever dynamic environment, the organisation needs to focus on integrating knowledge management into its main strategies and day-to-day operations (Dalkir, 2013). However, this has not been the case with many organisations as they keep losing their key wealth of knowledge contributors through retrenchment, mergers, liquidation, fluctuating global prices etc. (Meihami & Meihami, 2013).

How then does an organisation identify and retain these key knowledge contributors in order to human capital loss and remain competitive and innovative? In response to this, researches by (Dalkir, 2013; Meihami & Meihami, 2013) identified three types of knowledge carriers, highlighting the risk of losing these carriers and the forces that impact knowledge loss:

Individuals

According to Dalkir (2013) these people carry individual (tacit knowledge) and experience. This sort of knowledge is inborn, undocumented and transferred through activities such as conversations and on the job training. Risks of these people leaving: taking all the knowledge built over the years, experiences and key relationships with them. Many organisations end up approaching these individuals to contract them on a consultancy basis – because adequate KMCs in the organisations were not put in place during the time these individuals left (Meihami & Meihami, 2013).

Groups

According to Meihami and Meihami (2013) this is the knowledge that has been created within a specific group over a period through interactions. The risk associated with this carrier mainly involves the loss of an individual or individuals who contribute a significant amount of the group's experience and problem-solving strengths together with the relationships they hold internally and externally.

In most cases, a group is only as good and effective as it is collectively hence groups are important to be a part of the whole organisation`s vision and success (Dalkir,2013).

Organisations

Individuals collectively make up the organisation's knowledge base and "know-how". Organisational knowledge is affected when groups of knowledge leave the organisation either through poaching, retrenchment or retirements (Dalkir, 2013; Meihami & Meihami, 2013).

External forces

Some of the external forces that contribute to knowledge loss include:

Economic shocks, Competition, Recession

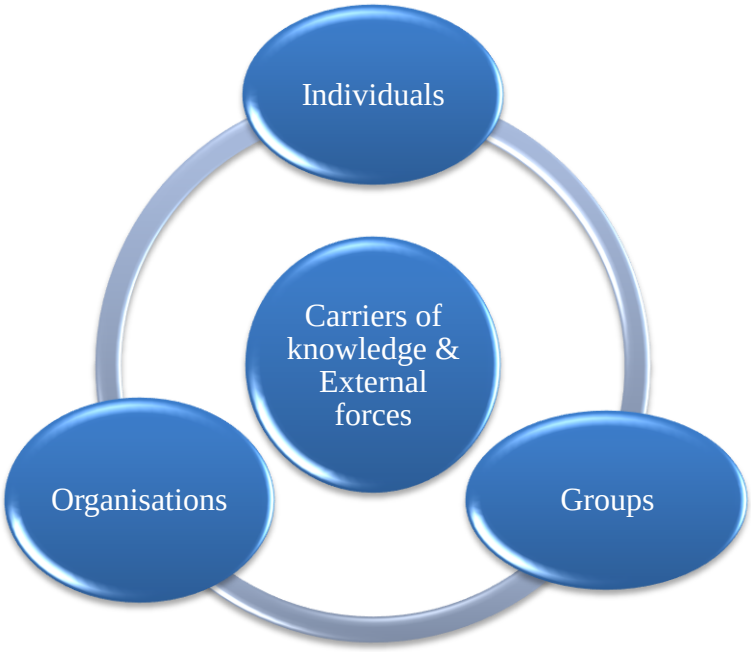


Figure 2.2 *Carriers of knowledge and external forces* (Dalkir, 2013; Meihami & Meihami, 2013).

As shown above, individuals, groups and organisations form the three main carriers of knowledge despite external forces posing a huge threat to their successful implementation in the organisation.

Retaining knowledge is very crucial to the sustainability of the organisation, but one can also argue with Dalkir (2013) that they did not deal with this in a comprehensive manner.

They only focused more on the retention of knowledge contributors as opposed to concentrating more on the importance of diversifying knowledge through the acquisition of new knowledge and the ability of the organisation to continuously learn to enable competitive advantage. However, according to Meihami and Meihami (2013), if one were to look at the possible solutions that are available to the organisation in order to retain knowledge in the organisation, the following elements come to mind as suggested by:

Brown Bag Sessions - a business unit calls on various experts to share their knowledge with the greater team. This takes place on a monthly basis and helps harness a learning culture in the organisation.

On-the-job training - this when time is spent with certain experts on a one-on-one basis.

Social media forums such as blogs - there is an increase in organisations using such or similar tools to communicate and impart knowledge in an online group forum basis. Despite the scepticism within South Africa, as mentioned earlier on, organisations should instil a culture that is conducive to sharing knowledge on these types of platforms.

Encourage a culture continuous learning - Meihami and Meihami (2013) highlight the risk associated with "older" knowledge and experience leaving the organisation as a major challenge to the organisation. This will result in "re-inventing the wheel" and "starting from afresh". By encouraging organisational culture of continuous learning, it definitely ensures the retention of necessary knowledge needed to ensure competitive sustainability of the organisation so that it remains innovative.

As highlighted from the above literature, it is important to note how knowledge retention is crucial to the survival of the organisation in this ever-changing high-demand environment. This research, in turn, will also seek to explore the various options that South Africa and Zimbabwean telecommunication organisations have in retaining their knowledge base.

2.12.4 Globalisation – the concept of organisations developing international influence as organisations start operating at a global level

Using the aforementioned Nielsen study, it is evident that organisations in Zimbabwe and South Africa should no longer only focus on knowledge management within a South an African context, but should also consider how employees can leverage the inherent knowledge that exists within their global counterparts (Adamovic, et al., 2012). A certain South African organisation has the advantage of having its British parent organisation as an advantage when it comes to being on the same European standards as that of its parent organisation. Adamovic et al., (2012) supports the concept of globalisation as a trend stating that organisations are now taking on global characteristics that help them conform to international standards – which could simply be seen as a Western influence, especially in industries such as consulting and telecommunications. With this trend, it requires employees to have a broader knowledge base than in the past, although this presents a challenge for organisations to retain employees (Brčić & Mihelič, 2015). .

These core trends present ideal opportunities for organisations within South Africa and Africa as a whole to reassess their approach to knowledge management by having effective KMCs in place to remain competitive in a dynamic environment that offers organisations the chance to be innovative in order to keep up with the current trends (Brčić & Mihelič, 2015). There is a definite shift in organisational management from the management of physical assets to the management of intellectual assets (human capital), as is evident in the above literature. However, organisations cannot be operated successfully without ensuring the concept of knowledge management is embedded in its strategic and operational management short-term and long-term objectives (Adamovic et al., 2012; Brčić & Mihelič, 2015). In this ever-dynamic environment, Zimbabwe and South African telecommunication organisations need to have effective KMCs put in place in order to be innovative by offering distinct products that will give them an edge over their archrivals. Whilst there is a logical move toward ascertaining ways of retaining existing knowledge, one should not disregard the dynamic and powerful impact of new knowledge.

There is a need for diversification of knowledge in an organisation - a combination of retaining existing and ‘old’ knowledge, but there is also need for new ways of thinking through ‘new knowledge' and new perspectives coming from new entrants into the workplace so that innovation levels are reached.

As Zimbabwe and South Africa experience a surge in youths seeking tertiary qualification, diversification of how organisations are run will also increase, giving organisations the chance to instil better KMCs that will make them competitive and innovative in this ever dynamic environment.

2.13 Conclusion

From the above literature review, the aim of this research was to establish a link that exists between knowledge management, organisational learning, environmental dynamism and innovation in organisations of today in Zimbabwe and South Africa. The above studies and theories related to all facets of knowledge management and how knowledge management is an important asset to the organisation. Organisational learning plays a crucial role in making sure that the environment in which employers and employees work in is conducive for them to generate ideas and new knowledge as well. A dynamic environment affects or rather pushes organisations to be innovative in order to remain relevant and successful and how innovation should be a part of organisations` main core aims. It is evident from the above literature that there is a link between the above-mentioned facets that lead to superior innovation. The following chapter will be the research methodology that will explain in detail of how data for this research will be collected.

Chapter 3: Research Methodology

3.1 Introduction

This chapter discusses in detail the research methodology of this particular research study. In the previous chapter, broad details of the literature review have been explored fully from factors affecting KMCs and knowledge management theories, how organisational learning and environmental learning plays a pivotal in determining the levels of innovation in an organisation. In this research, a quantitative approach is being utilised for Zimbabwe and South Africa by exploring all the various methods and techniques.

3.2 Research design

The researcher carrying out the research needs to make sure that the objectives of the research are incorporated well and indicate where the data is collected and gathered, the method or technique of the study, amongst other factors, hence the use of a research design comes into play. As stated by Cooper, Schindler and Sun, (2006; p.159), "research design is a strategy for a study and a plan by which the strategy is to be carried out, specifying the methods and procedures for the collection, measurement, and analysis of data". The plan selected for answering the research questions and testing research hypothesis of this study is a quantitative design. Initial items to measure various constructs were developed based on prior research, notably (Bansal & Roth, 2000; Crossan & Hulland, 2002 & Gray, 2002). The research questions for this research are going to be answered via the use of a survey research design that will use a quantitative approach to collect data, as it tends to be more highly structured, easy to measure and analyse responses (Wagner et al., 2012).

This research follows a cross-sectional design study whereby important data will be collected from employees and employers in Zimbabwe and South Africa. This will entail gathering descriptive details in the workplace, e.g. age, gender etc, (Cooper et al., 2006). The advantages of doing a cross-sectional study are as follows:

- ✓ it is affordable
- ✓ a large pool of participants
- ✓ it is constructive to the researcher
- ✓ the findings can be used by the other institutions for further research studies

The main disadvantage for the cross-sectional study is that the time and place of data collection may influence the participant`s answers due to current or historical events. A typical example can be that the answers of employees towards the study might be affected by political or economic situation during that time and place.

3.3 Research paradigm

According to Wagner et al., (2012) positivism (also known as logical positivism) is a structured way of doing research that establishes the truth and objective reality). Positivists often examine the relationships between measurable variables and it is largely based on scientific methods to study human actions at a particular time (Wagner et al., 2012). The research methodologies used by positivists are mainly experimental, quantitative and test hypotheses in nature. Therefore, the research paradigm for this research is a positivist paradigm. It is mainly concerned with the gathering of information about society in a more objective manner (Cooper et al., 2006).

3.4 Target population and sampling procedure

Undertaking a research study without choosing the respondents to participate in the research will be a waste of time hence the researcher has to target a certain population in order o carry out the research study. The target population will also help the researcher to choose which method to utilise in choosing participants as well as the sampling procedure that will be followed. The target population in this research will be employees and staff members of telecommunication companies, Organisation A and Organisation B in Zimbabwe and South Africa respectively. According to (Chulu, 2013; Mutisi, 2017) the target population size for the telecommunication organisations in Zimbabwe is +/-5,100 employees. The target population size for the telecommunication organisations in South Africa is approximately +/-47,500 employees (Mochiko, 2017; van Wyk, 2016). These two countries have many organisations in both the public and private sector, which provides a wide spectrum of employees and staff members from different organisations. Hence, the specific target population will be mobile organisations, namely Zimbabwe and South Africa. The reason for choosing these specific companies is the links associated with getting the necessary required information for this specific research.

Sampling plays an important role in any research study so that the general conclusion for the research may be drawn from the whole population (Cooper et al., 2006). For the purposes of this research, the sample will be non-probability sampling, which is based on the assumption that participants of the targeted population are unknown (Cooper et al., 2006). The reason for choosing this type of sampling method is that it is less complicated; it is affordable, in terms of time and financial expenses compared to other probability techniques.

3.4.1 Sample size estimation

According to Struwig and Stead (2001) in order to specify the sample size, the researcher should consider the following:

- ✓ the discrepancy of the population
- ✓ level of acceptable error
- ✓ confidence level

Sample size refers to the number of participants, respondents, or objects from whom necessary information is extracted from (Struwig & Stead, 2001). The reason for sampling is to help the researcher to approximate the general character of the population. Israel (2013) also alluded that there are various ways that the sample size can be determined and these include use of a census for small populations, imitating a sample size of similar previous studies, use of published tables, using formulas, amongst other methods and ways. The sample size will compose of employees, managers and staff members in Zimbabwe and South Africa combined. According to the estimated population gathered from the respective organisations in chapter 2, Organisation A has approximately over 2 500 employees in Zimbabwe whilst Organisation B has approximately over 7 500 employees in South Africa thus totalling close to 10 000 employees from both countries. As a result according to Israel (2013) model, for a population size of over 10 000, the sample size will be 370 based on a confidence level of 95%. (Refer to table 3.1).

3.4.2 Sampling technique

The sampling technique to be used for this research will be non-probability sampling in the form of convenience sampling. This is because of the availability of respondents since they will be easily available and accessible (Struwig & Stead, 2001). The reason for this choice of sampling is that the researcher will need to get access to organisations that easy to get the information that required for the research study to be a success. According to Cooper et al. (2006), participants are chosen and selected based on their availability and how accessible they are to the researcher.

In addition, convenience sampling is simple to carry out but on the contrary, it is the least reliable as well. Convenience sampling has its own advantages and disadvantages as well. As stated by Struwig and Stead (2001), the advantages are as follows

- ✓ It is a simple form of sampling that is also easy to carry out for the researcher
- ✓ It is cheaper to implement
- ✓ Data collected is easily facilitated in a short time

The following are the disadvantages of convenience sampling as stated by Struwig and Stead (2001):

- ✓ High levels of bias and sampling errors
- ✓ The researcher cannot generalise the results to the whole population.

3.4.3 Sampling strategy

This sample will be accessed through two main strategies namely: direct drop-offs and online (survey monkey).

