ADDIS ABABA UNIVERSITY
COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCE
SCHOOL OF INFORMATION SCIENCE

Factors Affecting Knowledge Sharing in Ethiopian Electric Utility (EEU)

By

Raey Zewdie Tirfie

June 2018

Addis Ababa, Ethiopia

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Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Science in Information Science

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Name and signature of Members of the Examining Board

Name	Title	Signature	Date
_____	Advisor	_____	_____
_____	Examiner	_____	_____
_____	Examiner	_____	_____

DECLARATION

I, Raey Zewdie Tirfie, hereby declare that the work which is presented in this thesis entitled with "Factors Affecting Knowledge Sharing in Public Service Institution: The Case of Ethiopian Electric Utility" is an original work of my own for degree of Master in Information Science which dispensed under the guidance of my supervisor Dr. Gashaw Kebede. The work has not been presented for any academic qualification in the University. I also confirm that a proper credit has been given to the work of others within this thesis where references have been made.

Signature: _____ Date: 6/6/2018

The thesis has been submitted for examination with my approval as a University advisor.

Signature: _____ Date: 6/6/2018

Gashaw Kebede (PhD)

Advisor

DEDICATION

This work is dedicated to the Lord of the World and to all my beloved Families.

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I am grateful and indebted to my advisor Dr. Gashaw Kebede. He has been a huge support and a mentor throughout to my thesis writing process. With his considerable knowledge and wisdom, he helped me in organizing and adding a greater depth to my study. I must also give recognitions to the head office management body and other staffs in four Addis Ababa branches (Regions) who paved the way to expedite the data collection and other important supports with fully responsibility and concern.

I am again grateful and indebted to my all instructors who gave me the light and pointing the way towards my MSc achievement. I believe that everybody around natures me in one or other way, therefore, I would like to thank my class mates and team members for their positive influence and best friendship during my time I have had with them.

Last but not least, I am indebted and grateful to my daughter for her continuous support to complete my study.

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Abstract

In today's globalized economy knowledge becomes the most important intellectual resource in public service organization that has to be shared. Public organizations without KS could not achieve their goals and objectives. However, the past findings show that KS in organization can be affected by different factors. In other words, effective KS among employees in public institutions becomes a significant management challenge for providing excellent government service to customers at all levels. EEU is rehiring the retired staffs which signifies that the institution is not retaining these individuals' knowledge. In addition to this, EEU is outsourcing its major functions in search of others' expertise to fill its knowledge gaps which is again might be the obscene of knowledge retention. Therefore, whether knowledge sharing does really exist in EEU and factors affecting the practice are yet to be known.

Thus, this study was intended to identify factors affecting KS in order to improve KS practice and then make sure knowledge retention in EEU. To meet this objective, the study set up two research questions. These are: i) Factors impacting KS practice ii) KS mechanisms implemented in EEU. Regarding to the methodology, the research followed a correlational study to examine the presence of association between KS practice and KS factors (Individual, Organizational, NOK and Technological). The data instrument was closed-end self-administered questions and semi-structured face-to-face one-to-one guide for interview.

In the case of sampling technique, a proportionate stratified random sampling technique followed by a systematic random sampling method was used for the quantitative study and a purposive sampling method for interview. Then, Pearson's and Spearman's correlation analysis methods were used to understand the presence and degree of association between KS factors and KS practice variable. To meet this, thirteen alternative hypotheses were claimed and quizzed the association of the above study variables. A population Null hypothesis (H_O) testing method used as a verification or rejection to all study's premises. Moreover, one factor MANOVA analysis was also done to insight the impact of independent variables on dependent variables. Finally, the Qualitative data was grouped in to seven thematic areas and analyzed as proper in text.

The study indicates that Trust and Job Satisfaction from Individual dimension, Structure, Culture, Rewards and Recognitions from Organizational dimension, complexity and Tacitness from NOK, ICT infrastructure, ICT know-how and ICT Tools type from Technological dimension have association with KS practice in EEU. Except employees' awareness, Office Layout and personality, all the remaining KS factors have a significant positive influence on KS practice in EEU that spans from very weak to moderate. The MANOVA findings also reaffirm this statement that Trust, Job Satisfaction, Structure, Culture, Work Process, Rewards and Recognitions, NOK, ICT Infrastructure, ICT Know-How are factors that influence KS practice in EEU.

EEU uses training, meeting, email, storytelling and direct observation to share knowledge though KS practice is a real challenge for it. However, EEU does not use even these KS mechanisms in a regular base and systemic way to facilitate KS activities among employees. About 60% of the respondents ratify that EEU does not retain knowledge from skilled and experienced staffs before they leave the office. The interviewees also confirmed that EEU is rehiring the retired staffs to get their knowledge invariably due to lack of strategy or system intended for knowledge retention.