3.5 Survey Technique and Data collection

According to Wagner et al., (2012) a survey technique is a technique in which information gathered from a sample of people is via questionnaire, interviews or other techniques. For purposes of this research study, an adopted questionnaire from previous studies will be used to gather data. That being said it is vital that questions on the questionnaire are properly phrased and structured to avoid uncertainty and confusion of answering questions. The researcher must make sure that the questionnaire is accurate and asking what it is intended to ask. As is the norm, researchers believe that questions should be clear, easy to understand, straightforward, unbiased (Wagner et al., 2012).

For the research to be completed data, needs to be collected as it is a crucially important aspect for the research study. Research data take different forms, which include numbers (quantitative data) or language (qualitative data) (Struwig & Stead, 2001). For this research, data collection will be quantitative in nature. The data collection process involved several stages that include: clarifying target goals and the methods that were used (surveys in the form of questionnaires); adoption of the questionnaire from a previous research but it will be slightly changed to suit this research study. Questionnaires were distributed via two methods: survey monkey and direct drop-offs to the respective organisations for this research. Respondents were guided by the simple instructions on the questionnaire on how to answer the questions.

Once the respondents had finished completing the questionnaires, the data collected was analysed and presented statistically using the SPSS tool. 370 questionnaires were distributed between the two organisations, Organisation A and Organisation B, 320 questionnaires were collected and 10 were returned incomplete. Hence 60 questionnaires had to be redistributed again to make sure the total number of questionnaires was 370 for the purposes of the research to be feasible and practical.

This research will make use of a survey method in order to gather the much-needed data. As defined by Wagner et al., (2012), a survey is a way of collecting original data by interacting with the participants in the study. The survey for this research will be examining knowledge management, environmental dynamism, and organisational learning to determine their impact on innovation levels in the two mobile organisations mentioned earlier on. Wagner et al., (2012) highlighted the advantages of surveys as follows:

- ✓ Surveys easy to manage
- ✓ They are flexible and efficient
- ✓ They provide the exact information about what the respondents` views
- ✓ They collect data from a large number of respondents

According to Wagner et al., (2012), the main disadvantages of surveys are:

- ✓ Respondents may not provide true answers that portray them in a negative away
- ✓ Data provided by respondents may be untrue or biased
- ✓ Surveys with closed-ended questions provide a lower validity rate
- ✓ Self-administered questionnaires or surveys run the risk of having certain errors

3.6 The measuring scale and research instrument

This research has a questionnaire that will be utilised to collect data from respondents. The questionnaire will be split into two parts: the demographic part that will be asking for information such as age, gender etc. The second part will describe critical components on knowledge management, organisational learning, environmental dynamism, and innovation. The questionnaire that was chosen as data collection instruments in this research was adapted from previous studies done before thus making it easy and reliable to conduct this study. It has four categories: KMC, OL, ED, and Innovation. Answers to the statements will be captured on a 5-point Likert-type scale, where 1 represents totally disagree and 5 totally agree. Reliability along with the validity of the measuring constructs will also be assessed.

Below are some of the sample statements on the adapted questionnaire (Kamasak et al., 2016):

Knowledge Management Capabilities (KMC) (Alavi & Leidner 2001; Tanriverdi 2005; Wu & Chen 2014)

- ✓ Our firm has the capability to transfer relevant knowledge to employees.

Environmental Dynamism (ED) (Jansen et al., 2009; Zhao & Wang, 2013)

- ✓ Environmental changes in our local market are intense.

Organisation Learning (OL) (Amabile, Conti, Coon, Lazenby, & Herron, 1996); Alegre & Chiva, 2008)

- ✓ Employees are encouraged to communicate.

Innovation Performance (Jansen et al., 2009; Terziovski, 2010)

In the last 3 years, compared to our major competitors, our firm is more successful in terms of:

- ✓ The success of new products launched.

This being said, a close-ended **questionnaire** will be used to carry out the data collection process adapted from (Kamasak et al., 2016).

3.7 Data Quality Control

As the researcher conducting this research, it is of utmost importance to make sure that the data-gathering instruments to be used will measure what is supposed to be measured and measured in a consistent manner as well. In any case, of incomplete data and wrong data information, data clearing method will be utilised in the form of issuing other questionnaires to compensate the misplaced data. Since this research is a quantitative research, reliability and validity will measure the consistency of the data-gathering instruments to endure data quality (Struwig & Stead, 2001).

3.8 Data Analysis

Data analysis refers to the, analysing and interpretation of the data collected (Bryman & Cramer, 2005). According to Bryman and Cramer (2005) the researcher carries out statistics so that a true indication of the data has been gathered accordingly. For this study, the Statistical analysis will be used to analyse the collected data. Preferably, all calculations and analysis will be performed using the Statistical Package for the Social Sciences – (SPSS).

The relationship between knowledge management, Organisational learning, Environmental Dynamism and Innovation in organisations will be assessed using parametric tests as the researcher wants to find out the relationship that exists between the variables (Bryman & Cramer, 2005). The assumption is that the data to be collected will follow normal distribution hence parametric tests will be used but if the data doesn't follow a normal distribution, a process called Bootstrapping will be utilised so as to normalise the data. According to Taylor, (2018), Bootstrapping is a statistical process that allows measures of accuracy to be put in place to eliminate bias, variance, non-normality of data, amongst other discrepancies. Some of the parametric tests that will be carried out include ANOVA, Multiple linear regression analysis, Pearson's r correlation, Z and T-test, means and standard deviation, moderation analysis.

3.9 Validity and reliability tests

Taking into account the reliability and validity of this research study is very important in making sure a true reflection of this research study. Reliability and validity analyses are used to minimise the biases and errors associated with the measurement constructs (Kimberlin & Winterstein, 2008). Reliability and validity are two different notions but they are on the other hand closely linked (Wagner et al., 2012). First, validity will be explored in more detail followed by reliability.

3.9.1 Validity

Validity is best known as the level to which a measuring instrument measures what it is supposed to measure (Kimberlin & Winterstein, 2008). Wagner et al., (2012) further explain validity as an assumption that aims to search for the true clarity of results from the data collected. Validity is further split into three main aspects, namely content validity, criterion-related validity and constructs validity Wagner et al. (2012).

I. Content Validity

According to Kimberlin and Winterstein, (2008) content validity deals with how a measuring instrument measures all the items of a particular variable. Content validity entails the researcher to look for items that represent the content of the variable intended to be measured, hence as a result during the process of constructing the measuring instrument, then it is the responsibility of the researcher to identify the entire constructs that are to be measured (Kimberlin & Winterstein, 2008).

II. Criterion-related Validity

This type of validity is also known as predictive-validity, which involves comparing the measuring tool and its results in determining the link that exists between anticipated performance and actual performance (Wagner et al., 2012). According to Wagner et al. (2012), predictive validity and concurrent validity are the two types of criterion-related validity.

III. Construct Validity

This type of validity makes sure that the closeness of the measuring instrument to the hypothesis is related to other measures done from previous studies (Kimberlin & Winterstein, 2008). As stated by Wagner et al. (2012), convergent validity and discriminant validity are the two types of construct validity.

3.9.2 Reliability

As stated by (Larsson, 2015; Berchtold, 2016) reliability makes sure that the internal consistency of measurements of the research study is still the same over a period of repeated trials. It also allows meeting specific requirements over a period of time. There are different types of reliability that help measure internal consistency:

I. Inter-rater Reliability

This method of reliability measures and evaluates the degree to which different raters understand, agree and rate their valuation choices (Larsson, 2015).

II. Test-retest Reliability

The test-retest type of reliability is when the researcher controls and uses the same measuring tool over a period of different times, asking the same questions and following the same procedure over and over again (Berchtold, 2016). The expected results should be consistent, taking into consideration; that there has been no alteration at all, in what is being measured.

III. Parallel-forms Reliability

According to Larsson (2015) this type of method takes into account distributing different types of measuring instrument to an identical group of people over a period of time.

IV. Internal Consistency Reliability

This method measures and assesses the various test items that check for similar constructs to check for related results (Berchtold, 2016).

The most commonly used tool and technique for measuring reliability is the Cronbach Alpha, which was developed in 1951 by Lee Cronbach (Tavakol & Denmick, 2011). The Cronbach Alpha is mainly concerned with the internal consistency of the measuring instrument (Tavakol & Denmick, 2011). According to Tavakol and Denmick (2011), alpha values range between 0 and 1, with an acceptable range between 0.70 and 0.95. This research uses Cronbach`s Alpha as a measure of reliability. Since this study is a quantitative study in nature, validity ensures that the research measures what it is supposed to measure. In order to examine the constructs for this particular study, tests for reliability and validity were conducted, (Kamasak et al., 2016). In order for constructs to be deemed valid, each scale item needs to have a loading of 0.5 or higher thus the Cronbach alphas for the constructs were as follows:

KMC: α=0.894

ED: α=0.812

OL: α=0.854

Innovation: α=0.920.

3.10 Limitations

It will be improper not to highlight the limitations that the researcher will likely to encounter. Since this research study will be a cross-sectional study, it is important to highlight cross-sectional limitations. Struwig and Stead (2001) indicate that a cross-sectional study is a research tool used to gather information based on data gathered for a particular moment. The data gathered comes from different people with different characteristics and demographics known as variables (Struwig & Stead, 2001). These variables include age, gender, income, education, geographical locations, and ethnicity among others. According to Younus (2014), research methodology provides the backbone of the research study and as a result, it consists of two broad phases that shape the whole research namely: planning and execution. Hence, it is clear that during these two phases limitations beyond our reach are inevitable (Younus, 2014). The limitations that the researcher will face for this research are diverse. Since this is a cross-sectional study, the period is short. There is low validity as answers to the research study are limited in information. Responses can lead to respondent bias which affects the whole research. Improper representation of the target population as only a few organisations represents the whole population. Some questionnaires are returned unanswered or even spoilt. Limited outcomes and responses from respondents since questions are closed-ended. The timing is not guaranteed to be exact as things might change during the course of the research.

3.11 Ethical Considerations and Questionnaire Procedure

As stated by Saunders, Lewis and Thornhill (2009) ethical considerations and ethical behaviour are the essences of having a good and quality research hence they need to be taken seriously into consideration. Here are some of the ethical considerations that need to take into account. Research participants should not be subjected to any harm in any way. Full participation consent should be obtained from all participants. Confidentiality and anonymity of participants participating in the research should be ensured. The use of other individual`s work without the proper permission or reference is unethical.

Hence, acknowledgement of work from other authors or researchers should be ensured through referencing. Falsification/distortion of results is clearly unethical and improper.

3.11.1 General considerations

During the research, the researcher should take into account a number of considerations. The researcher should make sure that the measuring instrument that will be used is going to measure exactly what it is intended to measure. Since this research is using an adapted questionnaire from a previous study, the questions in that questionnaire must be clear and easy to understand so that there is no need to explain the questions to the respondents. Questions on the questionnaire must make sure the participant answers the questions freely (Burns & Bush, 2003). Respondents usually get annoyed when answering questions on the questionnaire that appear to be too long hence respondents end up not answering the questions (Burns & Bush, 2003).

For this research, both ethical and general considerations were considered and implemented. Permission letters from both Zimbabwe and South African organisations were approved to the researcher to collect data from the employees and employers. The Wits Ethics Committee approved this research before data collection took place from the above-mentioned organisations. Participating is voluntary therefore; respondents participating in this research study have the right to withdraw from the research study at any time. Anonymity and confidentiality are firmly guaranteed.

3.11.2 Questionnaire Procedure

The questionnaires for this research study will be circulated to respondents in the two above-mentioned organisations where respondents will fill in the questionnaire.

After all, questionnaires have been answered, the researcher to ensure adequate response rate will collect data. All respondents will be expected to fill all the questions. Participation will be strictly voluntary, participants will not be forced to answer the questionnaire, and they may withdraw from partaking in the study if they want to. Consent forms will be given to the organisations as well to make sure that respondents are anonymous. All information will be kept strictly confidential and will be used for further educational purposes.

3.12 Conclusion

Briefly, chapter three has discussed all aspects and attributes in full detail by explaining the research design, data collection methods, measuring instruments, sampling, and data analysis amongst other important factors that will lead to the completion of this research. Therefore, the next chapter, chapter four, will focus on the discussion, interpretation, and analysis of the results and findings that have been collected and gathered from the two organisations in this research.

Chapter 4: Results, Discussion and Interpretation of Findings

4.1 Introduction

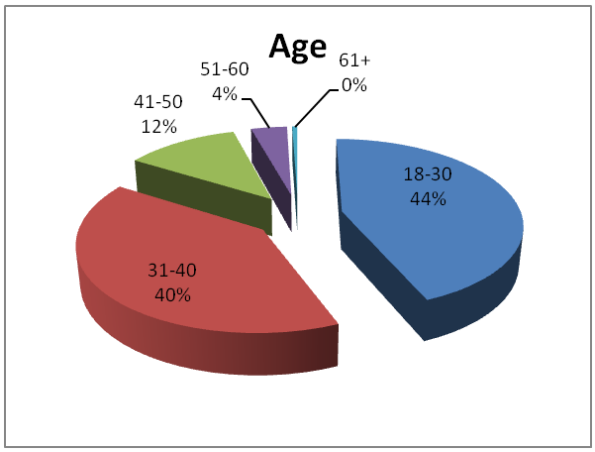
This chapter will highlight the results from the data collected at Organisation A and Organisation B. The employees filled in 370 questionnaires that where distributed between the two organisations regarding the views of knowledge management, organisational learning and environmental dynamism towards achieving innovation. The researcher using IBM SPSS version to see whether there is a link that exists between knowledge management, organisational learning and environmental dynamism towards achieving innovation and all these tests will be discussed in detail in this chapter conducted extensive analysis and tests of data collected.

4.2 Descriptive tests

The tables below indicate the demographic profiles of the current study. Descriptive statistics provide a general pattern of how respondents participated based on their age, gender, years of experience and level of management they possess in the organisations.

The tables below represent the demographic profiles for Organisation A (Zimbabwe)

Table 4.1: Age – Organisation A

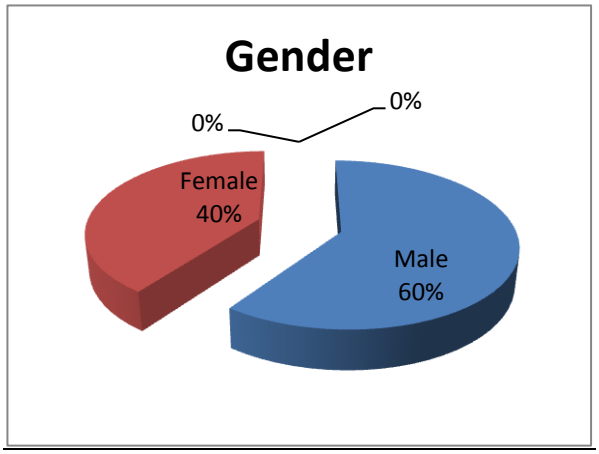


Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-30 Years	81	43.8	43.8	43.8
	31-40 Years	74	40.0	40.0	83.8
	41-50 Years	22	11.9	11.9	95.7
	51-60 Years	7	3.8	3.8	99.5
	61 Years and above	1	.5	.5	100.0
	Total	185	100.0	100.0	

As highlighted above those aged between 18-30 had the highest percentage of the total sample with 44% followed by 40% for the 31-40 age group. The next age group of 41-50 constituted up to 12% that also participated. The 51-60 age group only had 4% whilst the least of the age groups, 61+ had 0% of the total sample in Organisation A.

Table 4.2: Gender – Organisation A

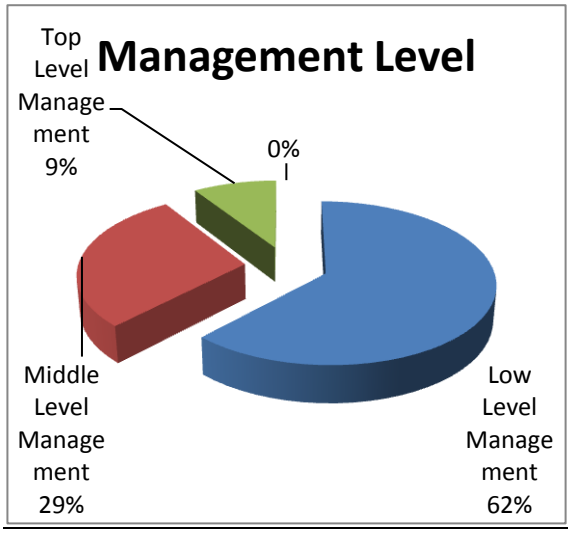


Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	111	60.0	60.0	60.0
	Female	74	40.0	40.0	100.0
	Total	185	100.0	100.0	

As highlighted from the table above in terms of gender, males participated more (60%) than their female counterparts (40%) in Organisation A.

Table 4.3: Management Level – Organisation A

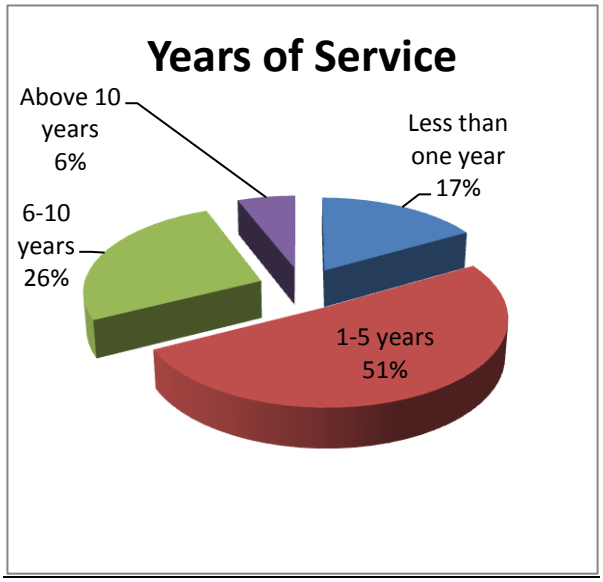


Management_Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low Level Management	115	62.2	62.2	62.2
	Middle Level Management	53	28.6	28.6	90.8
	Top Middle Management	17	9.2	9.2	100.0
	Total	185	100.0	100.0	

Employees from all three levels of management participated in this research study. Low-level management was the highest with 62% responding. The middle-level management was the second highest with a 29% of the total sample. Top-level management was the least represented with only 9% of the total sample because most senior managers were hard to find due to work commitments whilst some were even out of the country.

Table 4.4: Years of Service – Organisation A



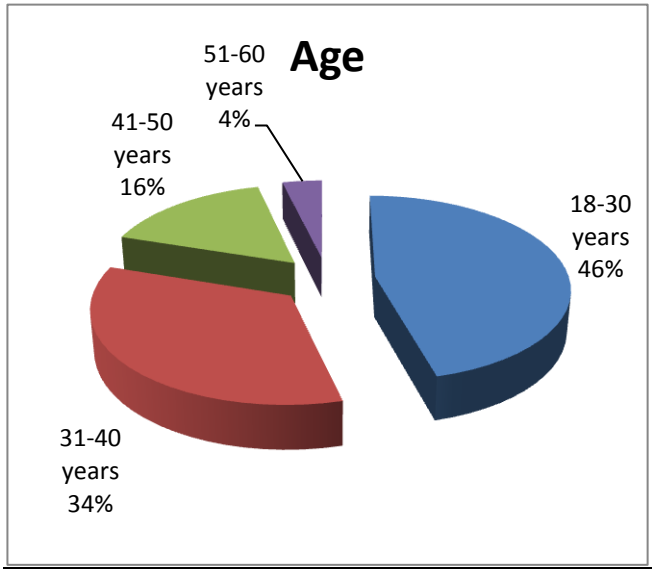
Years_of_Service

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than one year	31	16.8	16.8	16.8
	1-5 years	94	50.8	50.8	67.6
	6-10 years	49	26.5	26.5	94.1
	Above 10 years	11	5.9	5.9	100.0
	Total	185	100.0	100.0	

As illustrated above, the employees with 1-5 years of service had 51% of the total sample followed by employees with 6-10 years of service who amounted to 26% of the sample. Employees with less than one year totaled up to 17% whilst the least number of employees were those with over 10 years of working experience, only represented by 6% of the total sample in Organisation A.

The tables below represent the demographic profiles for Organisation B (South Africa)

Table 4.5: Age – Organisation B

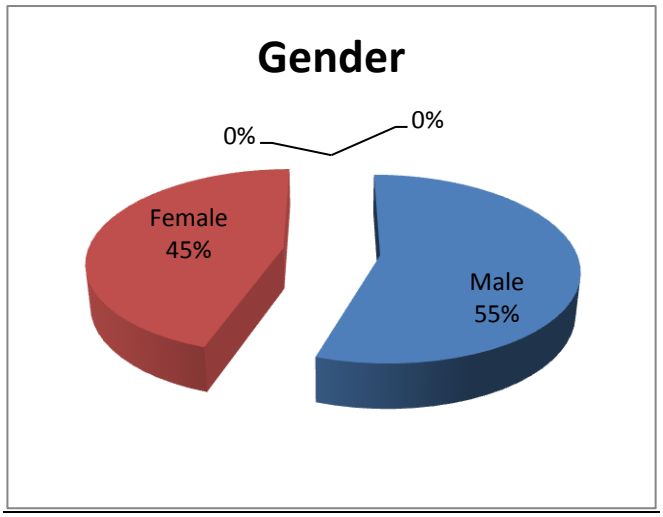


Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-30 Years	85	45.9	45.9	45.9
	31-40 Years	63	34.1	34.1	80.0
	41-50 Years	30	16.2	16.2	96.2
	51-60 Years	7	3.8	3.8	100.0
	Total	185	100.0	100.0	

As highlighted above those aged between 18-30 had the highest percentage of the total sample with 46% followed by 31% for the 31-40 age group. The next age group of 41-50 constituted up to 16% that also participated. The least participants emanated from the 51-60 age group only had 4% of the total sample in Organisation B.

Table 4.6: Gender – Organisation B

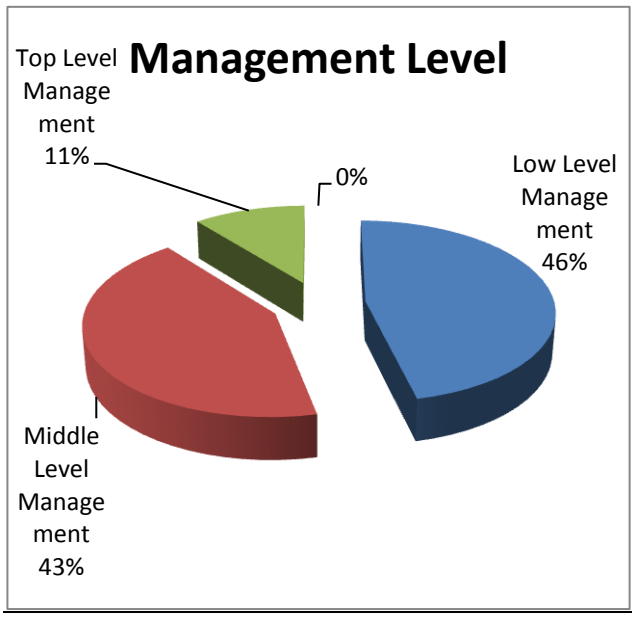


Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	102	55.1	55.1	55.1
	Female	83	44.9	44.9	100.0
	Total	185	100.0	100.0	

From the above table, it is evident that males, same as in Organisation A, dominated once again by participating more (55%) than their female counterparts (45%) in Organisation B.

Table 4.7: Management Level – Organisation B

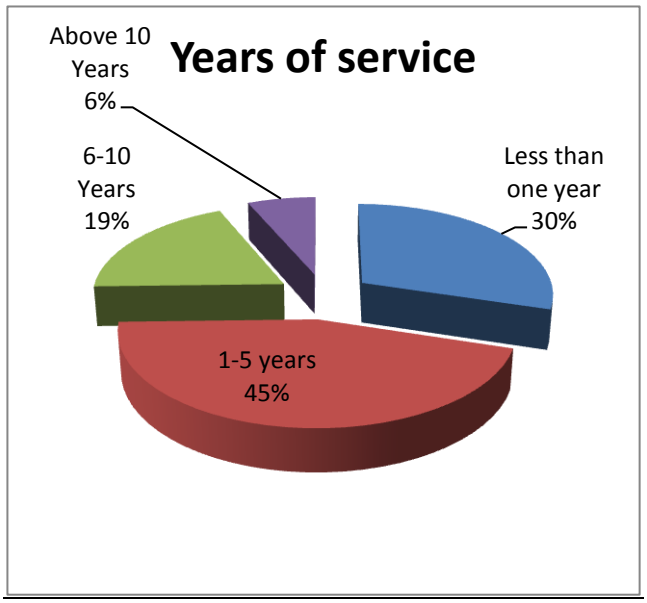


Management_Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low Level Management	86	46.5	46.5	46.5
	Middle Level Management	79	42.7	42.7	89.2
	Top Middle Management	20	10.8	10.8	100.0
	Total	185	100.0	100.0	

The above table highlights the three management levels that participated in this research study in Organisation B. Employees in the low-level management had the highest number of participants with 46% participating. The middle-level management had 43% of employees of the total sample and the top-level management being the least represented with only 11% of the total sample because it was difficult to find most of the senior managers as they had other work commitments in and out of the country.

Table 4.8: Years of Service – Organisation B



Years_of_Service

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than one year	55	29.7	29.7	29.7
	1-5 years	83	44.9	44.9	74.6
	6-10 years	35	18.9	18.9	93.5
	Above 10 years	12	6.5	6.5	100.0
	Total	185	100.0	100.0	

As illustrated from the above table, employees between 1-5 years of service had the highest number with 45% of employees participating. Followed by 30% of employees with less than one year in Organisation B. Employees with 6-10 years had a total of 19% of the total sample whilst those with over 10 years of working experience were only represented by just 6% of the total sample as it was also difficult to find time for the senior members at Organisation B.

4.3 Reliability Analysis

This analysis was performed to test for uniformity, it makes use of the Cronbach`s Alpha which measures how a pack of indicators explain a construct, it is mostly acceptable at 0.70 as stated in the literature (Heale & Twycross, 2015). The following table will highlight the Cronbach Alphas of each variable for this study and how reliable are they for ensuring validity for this research.

4.3.1 Reliability Analysis – Organisational Learning (OL)

Table 4.9: Reliability Analysis - OL

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.854	.853	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
OL1	14.54	11.663	.562	.360	.849
OL2	15.31	10.403	.679	.482	.820
OL3	15.26	9.756	.730	.537	.806
OL4	15.11	10.170	.694	.540	.816
OL5	14.73	10.068	.672	.487	.823

The above results table indicates that all the scores of the five items representing the Organisational Learning construct are quite acceptable since all five constructs are above 0.70 as stated by (Heale & Tycross, 2015). This shows good internal consistency of the items. The total Cronbach`s alpha value for organisational leaning is 0.854, which indicates an acceptable level of internal consistency.

4.3.2 Reliability Analysis – Knowledge Management Capabilities (KMC)

Table 4.10: Reliability Analysis - KMC

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.894	.896	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
KMC1	17.00	7.453	.773	.628	.864
KMC2	17.08	8.151	.665	.513	.888
KMC3	17.07	7.434	.800	.674	.858
KMC5	17.13	6.776	.776	.687	.866
KMC6	16.96	7.831	.707	.562	.879

The above results table indicates that all the scores of the five items representing the Knowledge Management Capabilities (KMC) construct are quite acceptable since all five constructs are above 0.70 as stated by (Heale & Tycross, 2015). Originally, there were 6 items that were measuring KMC but one item was removed since it was not consistent in what it was supposed to measure thus resulting good internal consistency of the remaining items. The total Cronbach`s alpha value for organisational leaning is 0.894, which indicates an acceptable level of internal consistency.

4.3.3 Reliability Analysis – Innovation Performance (IP)

Table 4.11: Reliability Analysis – Innovation

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.920	.921	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
IP1	12.18	5.833	.785	.629	.906
IP2	12.13	5.428	.866	.752	.879
IP3	12.31	5.639	.834	.705	.890
IP4	12.23	5.516	.781	.623	.909

The above results indicate that all the scores of the four items representing the Innovation Performance (IP) construct are quite acceptable since all four constructs are above 0.70 as stated by (Heale & Tycross, 2015). This shows good internal consistency of the items. The total Cronbach`s alpha value for organisational leaning is 0.920, which indicates an acceptable level of internal consistency.

4.3.4 Reliability Analysis – Environmental Dynamism (ED)

Table 4.12: Reliability Analysis - ED

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.812	.823	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
ED1	16.29	8.801	.682	.535	.763
ED2	16.70	8.048	.579	.529	.782
ED3	16.53	6.873	.657	.521	.764
ED4	16.53	8.559	.540	.448	.793
ED5	16.45	8.623	.612	.482	.774

The above results indicate that all the scores of the five items representing the Environmental Dynamism (ED) construct are quite acceptable since all four constructs are above 0.70 as stated by (Heale & Tycross, 2015). This shows good internal consistency of the items. The total Cronbach`s alpha value for organisational leaning is 0.812, which indicates an acceptable level of internal consistency.

4.4 Pearson Correlation Analysis

A correlation analysis measures the association between two or more variables. It ranges from -1 to +1, where -1 specifies a negative correlation and +1 represents a positive correlation (Wagner et al., 2012). Furthermore, associations are categorised into the following:

Table 4.13: Correlation Interpretation

Strength of the correlation	Interpretation
0.81 to 1.0	Very strong relationship
0.61 to 0.80	Strong relationship
0.41 to 0.60	Moderate relationship
0.21 to 0.4	Weak relationship
0.0 to 0.20	Very weak to no relationship

Source: Wagner et al., (2012)

Correlations

		KnowledgeManagementCapabilities	EnvironmentalDynamism	OrganisationLearning	InnovationPerformance
KnowledgeManagement Capabilities	Pearson Correlation	1	.410**	.552**	.563**
	Sig. (2-tailed)		.000	.000	.000
	N	370	370	370	370
EnvironmentalDynamism	Pearson Correlation	.410**	1	.222**	.452**
	Sig. (2-tailed)	.000		.000	.000
	N	370	370	370	370
OrganisationLearning	Pearson Correlation	.552**	.222**	1	.649**
	Sig. (2-tailed)	.000	.000		.000
	N	370	370	370	370
InnovationPerformance	Pearson Correlation	.563**	.452**	.649**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	370	370	370	370

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 4.1: Pearson Correlations

From the above figure using the Pearson Correlation (relationship), it is evident that there is a positive correlation at 99% level significance between the four variables, knowledge management, organisational learning and innovation performance which support the below hypotheses:

H1: KMC is positively related to Innovation (0.563) - which implies that there is a strong association between the two variables.

H2: Organisational learning is positively related to Innovation (0.649) - which implies that there is a strong association between the two variables.

H3: Environmental Dynamism moderates the relationship between KMC and Innovation (0.410) and (0.452) respectively - which implies that there is a moderate association when Environmental Dynamism moderates the relationship between KMC and Innovation.

H4: Environmental Dynamism moderates the relationship between Organisational Learning and Innovation (0.222) and (0.452) respectively - which implies that there is a weak/moderate association when Environmental Dynamism moderates the relationship between Organisational Learning and Innovation.

4.5 Non-Parametric – Spearman`s Correlations

Correlations

			KnowledgeManagementCapabilities	EnvironmentalDynamism	Organisation Learning	InnovationPerformance
Spearman's rho	KnowledgeManagement Capabilities	Correlation Coefficient	1.000	.453**	.515**	.562**
		Sig. (2-tailed)	.	.000	.000	.000
		N	370	370	370	370
	EnvironmentalDynamism	Correlation Coefficient	.453**	1.000	.188**	.454**
		Sig. (2-tailed)	.000	.	.000	.000
		N	370	370	370	370
	OrganisationLearning	Correlation Coefficient	.515**	.188**	1.000	.584**
		Sig. (2-tailed)	.000	.000	.	.000
		N	370	370	370	370
	InnovationPerformance	Correlation Coefficient	.562**	.454**	.584**	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	370	370	370	370

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 4.2 highlights the non-parametric spearson`s correlations between the study`s variables

When using the non-parametric test, Spearman`s Correlation (relationship), it is evident that there is a positive correlation at 99% level significance between knowledge management, organisational learning and innovation performance which support the below hypotheses below:

H1: KMC is positively related to Innovation (0.564) - which implies that there is a strong association between the two variables.

H2: Organisational learning is positively related to Innovation (0.584) - which implies that there is a strong association between the two variables.

H3: Environmental Dynamism moderates the relationship between KMC and Innovation (0.453) and (0.454) respectively - which implies that there is a moderate association when Environmental Dynamism moderates the relationship between KMC and Innovation.

H4: Environmental Dynamism moderates the relationship between Organisational Learning and Innovation (0.188) and (0.454) respectively - which implies that there is a weak/moderate association when Environmental Dynamism moderates the relationship between Organisational Learning and Innovation.

The above correlation figures indicate that all three variables; knowledge management, organisational learning and environmental dynamism do possess a relationship with the dependent variable, Innovation. This implies that organisation A and organisation B need to make sure that these three variables are utilised effectively in the organisation in order to achieve innovation levels at all times.

4.6 Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.869
Bartlett's Test of Sphericity	Approx. Chi-Square	4523.788
	df	136
	Sig.	.000

Figure 4.3: Factor Analysis

Twenty items were exposed to the Principal Components Analysis (PCA) with varimax rotation. To run factor analysis, data was tested for suitability using two diagnostic statistical measures namely: Kaiser-Meyer Olkin (KMO), to measure sampling adequacy and Bartlett`s test to measure sphericity. A decent factor analysis is represented by 0.6, and Bartlett`s test should be significant (i.e. p-value < 0.05) for factor analysis to be considered suitable (Bartlet, 1954). Figure 4.11 above indicates that the KMO value = 0.869 is more than the threshold value of 0.6 and the Bartlett`s Test of Sphericity is significant (i.e. p-value = 0.000 < 0.05) suggesting that the data set was fitting for factor analysis.

Communalities

	Initial	Extraction
KMC1	1.000	.784
KMC2	1.000	.672
KMC3	1.000	.809
KMC4	1.000	.741
KMC5	1.000	.748
KMC6	1.000	.710
ED2	1.000	.665
ED3	1.000	.791
OL1	1.000	.576
OL2	1.000	.636
OL3	1.000	.710
OL4	1.000	.725
OL5	1.000	.677
IP1	1.000	.834
IP2	1.000	.864
IP3	1.000	.842
IP4	1.000	.748

Extraction Method: Principal Component Analysis.

Figure 4.4 Principal Component Analysis (PCA)

The figure above shows the communalities that were extracted from the initial 20 items of this particular study and 3 items had a loading of less than 0.5, which led to these items being removed because they did not measure what they were supposed to measure. In the table above, all factor loadings are above 0.5, indicating strongly that the factors measured exactly what they were intended to measure.

4.7 Independent t-test

The test for independent groups compares the means of two unrelated groups, (Wagner et al., 2012). In this particular study, the comparison is between Organisation A and Organisation B operating in two different environments. The figure below illustrates the outcome from this research:

Group Statistics

	Organisation	N	Mean	Std. Deviation	Std. Error Mean
EnvironmentalDynamism	Organisation A	185	4.3117	.73113	.05375
	Organisation B	185	3.9604	.89732	.06597

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
EnvironmentalDynamism	Equal variances assumed	7.231	.007	4.129	368	.000	.35135	.08510	.18401	.51869
	Equal variances not assumed			4.129	353.573	.000	.35135	.08510	.18399	.51872

Figure 4.5 Independent T-test

From the above figure, it is evident that the significance value is 0.07, which is greater than 0.05 (0.07>0.05) thus highlighting equal variances assumed. On the other hand, the p-value 0.000 is also smaller than the significance level of 0.07 therefore indicating that the difference in means by service provider is significant. Because of this, it is evident from the above table that the mean of Organisation A is significantly greater than the mean of Organisation B. The main interpretation would be that Organisation A operates in a high dynamic environment that is constantly changing due to various factors affecting the economy.

As highlighted by Mataranyika (2018), the economy in which Organisation A operates in seems to be worsening and this has negatively affected many organisations. But since Organisation A is one of the biggest mobile operators in the country, the organisation has been able to be robust in terms of their innovation levels so as to remain competitive in the harsh and dynamic environment. One of the most innovative ideas to come out of this adversity is the online payment/transfer of money to purchase goods and services for people and businesses and this platform also works within the SADC region, (Mataranyika, 2018). This has been a major success for the company and it is still afloat despite the challenges the organisation faces in the country. In hindsight, the negative challenges that the organisaion has faced due to the country`s economic, social and political instability have proved to be a success as the organisation managed to be creative and innovative in order to fight the challenges of lack of cash in the local banks. This also highlights the importance of KMCs in the organisation as Organisation A managed to harness their talent and tech-know-how in order to achieve this innovation success. The ability of Organisation A to also have Organisational Learning traits as well played a significant role.

The employees, employers and the organisation as a whole managed to assess and learn about the dynamic external environment and they came up with various ways to counter this ever-changing external environment by being creative and innovative in terms of their products and services that they offer to the general public. Prior research (O`Connor, 2008; Kamasak et al., 2016; Schilke, 2014; Yayavaram & Chen, 2015) have indicated that organisations that operate in harsh, ever-changing environments appear to develop more and effective KMCs and OL traits in order to achieve innovation success and remain competitive.

On the other hand, Organisation B appears to be operating in a fairly stable environment as shown from the above means. This therefore means that Organisation A has better KMCs and Organisational Learning traits, which promote more creation of new knowledge and creative thinking that will lead to superior innovation levels. On the other hand, this does not mean that Organisation B is less creative in any way as the organisation has been stable for quite a long time since it operates in a stable environment as compared to Organisation A. Organisation B is quite innovative in its own ways and they have managed to be successful for a long time all because it operates in a stable and favourable environment (Mochiko, 2017& van Niekerk, 2015).

This is also supported by the below hypotheses:

H3: *Environmental Dynamism moderates the relationship between KMC and Innovation such that organisations in high volatile uncertain environments develop better efficient KMCs to counter the problems they will be facing in their environments than those in less volatile uncertain environments.*

H4: *Environmental Dynamism moderates the relationship between Organisational Learning and Innovation such that organisations in high volatile uncertain environments develop better OL attributes to counter the problems they will be facing in their environments than those in less volatile uncertain environments.*

4.8 Means and Standard Deviations

The table below highlights how the questions on KMC, OL, ED and IP were answered in terms of the means and standard deviation.

Table 4.14: Descriptive Statistics – Organisation A and Organisation B

Descriptive Statistics

	N	Mean	Std. Deviation
KMC1	370	4.31	.798
KMC2	370	4.23	.732
KMC3	370	4.24	.783
KMC4	370	4.39	.800
KMC5	370	4.18	.940
KMC6	370	4.35	.769
Valid N (listwise)	370		

Descriptive Statistics

	N	Mean	Std. Deviation
ED1	370	4.34	.715
ED2	370	3.92	.977
ED3	370	4.09	1.159
ED4	370	4.10	.899
ED5	370	4.17	.814
Valid N (listwise)	370		

Descriptive Statistics

	N	Mean	Std. Deviation
OL1	370	4.19	.859
OL2	370	3.43	.986
OL3	370	3.47	1.057
OL4	370	3.63	1.015
OL5	370	4.01	1.058
Valid N (listwise)	370		

Descriptive Statistics

	N	Mean	Std. Deviation
IP1	370	4.10	.836
IP2	370	4.15	.871
IP3	370	3.97	.845
IP4	370	4.05	.914
Valid N (listwise)	370		

As highlighted from the above tables, the means were all above 3, meaning that majority of the respondents largely agreed to all the questions that were being asked on the questionnaires. In addition, the standard deviation was high which indicated the variability and spread of data across Organisation A and Organisation B in terms of the questions on the questionnaire. The standard deviation above was between 0.7 - 1.15 which was very high.

4.9 Stepwise Regression analysis: KMC, OL, ED vs Innovation

Figure 4.6 Descriptive statistics (Correlations)

Correlations

		InnovationPerformance	Service Provider	Age	Gender	KnowledgeManagementCapabilities	EnvironmentalDynamism	Organisation Learning
Pearson Correlation	InnovationPerformance	1.000	-.129	.057	.003	.563	.452	.649
	Service Provider	-.129	1.000	.003	.049	-.047	-.210	-.139
	Age	.057	.003	1.000	.105	.206	.124	.097
	Gender	.003	.049	.105	1.000	.152	.054	.091
	KnowledgeManagement Capabilities	.563	-.047	.206	.152	1.000	.410	.552
	EnvironmentalDynamism	.452	-.210	.124	.054	.410	1.000	.222
	OrganisationLearning	.649	-.139	.097	.091	.552	.222	1.000
Sig. (1-tailed)	InnovationPerformance	.	.007	.138	.475	.000	.000	.000
	Service Provider	.007	.	.476	.173	.183	.000	.004
	Age	.138	.476	.	.022	.000	.009	.031
	Gender	.475	.173	.022	.	.002	.148	.039
	KnowledgeManagement Capabilities	.000	.183	.000	.002	.	.000	.000
	EnvironmentalDynamism	.000	.000	.009	.148	.000	.	.000
	OrganisationLearning	.000	.004	.031	.039	.000	.000	.
N	InnovationPerformance	370	370	370	370	370	370	370
	Service Provider	370	370	370	370	370	370	370
	Age	370	370	370	370	370	370	370
	Gender	370	370	370	370	370	370	370
	KnowledgeManagement Capabilities	370	370	370	370	370	370	370
	EnvironmentalDynamism	370	370	370	370	370	370	370
	OrganisationLearning	370	370	370	370	370	370	370

From the above figure, it shows the Pearson`s correlation coefficient between every pair of variables starting with the highest coefficient as highlighted below:

Innovation vs OL: $r = 0.649$ (strong relationship)

Innovation vs KMC: $r = 0.563$ (moderate relationship)

Innovation vs ED: $r = 0.452$ (moderate relationship)

It simply shows that OL, KMC and ED all play a crucial in achieving innovation levels in Organisation A and Organisation B as depicted by the positive correlation relationship that exists between these variables. The *p*-values of all the variables above were significant, ($p < 0.000$) in predicting the correlation that exists between KMC, OL and ED towards Innovation. This also concurs with the findings in chapter 2 from various authors (Liu et al., 2013; Schilke 2014; Wu & Chen, 2014; Yayavaram & Chen, 2015) who suggested that KMC, OL and ED play a significant role in determining the levels of Innovation that an organization can attain. Hence, it is important for Organisation A and Organisation B to align their KMCs into their respective short and long-term goals in order to attain success and competitive advantage.

Figure 4.7 Model summary

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.141[a]	.020	.012	.77417	.020	2.468	3	366	.062	
2	.580[b]	.337	.330	.63767	.317	174.462	1	365	.000	
3	.624[c]	.390	.381	.61265	.053	31.429	1	364	.000	
4	.744[d]	.553	.546	.52502	.163	132.640	1	363	.000	2.153

a. Predictors: (Constant), Gender, Service Provider, Age

b. Predictors: (Constant), Gender, Service Provider, Age, KnowledgeManagementCapabilities

c. Predictors: (Constant), Gender, Service Provider, Age, KnowledgeManagementCapabilities, EnvironmentalDynamism

d. Predictors: (Constant), Gender, Service Provider, Age, KnowledgeManagementCapabilities, EnvironmentalDynamism, OrganisationLearning

e. Dependent Variable: InnovationPerformance

The above figure shows the model summary for this research study.

There isn't much of a correlation between gender, organisation and age towards Innovation (0.141) highlighting poor relationship thus represented by an R-square of 0.020 which means that age, gender and the organisations account for less than 1% of the variation on Innovation. However, when we start to consider KMC is used as a predictor on its own, this is the simple correlations between KMC and Innovation (0.580) and its R^2 0.337 meaning to say that KMC accounts for 34% of the variation on Innovation. When ED comes into play, its coefficient is (0.624) and the R^2 is (0.390) or 39% of the variance on Innovation. There has been an increase of 5% meaning to say that ED accounts for the additional 5% hence outlining the importance of ED. When the last predictor is included, OL, its coefficient is (0.744) and R^2 is (0.553) or rather 55% of the variance on Innovation. There has been a further increase of 16% thus resulting in OL accounting for the additional 16%.

As seen from the above the summary model, the difference between the R^2 and the adjusted R^2 minimal (0.553 - 0.546 = 0.07 or 0.7%) indicating that the cross-validity of this model is very good. This change is quite significant ($p < 0.000$) in the difference that has been made by adding new predictors to the model.

Finally, on the summary model, Durbin-Watson statistic has been analysed and its value is depicted as 2.153, which is a good value as it is close to two. This entails that the assumption of independent errors has almost been met.

Figure 4.8 ANOVA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.437	3	1.479	2.468	.062[b]
	Residual	219.361	366	.599		
	Total	223.798	369			
2	Regression	75.378	4	18.845	46.343	.000[c]
	Residual	148.420	365	.407		
	Total	223.798	369			
3	Regression	87.175	5	17.435	46.452	.000[d]
	Residual	136.623	364	.375		
	Total	223.798	369			
4	Regression	123.737	6	20.623	74.815	.000[e]
	Residual	100.061	363	.276		
	Total	223.798	369			

a. Dependent Variable: InnovationPerformance

b. Predictors: (Constant), Gender, Service Provider, Age

c. Predictors: (Constant), Gender, Service Provider, Age, KnowledgeManagementCapabilities

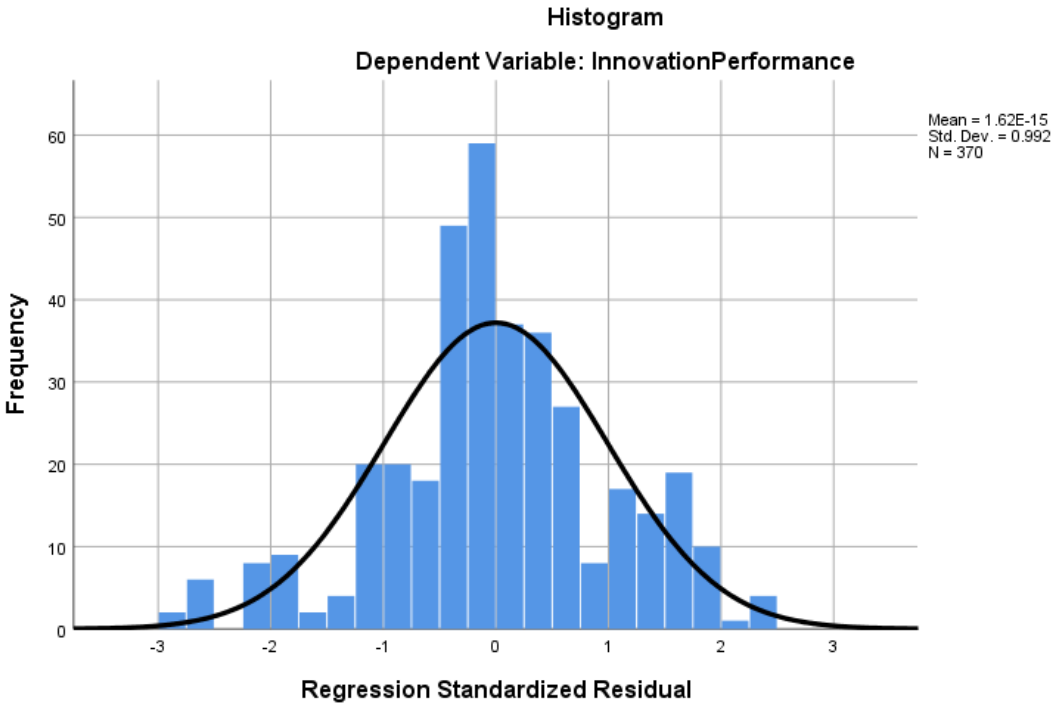
d. Predictors: (Constant), Gender, Service Provider, Age, KnowledgeManagementCapabilities, EnvironmentalDynamism

e. Predictors: (Constant), Gender, Service Provider, Age, KnowledgeManagementCapabilities, EnvironmentalDynamism, OrganisationLearning

As seen from the above ANOVA figure, the initial model has an *F*-ratio of 2.468, ($p < 0.000$) which is greater than 1. The second model has an *F*-ratio of 46.343, which is highly significant, followed by model 3 that has an F-ratio of 46.452, also significant, and lastly model 4 has an *F*-ratio of 74.8.15 quite highly significant as well. Since the *p*-value is ($0.000 < 0.05$), it indicates that there is statistical significant linear relationship between KMC, OL ED and Innovation between Organisation A and Organisation B. From the results, it can be highlighted that all models significantly improved our ability to predict the outcome variable compared to not fitting the model.

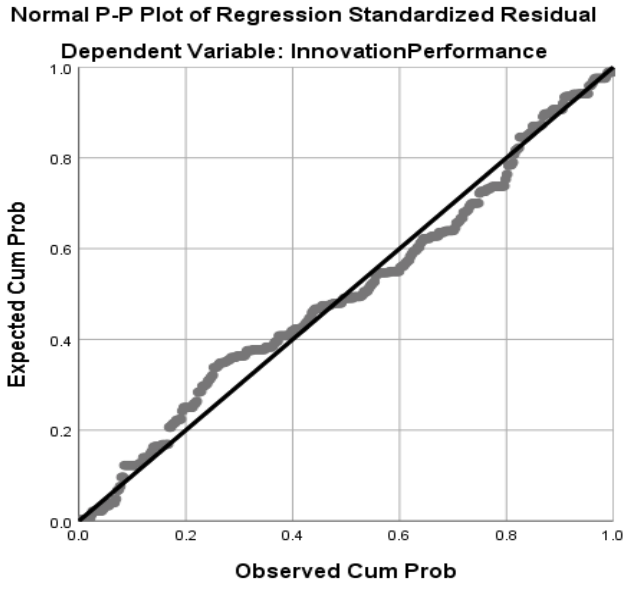
4.9.1 Checking the assumptions

Figure 4.9 Histogram



The figure above shows the histogram of the data for this research study. For the outcome of Innovation, it follows a normal distribution since the histogram is symmetrical and bell-shaped.

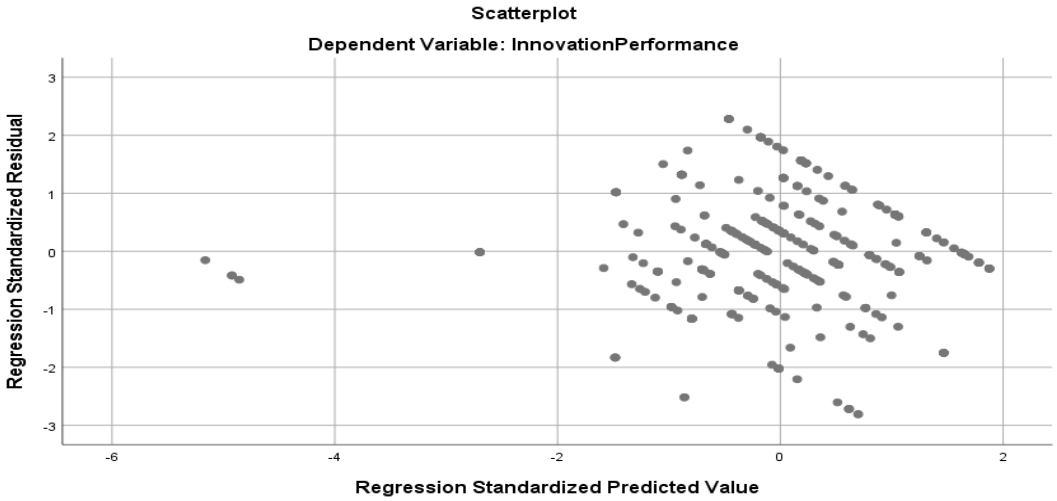
Figure 4.10: Normality (P-P Plot)



The figure above highlights the residuals appearing on the Normal P-P Plot of the Regression Standardised Residual showing a fairly straight-line relationship suggesting that there are no major deviations from normality. This then leads to a conclusion that majority of respondents from Organisation A and Organisation B agree that there is a relationship between KMC, OL, ED and Innovation. This also agrees with the main hypotheses of this research:

H1: *KMC is positively related to Innovation.*
H2: *Organisational learning is positively related to Innovation.*
H3: *Environmental Dynamism moderates the relationship between KMC and Innovation such that organisations in high volatile uncertain environments develop better efficient KMCs to counter the problems they will be facing in their environments than those in less volatile uncertain environments.*
H4: *Environmental Dynamism moderates the relationship between Organisational Learning and Innovation such that organisations in high volatile uncertain environments develop better OL attributes to counter the problems they will be facing in their environments than those in less volatile uncertain environments.*

Figure 4.11: Outliers



The scatterplot above shows a positive association between Innovation and KMC as most of the values are spread out moderately on the positive side whilst some are on the negative side of the scatterplot, with a few outliers (3) in the negative zone. This shows that both sets of employees at Organisation A and Organisation B agree that there is a relationship between KMC, OL, ED and Innovation.

4.10 Process Moderation (Innovation vs KMC, ED)

The table below outlines how ED moderates the relationship between Innovation vs KMC and ED in the two organisations mentioned beforehand.

Table 4.15 Moderation: Innovation vs KMC, ED

```
Model Summary
          R       R-sq        MSE          F        df1        df2          p
      ,6325      ,4000      ,3669    81,3391     3,0000   366,0000      ,0000

Model
              coeff         se          t          p       LLCI       ULCI
Constant    -1,0188      ,5309    -1,9191      ,0558    -2,0628      ,0252
Knowledg      ,9979      ,1354     7,3676      ,0000      ,7316     1,2643
Environm      ,7498      ,1387     5,4052      ,0000      ,4770     1,0226
Int_1         -,1268      ,0335    -3,7892      ,0002     -,1927     -,0610


Conditional effects of the focal predictor at values of the moderator(s):

   Environm     Effect         se          t          p       LLCI       ULCI
     3,6667      ,5328      ,0511    10,4221      ,0000      ,4323      ,6334
     4,3333      ,4483      ,0547     8,1969      ,0000      ,3407      ,5558
     5,0000      ,3637      ,0661     5,5057      ,0000      ,2338      ,4936

Level of confidence for all confidence intervals in output:
  95,0000
```

Hayes (2017) carefully explains the procedures for testing hypotheses in terms of moderation process. According to Hayes (2017), moderation process or interaction is mainly used when there are two or more variables to be tested. The following interpretation has been adapted from (Hayes, 2017) analysis of the process moderation. The table above highlights the moderation output between KMC and ED towards Innovation. From the model summary above, it is clear the model is statistically significant (p-value: 0.000 < 0.05). This indicates that there is a statistically significant positive relationship between the KMC, ED and Innovation. There is a positive strong relationship (R= 0.633) when ED moderates the relationship between KMC and Innovation between the two mobile organisations, Organisation A and Organisation B. The R-square value is 0.400, meaning to say that that only 40% of KMC is accounted for when ED regulates the relationship between Innovation and KMC.

KMC and Innovation

When ED is high, there is a significant strong positive relationship between KMC and Innovation levels in the organisations: b = 0.533, 95% CI [0.432, 0.633], t = 10.422, p = 0.000.

At the mean value of ED, there is a significant positive relationship between KMC and Innovation levels in the organisations: b = 0.448, 95% CI [0.341, 0.556], t = 8.200, p = 0.000

When ED is fairly high, there is still a significant positive relationship between KMC and Innovation levels in the organisations: b = 0.364, 95% CI [0.234, 0.494], t = 5.506, p = 0.000

These results above highlight that the relationship between KMC and Innovation only emerges more in organisations operating in a high ED hence ED moderates the relationship between KMC and Innovation and this also agrees with the original hypothesis of this research:

H3: *Environmental Dynamism moderates the relationship between KMC and Innovation such that organisations in high volatile uncertain environments develop better efficient KMCs to counter the problems they will be facing in their environments than those in less volatile uncertain environments.*

4.11 Process Moderation (Innovation vs OL, ED)

The table below outlines how ED moderates the relationship between Innovation vs OL and ED in the two organisations mentioned beforehand.

Table 4.16 Moderation: Innovation vs OL, ED

```
Model Summary
          R       R-sq        MSE          F        df1        df2          p
      ,7454      ,5556      ,2717   152,5293     3,0000   366,0000      ,0000

Model
              coeff         se          t          p       LLCI       ULCI
Constant     -,9982      ,3628    -2,7516      ,0062    -1,7116     -,2848
Organisa     1,0305      ,0944    10,9123      ,0000      ,8448     1,2162
Environm      ,7700      ,0946     8,1367      ,0000      ,5839      ,9561
Int_1        -,1264      ,0239    -5,2814      ,0000     -,1735     -,0793

Conditional effects of the focal predictor at values of the moderator(s):

   Environm     Effect         se          t          p       LLCI       ULCI
     3,6667      ,5670      ,0351    16,1415      ,0000      ,4979      ,6360
     4,3333      ,4827      ,0386    12,4970      ,0000      ,4067      ,5586
     5,0000      ,3984      ,0475     8,3821      ,0000      ,3049      ,4919

Level of confidence for all confidence intervals in output:
  95,0000
```

The table above highlights the moderation output between OL and ED towards IP.

Hayes (2017) suggests that when the p-value is like this (0.000 < 0.05) the model summary, just like the one above, it will be statistically significant. From the above summary, it is evident that there is a statistically significant positive relationship between the OL, ED and Innovation. There is a positive strong relationship (R= 0.745) when ED moderates the relationship between OL and Innovation between the two mobile organisations, Organisation A and Organisation B. The R-square value is 0.556, meaning to say that that close to 56% of OL is accounted for when ED regulates the relationship between

OL and Innovation

When ED is high, there is a significant strong positive relationship between OL and Innovation levels in the organisations: *b* = 0.567, 95% CI [0.498, 0.636], *t* = 16.142, *p* = 0.000.

At the mean value of ED, there is a significant positive relationship between OL and Innovation levels in the organisations: *b* = 0.483, 95% CI [0.407, 0.559], *t* = 12.497, *p* = 0.000.

When ED is fairly high, there is still a significant positive relationship between OL and Innovation levels in the organisations: *b* = 0.398, 95% CI [0.305, 0.492], *t* = 8.382, *p* = 0.000.

These results above highlight that the relationship between OL and Innovation only emerges more in organisations operating in a high ED hence ED moderates the relationship between OL and Innovation and this also agrees with the original hypothesis of this research:

H4: *Environmental Dynamism moderates the relationship between Organisational Learning and Innovation such that organisations in high volatile uncertain environments develop better OL attributes to counter the problems they will be facing in their environments than those in less volatile uncertain environments.*

4.12 Hypothesis summary

Hypothesis testing is a crucial part of the research study which is important in making sure the outcomes of the research are fulfilled. As highlighted from the previous chapters, the hypothesis of this research study has been tested and the outcome is tabulated below:

Hypothesis	Hypothesised Relationship	Outcome: Reject/Accept
H1	KMC is positively related to Innovation	Accept
H2	OL is positively related to Innovation	Accept
H3	ED positively moderates the relationship between KMC and Innovation.	Accept
H4	ED positively moderates the relationship between KMC and Innovation.	Accept

4.13 Conclusion

This chapter analysed the results that from the two organisations and evidently, all variables were significant. The above tests that proved to show relationships and correlations between the variables that were being tested. The above results have indicated what employees in the two organisations feel and think about the link that exists between KMC, OL, ED and Innovation. The next chapter will discuss the results and findings in more detail including the recommendations that the researcher will highlight to the two organisations.

Chapter 5: Discussion, Limitations, Recommendations and Conclusions

5.1 Introduction

This chapter highlights the overall conclusion of this research by incorporating all the literature and research results highlighted in chapter 4. The primary objective of this study was to find out if there was any link between KMC, OL, ED, and Innovation in organisations. Since literature is in support with the research results, it is clear that there is a link and positive relationship between KMC, OL, ED, and Innovation. This research sought to assess the link that exists between knowledge management capabilities, organisational learning, environmental dynamism and innovation in mobile organisations. There will be a review of the aim and problem statement of this research. Followed by the discussion of theoretical and empirical findings concerning the relationship between the aforementioned variables included in this research study together with the limitations and recommendations as well and lastly, a general conclusion will be provided.

5.2 Summary of literature

From the literature review, the purpose of this research was to establish the link that exists between KMC, OL, ED and Innovation. The research also explored how knowledge in modern organisations plays a role in achieving Innovation. It also explored how and if an organisation has organisational learning traits that encourage employees and employers to learn and engage more with the internal and external environment in order to attain Innovation. And lastly it also explored how ED moderates and regulates organisations into achieving Innovation or not and how organisations counter high or low ED levels. These variables, as seen from this research, work hand in hand towards achieving innovation levels. Since different researches done in the Western/European mainstream relating to KMC, OL, and ED have suggested that there is a link between these variables towards achieving innovation, it is clear from the this research that there is a link. Hence, the literature is in sync with the results that have been collected and interpreted for this research.

Knowledge Management plays an important role in making sure that the innovation levels of any organisation; more so in the tech-organisations in Zimbabwe and South Africa, is attained. 45% of productivity gains come as a result of knowledge management thus highlighting its significance to organisations of today (Economist Intelligence Unit, 2006).

But knowledge management does not function in isolation as illustrated from the earlier chapters. Organisational learning also plays its part in making sure that the employees have the adequate internal and external knowledge to counter any forthcoming problems that the organisation may be facing. Environmental Dynamism, on the other hand, regulates or rather controls the organisation's ability to be innovative hence it's up to the organisation to determine how innovative they should be in order to stay competitive and attain success. So basically, it is evident that these four variables inter-twine and work in hand in hand together and this will be explored in detail later on based on the results. The results of this research aim to outline the deep understanding of how environmental dynamism, as a moderating factor, affects knowledge management capabilities and organisational learning towards attaining innovation levels for organisations. It is important to outline that different organisations operate in different environments, hence the level of knowledge management capabilities, organisational learning and innovation levels is determined but how the organisation counters the dynamic environment in order to attain success. The research findings will now be explored variable by variable, highlighting the effects that each variable poses.

5.3 Summary of results and literature review

From the results gathered, they have duly supported the main purpose of this research which highlights the established link between KMC, OL, ED, and Innovation. Therefore, the relationship between KMC, OL, ED, and Innovation exists. From the results of the correlation, there is a positive relationship between KMC and Innovation; there is also a positive relationship between OL and Innovation; thus, supporting the literature for this research. In terms of moderation, the moderating effect of ED is clearly seen as positive thus concluding that ED moderates the relationship between KMC and Innovation; ED moderates the relationships between OL and Innovation. Organisation A and B operate in different environments but have managed to attain innovation levels in their different capacities that have seen them successful. Most literature available, indicate that most case studies were carried out in the Western/European mainstream thus highlighting the significance of this research study as it was carried out in an African perspective. But overall, these results are a true reflection of how employees feel and view the link that exists between KMC, OL, ED, and innovation in their respective organisations.

KMC on Innovation

According to Pearson and Spearman`s Correlation, there is a positive relationship between KMC and Innovation. These results for this research correspond with other previous researches done such as (Palacios et al. 2009; Yayavaram & Chen, 2015) who concluded that KMC is positively related to Innovation. KMC has a positive effect on Innovation and it enables organisations to change their knowledge base so that they integrate new, existing and old knowledge to their advantage in order to attain superior innovation levels. This assertion also agrees with the main hypothesis of this research study:

H1: KMC is positively related to Innovation.

This finding shows that KMC is a crucial asset to an organisation that is ambitious and innovative. In order for the organisations to be successful, KMCs should be part of the organisational culture and its effective use of KMCs will ensure that the organisation is in a position to acquire, disseminate and apply new and old knowledge to the rest of the organisation so as to maximise their innovation levels. This in turn will create a competitive advantage over their main rivals in the industry. The research of Karimi and Javanmard (2014) highlighted that KMC facilitates the acquisition, dissemination and application of new knowledge and ideas from internal and external sources such that it impacts positively on innovation levels of the organisation. On the other hand, success and innovation is not guaranteed unless the organisation manages to use its KMCs in an efficient way, the organisation needs to make sure everyone in the organisation works towards achieving innovation. Hence it is important for organisations, like Zimbabwe and South Africa, to make sure KMCs are part of their short and long-term strategies so that they become successful and competitive. Therefore, the literature supports this research based on the findings in the previous chapter.

OL on Innovation

According to Pearson and Spearman`s Correlation, there is a positive relationship between OL and Innovation. These results for this research correspond with other previous researches done such as (King, 2009; Wu & Chen, 2014) who concluded that OL is positively related to Innovation. This also agrees with the main hypothesis of this research study as highlighted by the below:

H2: Organisational learning is positively related to Innovation

The research findings of this research show that OL is also important in making sure that innovative levels are attained. A research by Alegre and Chiva (2008) characterised OL with these five dimensions: openness and experimentation; risk-taking; interaction with the external environment; dialogue and teamwork; and participative decision making that will lead to high innovation levels if implemented well by the organisation. According to Garriga et al., (2013), organisations that incorporate these dimensions have a higher chance of maximising their innovation levels. Organisations in Zimbabwe and South Africa need to make sure that these dimensions are well incorporated into their organisational structure in order to make sure innovation levels are attained. Hence, the literature supports this research based on the findings in the previous chapter.

ED moderating the relationship between KMC and Innovation

First of all, this research has outlined the huge role played by KMC in achieving Innovation (Wu & Chen, 2014). Knowledge is a huge asset that any organisation should harness and use effectively in order to achieve innovation levels, especially in mobile organisations where innovation is the main attribute that sets them apart from their competitors. Organisations in Zimbabwe and South Africa, in this particular research, operate in two different environments as highlighted in the results section and the impact of ED is huge in terms of the innovation levels between the two organisations. Since organisations in Zimbabwe operate in a highly unstable environment, it has better effective KMCs which lead to higher innovation levels as the organisations have to constantly find ways to counter the ever-changing external environment so that it remains competitive and successful as well. That being said, it does not necessarily mean that South African organisations do not have better efficient KMCs lined up since it operates in a fairly stable environment as compared to its counterpart in Zimbabwe. It underlines the fact that high ED forces Zimbabwean organisations to be more proactive and robust in terms of their innovation levels by coming up with new information, better ideas and abilities to create new efficient and innovative products whereas low ED does allow organisations South African organisations to still be innovative but not as much as those organisations operating in turbulent volatile environments. Researches by (Ambrosini & Bowman 2009; Schilke 2014) argue that organisations in harsh and turbulent environments have a great opportunity to reinforce their potential which will help organisations to be innovative and counter the challenges in a positive way.

And this is in support of this research which indicates Zimbabwean organisations in a harsh environment have better OL traits as compared to South African organisations which operate in a fairly stable environment.

The effect of KMC on innovation performance is largely high when ED is high. Hence high levels of ED make the positive relationship between KMC and innovation to be more substantial. As a result, Zimbabwe appears to be operating in a highly unstable environment as compared to its counterpart, South africa thus supporting the hypothesis of this study, H3 which state that ED moderates the relationship between KMC and Innovation.

Hence, it is evident, from the tables in Chapter 4 that the mean of Zimbabwe is significantly greater than the mean of South Africa. The main interpretation would be that Zimbabwe operates in a highly dynamic environment that is constantly changing due to various factors of the economy that it operates in whereas South Africa appears to be operating in a fairly stable environment as shown from the above means. In essence, it is quite clear that this research study agrees with previous studies highlighted in the earlier chapters since most studies were carried out in the Western/European mainstream hence it is a significant research study since it is done in an African context. The narrative would conclude that Knowledge Management is very important in organisations of today that are operating in fluctuating unstable environments. Organisations cannot control the external environments but rather they can be innovative in order to counter the constant external environmental changes. Therefore Knowledge Management needs to be harnessed and managed effectively in ways that will be productive and innovative towards achieving the organisations` short and long-term goals.

ED moderating the relationship between OL and Innovation

The results this research established that ED also moderates the relationship between OL and innovation. Organisations with the ability to learn and understate the internal and external environment have the capacity to create and develop new knowledge. This will create an edge over their rivals in terms of becoming successful in terms of innovation levels. But on the other hand, this new knowledge does not guarantee improved innovation ability of the organisation unless the employees learn more about this new knowledge provided the organisation has a conducive environment for this action to take place. The Ambrosini and Bowman, (2009) study on Mark and Spencer is a great example when the organisation had to

align its strategy by making sure that the organisation learns more about the external environment and their customers' needs as well. This resulted in the organisation increasing their market share and enjoying fruitful rewards in the end.

When ED is high, organisations can use knowledge assets at their disposal effectively and use OL in a more effective manner to develop new knowledge that will be beneficial to the organisation. Prior research by Liu et al., (2013) highlights that organisations in developing markets that operate in volatile unstable environments, where high ED dominates, have acquired different and better OL traits and this is in support of this research which indicates Zimbabwe being that organisation in a harsh environment with better OL traits as compared to South Africa which operates in a fairly stable environment. As a result, Zimbabwe appears to be operating in a highly unstable environment as compared to its counterpart, South Africa thus supporting the hypothesis of this research, H4 which state that ED moderates the relationship between OL and Innovation.

Hence, it is evident, from the independent t-test tables in Chapter 4 that the mean of Zimbabwe is significantly greater than the mean of South Africa. The main interpretation would be that Zimbabwe operates in a highly dynamic environment that is constantly changing due to various factors of the economy that it operates in whereas South Africa appears to be operating in a fairly stable environment as shown from the above means. Yayavaram and Chen (2015) state that organisations operating in high uncertain environments tend to develop better efficient OL traits compared to organisations operating in fairly stable environments. This is in agreement with the findings of this research study which highlighted that Zimbabwe operates in highly dynamic environment as compared to South Africa. Because of this, it is quite clear that this research study agrees with previous studies highlighted in the earlier chapters since most studies were carried out in the Western/European mainstream hence it is a significant research study since it is done in an African context. Since the external environmental is always fluctuating, organisations of today should prioritise Organisational Learning as a key asset. Organisations cannot control the external environments but they can rather control how they learn about the internal and external environment. This will result in whether the organisations can be innovative or not in terms of their product and service offerings.

Therefore Organisational Learning should form part of the organisational culture that ensures employees and employers to constantly learn and develop their human skills in order to come up with innovative ideas in order to counter the dynamic environment.

As seen from the above respective Pearson and Spearman Correlations and Moderation analysis, it is evident there is a positive relationship between KMC, OL, ED, and Innovation highlighting their importance in working hand in hand. ED plays a moderating role in determining the levels of Innovation that an organisation can produce and sustain over a period of time as seen with Zimbabwe that operates in a harsh environment hence it has more innovation abilities than South Africa. That being said it does not necessarily mean that South Africa is not innovative but the levels of innovation is quite different due to the differences in ED levels. As a result the main aim of this research study has been achieved and there is a clear link that exists between knowledge management, organisational learning, environmental dynamism and innovation.

5.4 Findings from primary research

The following statements evaluate the degree to which the research objectives have been fulfilled in accordance with research findings of this research. This research clearly highlights the following statements:

- ✓ There is a positive relationship between knowledge management capabilities and innovation in Zimbabwe and South Africa. This relationship allows organisations to acquire, disseminate and apply new and existing knowledge together so that they can be innovative.
- ✓ The relationship between organisational learning and innovation is evident between the two organisations. Organisational learning allows employees to bring new ideas and knowledge in order to maximise the innovative levels.
- ✓ Since organisations operate in an environment that is always changing, the impact of KMC on innovation is moderated by environmental dynamism. This is true as most previous studies acknowledge that environmental dynamism stimulates organisations to be more innovative in order to counter these environmental fluctuations.
- ✓ The impact of organisational learning on innovation is moderated by environmental dynamism. Organisations that have efficient and better organisational traits have an advantage in tackling this dynamic environment. Hence, according to literature and previous studies, organisations in such environments are innovative.

- ✓ From the research findings, there is a statistical significant difference across network providers from the two economies based on environmental dynamism. Zimbabwe and South Africa operate in two different economic environments as highlighted in the results chapter. Therefore this statement concurs with the previous studies.

The above statements are a true reflection of the findings of this research together with the literature and past studies that have been done. Hence, this show how relevant this research study is since it highlights the importance of the link that exists between knowledge management, organisational learning, environmental dynamism and innovation.

5.5 Limitations

As any research, limitations are inevitable to the researcher during the course of this research. These limitations hinder the successful completion of this particular study. Below are some of the limitations faced by the researcher faced whilst carrying out this particular research:

As a cross-sectional study, the research considers respondents from that particular time only. Participants who participated did so voluntarily; therefore, answers to the study tend to be limited in information which can result in low validity resulting in respondent bias. It will be hard to generalise the results of this research study as the study only focused on organisations in South Africa and Zimbabwe only due to the short time frame for this research study. Limited outcomes and responses from respondents since questions are closed-ended. The timing of the snapshot is not guaranteed to be representative.

5.6 Recommendations

For management to make sure that the organisation, as a whole, is working towards achieving innovation, the organisation should make sure the right amount of knowledge is well instilled in the employees of the organisation and that a culture of continuous organisational learning is part of the organisation`s culture that will make sure success is attained. Since it has been established that there is a relationship between KMC, OL, ED and Innovation, organisations, in particular, Zimbabwe and South Africa, need to make sure that their employees have the full understanding of working towards achieving Innovation by making sure that KMCs are put in place and that OL is not isolated as well as this will make sure that the organisation will achieve its goals. In order for this to happen, recommendations need to be put into place and be accounted for as well.

These recommendations can be used by the management of Zimbabwe and South African telecommunication organisations. Below are some of the recommendations and policies that the researcher feels can be implemented effectively:

- ✓ Management of a developing country such as Zimbabwe and developed country as South African need to make sure they take into consideration the views and suggestions of their employees in decision-making. From the questionnaires, it was evident that most employees from the two countries feel left out in terms of bringing forth their ideas and suggestions regarding different issues on KMC, OL, ED, and Innovation. An employee committee can be set up in order to represent the general views of employees that can be presented to the management to help them in decision-making.

- ✓ The dynamic environment that organisations are operating in requires constant learning of the external environment so as to know what to do and what to offer in terms of products and services to the customers. That being said, organisations need to make OL a priority as an organisation with well-learned employees will provide a threat to main competitors. This learning trait may result in being expensive to the organisation but it is beneficial in the long-run and this includes seminars, brainstorming sessions, employee/management exchange programmes with other well-established organisations that are abroad to gain top-tech information and know-how on how to deal with different matters pertaining on how to deal with KMCs, OL, ED towards achieving Innovation. As a research gap, further studies will be needed to explore in detail how environmental dynamism as a moderating variable or as an independent variable can impact the organisation if there are no proper organizational learning infrastructure in place.

- ✓ Most employees do not receive support and encouragement when presenting forward their new innovative ideas. This ends up isolating employees away from achieving the goals of the organisation which can be detrimental towards the success of the organisation. As a way of making sure that employees feel loved and appreciated when presenting their ideas, the board of directors in an organisation need to introduce appraisal techniques that will help motivate employees to present their new innovative ideas.

This support can be weekly, monthly, quarterly appraisal such as an employee of the month, transport, fuel, food allowance for the whole week/month/quarter, etc. Further studies should seek to explore ways on how key employees can be included in the decision-making and the presentation of ideas that will help grow the success of the organisation. This initiative, if implemented well, should motivate employees to be more pro-active and bring innovative ideas as they will be the ones working to make the organisation successful.

- ✓ Employees should be encouraged to interact with the external environment, e.g. competitors, customers, technological institutes, suppliers etc. This will benefit the organisation as they will have more information on what products and services to offer to their market; what the competitor is doing so as to counter that and be innovative in order to gain more market share; to remain more competitive and relevant in the market; to be more innovative so as to become a trendsetter to their rivals.

5.7 Conclusion

The link between KMC, OL, ED, and Innovation has been seen already in the results section. The three variables KMC, OL, and ED work hand in hand in making sure innovation levels are achieved so that organisations can remain competitive in the market. Knowledge is the main variable that plays a vital role in this link as everything emanates from a firm knowledge foundation that is set in organisations as seen thus far from the literature in this study. But it does not work in isolation as seen beforehand, OL is also key in attaining innovation hence organisations should make sure OL traits are part of their organisational culture as seen from Zimbabwe and South Africa who have effective OL traits in their organisations in making sure that their employees have the ability to learn the internal and external environment so as to develop new knowledge that will be key towards achieving innovation. OL also leads to Innovation which is why it is important to make sure OL is used efficiently. ED on the other hands determines or rather regulates whether organisations are innovative or not. A high ED will lead to organisations such as in Zimbabwe, in harsh turbulent environments, to have better KMC and OL traits that will lead to higher innovation levels. A low ED will still lead to organisations such as in South Africa achieving innovation levels but not as high as in the case of Zimbabwe.

This is because organisations like South Africa operate in fairly stable environments which will not require robust innovation levels as compared to Zimbabwe which operate in volatile environments which require constant innovation abilities so as to remain afloat and competitive in the market. A turbulent and competitive environment forces organisations to focus on addressing the increasing new product demands of impatient consumers whilst making sure employees of these organisations make considerable efforts to design, be pro-active and develop new knowledge to offer more innovative products and services (Kamasak et al., 2016).

Hence, the link between KMC, OL, ED, and Innovation is positive and it clearly exists on the basis that everything else is regulated by ED so as to determine the level of innovation that an organisation can maximise and attain. The next chapter will highlight the conclusion of this research study and outline the limitations and recommendations

This research has explored all the necessary aspects that contribute to KMC, OL, and ED leading to Innovation in Zimbabwe and South Africa. As highlighted from the above chapters, there is a positive relationship between KMC, OL, ED and Innovation in Zimbabwe and South Africa. This established link that has been related to in this entire research is crucial in making sure that organisations such as in Zimbabwe and South Africa achieve innovation levels and remain competitive. This basically outlines that for organisations to be innovative, they need to have effective KMCs in place that will make sure necessary and important knowledge is retained in the organisation; OL traits need to be part of the organisational culture so that employees and management learn more about the internal and external environment in order to know what products and services to offer to their customers; high/low ED will make organisations to be proactive and to be flexible as well in terms of being innovative. Innovation does not necessarily mean coming up with products and services but it is a holistic approach that needs to be part of the whole organisation as a whole. Employees need to be given the platform to bring forth innovative ideas that will help sustain the organisation in the long run. Management need to be innovative as well in the way they manage their employees so that everyone is on board when making KMCs, OL and ED can be controlled in a way that will lead to innovation levels being attained.

In concluding, it is of utmost importance for management in Zimbabwe and South Africa to make sure that employees have the full knowledge that is required by the organisation to be successful. Employees need to work in a favourable working environment that will enhance their learning capabilities so that they are able to tackle issues pertaining to high or low ED that poses a threat to the organisation. Management should strive by all means to maintain this relationship as it leads to innovation being achieved which will then give an edge over their main competitors.

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Appendices

Appendix A - Participant Information Sheet

Good day Sir/Madam,

My name is Tinashe Masoka and I am a Masters student by research in the faculty of Commerce, Law and Management at Wits University in Johannesburg. As part of my studies I have to undertake a research project, and I am investigating the link between knowledge management, organisational learning, environmental dynamism and innovation**.** The aim of this research project is to find out how knowledge management together with organisational learning plays a role in a dynamic environment on achieving innovation.

As part of this project I would like to invite you to take part in answering a questionnaire. This activity will involve 20 questions and will take around 5-8 minutes minutes.

You will not receive any direct benefits from participating in this study and there are no disadvantages or penalties for not participating. You may withdraw at any time or not answer any question if you do not want to. The questionnaire will be completely confidential and anonymous as I will not be asking for your name or any identifying information, and the information you give to me will be held securely and not disclosed to anyone else. I will be using a pseudonym (false name) to represent your participation, in my final research report.

If you have any questions afterwards about this research, feel free to contact me on the details listed below. This study will be written up as a research report which will be available online through the university library website. If you wish to receive a summary of this report, I will be happy to send it to you upon request. If you have any queries, concerns or complaints regarding the ethical procedures of this study, you are welcome to contact the University Human Research Ethics Committee (non-medical), telephone + 27(0)11 717 1408, email Shaun.Schoeman@wits.ac.za

Yours sincerely,
Tinashe Masoka
Email: 869403@students.wits.ac.za or sox.masoka@gmail.com
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Supervisor name: DR E. Nkomo
Email: Emmanuel.Nkomo@wits.ac.za
Phone number: +27 79 336 5831

Appendix B - Consent Form



Title of project: Knowledge in modern organisations: Establishing the link between knowledge management, organisational learning, environmental dynamism and innovation. *(A comparative study of mobile companies in Zimbabwe and South Africa)*

Name of researcher: Tinashe Masoka

I …….. agree to participate in this research project. The research has been explained to me and I understand what my participation will involve.

I agree that my participation will remain anonymous YES NO (please circle)

I agree that the researcher may use anonymous quotes in his research report YES NO

I agree that the information I provide may be used anonymously by other researchers following this study YES NO

…… (signature)

…… (name of participant)

10/10/2018

Appendix C - KMC, ED, OL and Innovation Questionnaire

Section A: Demographic details

Please **tick (✓)** one box in each of the sections below:

1. Age

18–30 ☐ 31–40 ☐ 41–50 ☐ 51–60 ☐ 61+ ☐

2. Gender

Male ☐ Female ☐

3. Which organisation do you work for?

Org. A ☐ Org. B ☐

4. Level of Management

Low level Management ☐ Middle level Management ☐ Top middle Management ☐

5. Years of service

Less than one year ☐ 1-5 years ☐ 6-10 years ☐ Above 10 years ☐

Section B: KMC, ED, OL and Innovation questions

Please **tick (✓)** the one number for each question that comes closest to reflecting your opinion about it:

1	2	3	4	5
Totally Disagree	Disagree	Neither agree or disgaree	Agree	Totally Agree

Knowledge Management Capabilities (KMC)

Code Item	Description	1	2	3	4	5
KMC1	Our firm has capability to distribute relevant knowledge in the organisation via various platforms: social software, blogs,wikis, etc.					
KMC2	Our firm has capability to develop knowledge from internal and external knowledge sources.					
KMC3	Our firm has capability to share and transfer relevant knowledge to employees.					
KMC4	Our firm has capability to apply knowledge to develop new products/services.					
KMC5	Our firm has capability to organise and manage knowledge.					
KMC6	Our firm has capability to apply knowledge to solve new problems.					

Please **tick (✓)** the one number for each question that comes closest to reflecting your opinion about it:

1	2	3	4	5
Totally Disagree	Disagree	Neither agree or disgaree	Agree	Totally Agree

Environmental Dynamism (ED)

Code Item	Description	1	2	3	4	5
ED1	In our local market, changes are taking place continuously.					
ED2	Environmental changes in our local market are intense.					
ED3	The technology in this industry is changing rapidly.					
ED4	Our clients regularly ask for new products and services.					
ED5	The volumes of products and services to be delivered change regularly.					

Organisation Learning (OL)

Code Item	Description	1	2	3	4	5
OL1	Employees are encouraged to communicate.					
OL2	Policies are significantly influenced by the employees' views.					
OL3	People here receive support and encouragement when presenting new ideas.					
OL4	Managers in this organisation frequently involve employees in important decisions.					
OL5	People are encouraged to interact with the environment: competitors, customers, technological institutes, suppliers, etc.					

Innovation Performance (IP)

In the last 3 years, compared to our major competitors, our firm is more successful in terms of:

Code Item	Description	1	2	3	4	5
IP1	Success of new products launched.					
IP2	Accelerated speed to market.					
IP3	Number of new product configurations.					
IP4	Improved work methods and processes.					

Source: Adapted from (Kamasak et al., 2016).

Appendix D - Ethics clearance

Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Masoka

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: H18/09/15**
PROJECT TITLE	Knowledge in modern organisations: Establishing the link between knowledge management, organisational learning, environmental dynamism and innovation. (A comparative study of mobile companies in Zimbabwe and South Africa)
INVESTIGATOR(S)	Mr T Masoka
SCHOOL/DEPARTMENT	Wits Business School
DATE CONSIDERED	14 September 2018
DECISION OF THE COMMITTEE	Approved
EXPIRY DATE	16 October 2021

DATE 17 October 2018 **CHAIRPERSON** (Professor J Knight)

cc: Supervisor : Dr E Nkomo

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University. Unreported changes to the application may invalidate the clearance given by the HREC (Non-Medical)

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to completion of a yearly progress report.**

Signature Date

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

Appendix E - Permission letters

ECONET WIRELESS (PRIVATE) LIMITED
No. 2 Old Mutare Road
Msasa
Harare, Zimbabwe
Tel: +263 4 486121/5
Fax: +263 4 486120/486987
Email: info@econet.co.zw
Website: www.econet.co.zw

31 July 2018

Tinashe Masoka
University of Witwatersrand
Johannesburg

Dear Tinashe

RE: REQUEST TO CONDUCT RESEARCH WITHIN ECONET WIRELESS

Thank you for your interest in conducting research within Econet Wireless. We are gald to inform you that your research has been approved.

You will be expected to provide the final copy of the research document, which is duly stamped by the receiving institution and summary of findings (3 pages maximumm) covering executive summary, research findings and recommendations.

Kindly get in touch with me to give you guidance on how to proceed.

Yours faithfully

Darlington Hukuimwe
Head – Talent & Organisational Development

Email: Darlington.Hukuimwe@econet.co.zw
Cell: +263771222110

Executive Directors: Mr Douglas Mboweni (CEO), Mr Kitson Chinaka, Mr Kaz Ito Mukuni, Mr Roy Chimanikire
Non Executive Directors: Dr James Myers (Chairman), Mr Steve Masiyiwa, Mr Herbwork Pemhiwa, Mrs Tracy Mpofu

AliSom COMMUNICATIONS

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0140

16 May 2018

To whom it may concern,

RE: Tinashe Rodney Masoka

We hereby support Mr. Tinashe Rodney Masoka's application, a Masters by Dissertation student from the University of the Witwatersrand, to conduct a survey with our clients for a period of 4 weeks, starting from the period of mid June to mid July.

Permission is granted to Mr. Tinashe Rodney Masoka subject to his obtaining ethical clearance to conduct research from the Ethics Committee of the University of the Witwatersrand, Johannesburg and by abiding to its terms.

I have been informed of Mr. Tinashe Rodney Masoka's line of research and of the nature of the intervention (e.g. Respondents filling in a questionnaire).

Kind regards

Chade da costa

Manageress

Vodacom shop Mall of Africa

011 568 0493

AliSom Communications (PTY) Ltd
T/A Vodacom Shop
Mall Of Africa
Reg. No. 2005/048220/07
VAT No. 4430251944
Shop 1210/1211, Mall Of Africa
Lone Creek Crescent
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P.O Box 1578, Lyttleton, 0140
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AliSom Communications
17 Impala Road
Doringkloof, Centurion
PO Box 15748
Lyttleton
0140

09 October 2018

To whom it may concern,

RE: Tinashe Masoka

We hereby support Mr. Tinashe Masoka's application, a Master's by Dissertation student from the University of the Witwatersrand, to conduct a survey with our employees from the head office and our various AliSom communications branches.

Permission is granted to Mr Tinashe Masoka subject to him obtaining ethical clearance to conduct research from the Ethics Committee of the University of the Witwatersrand, Johannesburg and by abiding to its terms

I have been informed of Mr. Tinashe Masoka's line of research and of the nature of the intervention (e.g. Respondents filling in questionnaires).

Kind regards,

Trish Kgwete

Manageress

011 484 2533/060 997 0380

Appendix F - Sample size estimation 3.4.1

Table 3.1

	Confidence level = 95%			Confidence level = 99%		
	Margin of error			Margin of error		
Population size	5%	2,5%	1%	5%	2,5%	1%
100	80	94	99	87	96	99
500	217	377	475	285	421	485
1.000	278	606	906	399	727	943
10.000	370	1.332	4.899	622	2.098	6.239
100.000	383	1.513	8.762	659	2.585	14.227
500.000	384	1.532	9.423	663	2.640	16.055
1.000.000	384	1.534	9.512	663	2.647	16.317

Source: Israel, (2013).

Appendix G - Customs table

The table below indicates how the respondents answered the questions that were being asked. The questions being asked were on KMC, OL, ED and Innovation.

		Totally Disagree	Disagree	Neither Agree or Disagree	Agree	Totally Agree	Total
KMC1	Count	4	11	21	164	170	370
	Row N %	1.1%	3.0%	5.7%	44.3%	45.9%	100.0%
KMC2	Count	4	0	42	185	139	370
	Row N %	1.1%	0.0%	11.4%	50.0%	37.6%	100.0%
KMC3	Count	3	10	31	176	150	370
	Row N %	0.8%	2.7%	8.4%	47.6%	40.5%	100.0%
KMC4	Count	2	10	32	124	202	370
	Row N %	0.5%	2.7%	8.6%	33.5%	54.6%	100.0%
KMC5	Count	13	1	55	139	162	370
	Row N %	3.5%	0.3%	14.9%	37.6%	43.8%	100.0%
KMC6	Count	4	0	43	139	184	370
	Row N %	1.1%	0.0%	11.6%	37.6%	49.7%	100.0%

		Totally Disagree	Disagree	Neither Agree or Disagree	Agree	Totally Agree	Total
ED1	Count	4	0	29	171	166	370
	Row N %	1.1%	0.0%	7.8%	46.2%	44.9%	100.0%
ED2	Count	13	17	62	171	107	370
	Row N %	3.5%	4.6%	16.8%	46.2%	28.9%	100.0%
ED3	Count	29	6	40	121	174	370
	Row N %	7.8%	1.6%	10.8%	32.7%	47.0%	100.0%
ED4	Count	9	0	79	140	142	370
	Row N %	2.4%	0.0%	21.4%	37.8%	38.4%	100.0%
ED5	Count	4	6	54	165	141	370
	Row N %	1.1%	1.6%	14.6%	44.6%	38.1%	100.0%

		Totally Disagree	Disagree	Neither Agree or Disagree	Agree	Totally Agree	Total
OL1	Count	4	10	53	146	157	370
	Row N %	1.1%	2.7%	14.3%	39.5%	42.4%	100.0%
OL2	Count	13	37	156	106	58	370
	Row N %	3.5%	10.0%	42.2%	28.6%	15.7%	100.0%
OL3	Count	20	38	121	129	62	370
	Row N %	5.4%	10.3%	32.7%	34.9%	16.8%	100.0%
OL4	Count	9	47	88	153	73	370
	Row N %	2.4%	12.7%	23.8%	41.4%	19.7%	100.0%
OL5	Count	10	26	67	115	152	370
	Row N %	2.7%	7.0%	18.1%	31.1%	41.1%	100.0%

		Totally Disagree	Disagree	Neither Agree or Disagree	Agree	Totally Agree	Total
IP1	Count	4	7	67	161	131	370
	Row N %	1.1%	1.9%	18.1%	43.5%	35.4%	100.0%
IP2	Count	4	6	74	131	155	370
	Row N %	1.1%	1.6%	20.0%	35.4%	41.9%	100.0%
IP3	Count	4	5	98	153	110	370
	Row N %	1.1%	1.4%	26.5%	41.4%	29.7%	100.0%
IP4	Count	4	12	85	129	140	370
	Row N %	1.1%	3.2%	23.0%	34.9%	37.8%	100.0%

Appendix H – Process moderation: Innovation vs KMC, ED

```
Run MATRIX procedure:

***************************************************************************
Model  : 1
    Y  : Innovati
    X  : Knowledg
    W  : Environm

Sample
Size:  370

***************************************************************************
OUTCOME VARIABLE:
 Innovati

Model Summary
          R         R-sq          MSE            F          df1          df2
p
      ,6325        ,4000        ,3669      81,3391       3,0000     366,0000
,0000

Model
              coeff         se          t          p       LLCI       ULCI
constant    -1,0188      ,5309    -1,9191      ,0558    -2,0628      ,0252
Knowledg      ,9979      ,1354     7,3676      ,0000      ,7316     1,2643
Environm      ,7498      ,1387     5,4052      ,0000      ,4770     1,0226
Int_1        -,1268      ,0335    -3,7892      ,0002     -,1927     -,0610

Product terms key:
 Int_1    :        Knowledg x        Environm

Test(s) of highest order unconditional interaction(s):
       R2-chng           F        df1        df2          p
X*W      ,0235    14,3581     1,0000   366,0000      ,0002
----------
    Focal predict: Knowledg (X)
          Mod var: Environm (W)

Conditional effects of the focal predictor at values of the moderator(s):

   Environm      Effect          se            t            p         LLCI
ULCI
     3,6667        ,5328        ,0511     10,4221        ,0000        ,4323
,6334
     4,3333        ,4483        ,0547      8,1969        ,0000        ,3407
,5558
     5,0000        ,3637        ,0661      5,5057        ,0000        ,2338
,4936

********************** ANALYSIS NOTES AND ERRORS ************************
Level of confidence for all confidence intervals in output:
  95,0000

W values in conditional tables are the 16th, 50th, and 84th percentiles.
```

Appendix I: Innovation vs OL and ED

```
Run MATRIX procedure:

***************************************************************************
Model  : 1
    Y  : Innovati
    X  : Knowledg
    W  : Environm

Sample
Size:  370

***************************************************************************
OUTCOME VARIABLE:
 Innovati

Model Summary
          R       R-sq        MSE          F        df1        df2
p
      ,6325      ,4000      ,3669    81,3391     3,0000   366,0000
,0000

Model
              coeff         se          t          p       LLCI       ULCI
constant    -1,0188      ,5309    -1,9191      ,0558    -2,0628      ,0252
Knowledg      ,9979      ,1354     7,3676      ,0000      ,7316     1,2643
Environm      ,7498      ,1387     5,4052      ,0000      ,4770     1,0226
Int_1        -,1268      ,0335    -3,7892      ,0002     -,1927     -,0610

Product terms key:
 Int_1    :        Knowledg x        Environm

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      ,0235    14,3581     1,0000   366,0000      ,0002
----------
    Focal predict: Knowledg (X)
          Mod var: Environm (W)

Conditional effects of the focal predictor at values of the moderator(s):

   Environm     Effect         se          t          p       LLCI
ULCI
     3,6667      ,5328      ,0511    10,4221      ,0000      ,4323
,6334
     4,3333      ,4483      ,0547     8,1969      ,0000      ,3407
,5558
     5,0000      ,3637      ,0661     5,5057      ,0000      ,2338
,4936

********************** ANALYSIS NOTES AND ERRORS ************************
Level of confidence for all confidence intervals in output:
  95,0000

W values in conditional tables are the 16th, 50th, and 84th percentiles.
```