This study contributes important findings to be considered by decision-making bodies at EEU to improve KS activities and knowledge retention. Therefore, EEU can establish secession plan to retain knowledge, implement motivational scheme for employees involved in due of KS and invest on ICT infrastructure intended and suitable for KS with a feature of capturing, storing and disseminating. Then, increase its employees' ICT know-How to enable them capable in use of the ICT infrastructure effectively.

Keywords: Knowledge, Knowledge Management, Knowledge sharing, Factors affecting Knowledge sharing, Knowledge Retention

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List of Acronyms

EEP----------Ethiopian Electric Power
EEU----------Ethiopian Electric Utility
EHS and Q----------Environmental Health Safety and Quality control
ERP----------Enterprise Resource Planning
HO----------Head Office
ICT----------Information Communication Technology
IT ----------Information Technology
KM----------Knowledge Management
KMS----------Knowledge Management Systems
KS----------Knowledge Sharing
KT----------Knowledge Transferring
MANOVA----------Multivariate Analysis of Variance
NOK----------Nature of Knowledge
PE ----------Process of Excellence
PGS---------- Property and General Service
SEIC----------Socialization, Externalization, Internalization and Combination
UEAP----------Universal Electrification Access Program

CHAPTER 1: INTRODUCTION

1.1. Background

The world's economy has become more globalized due to global networks and fast changing technology (Aramburu & Rivera, 2009; Temtim, 2014). Subsequently, it is widely observed that the society we live in has been gradually turning into a "knowledge society" (Toffler 1990; Nonaka, 1994). While the world moves towards a knowledge-based economy, "knowledge is being considered as the main driver of this new economy and regarded as a factor of production together with land, labor and capital" (Nassuora, 2011). This phenomenon in return has brought the ever-increasing importance of knowledge in contemporary society that calls for a shift in our thinking concerning innovation in large business organisations (Nonaka, 1994). This dynamics of the modern market, fast development of science and technology and changes in society require a new attitude to the management of organisations and new requirements (Wang & Noe, 2010; Najibullah, et al., 2012).

According to Sedziuviene & Vveinhardt (2009), the recognition of the importance of intellectual resources in modern world proves the appearance of new management branches, concentrating attention to one subject-knowledge. Omotayo (2015) also asserts that the emergence of knowledge-based economies has placed an importance on effective management of knowledge. As a result, in recent years the importance of KM has been widely recognized as the foundations of industrialized economies shifted from natural resources to intellectual assets known as knowledge (Omotayo, 2015). One can define KM as a method to improve performance, productivity, competitiveness, business efficiency improvement, sharing and using intra-organizational information, a tool to improve decision making, a way to acquire the best methods, a way to mitigate the costs and finally a myopia to make the organization more innovative (Danayifard et al., 2011; Abzari et al., 2014).

The main aim of KM is to transform individual knowledge into organisational knowledge through acquiring, sharing, storage, disseminating, exploitation and innovation of knowledge. An effective KM due attention to four key components namely: Knowledge, People, Processes and Technology (Desouza, 2011; Gates, 2000; Sedziuviene & Vveinhardt, 2009).

Therefore, the realization came that processes and technology alone are not enough to drive an organisation but its human force (staffs) are integral pivot in organization's success. In essence, the focus of KM is to connect people, processes, and technology for leveraging knowledge (Omotayo, 2015).

Among these KM process components, KS is an important aspect of KM (Riege, 2005; Najibullah, et al., 2012; Asrar-ul-Haq & Anwar, 2016). KS throughout the organisation enhances existing organisational business processes, introduces more efficient and effective business processes and removes redundant processes. It is a discipline that promotes a collaborative and integrated approach to the creation, capture, organisation access and use of an enterprise's knowledge assets (Bhojaraju, 2005). Ipe (2003) cited in Asrar-ul-Haq & Anwar (2016) defines KS as the transference of knowledge among individuals, groups, teams, departments, and organisations. For individual employees, KS is talking to colleagues to help them get something done better, more quickly, or more efficiently. For an organisation, KS involves capturing, organizing, reusing, and transferring experience-based knowledge that resides within the organisation and making that knowledge available to others in the business (Calantone et al., 2002; Scarbrough, 2003; Line, 2007).

Though KS is a critical step in KM, it will not be achieved if there is a lack of KS culture, trust and motivations (Wang & Noe, 2010; Najibullah, et al., 2013). Moreover, knowledge that is not well managed and shared corrodes easily (Riege; 2005; Najibullah et al., (2012). Cabera and Cabera (2002) cited in Andreasian (2013) also argue that without KS a company could not reach their goals and competitiveness. According to Orlikowski (1992), model of technology and a study by Van den Brink (2003) in Ismail & Yusof (2008), three dimensions are proposed as the key factors in KS: individual, organisation and technology. Riege (2005) cited in Norulkamar & Norulkamar (2014) says that past finding shows knowledge sharing in the organisation can be affected by different factors. These factors can be also classified as internal and external barriers. The internal barrier comes from the individually driven considerations such as attitude, intention and behavior towards knowledge sharing. The external barrier comes from the organisational context such as the environment and culture, working condition, management support, organisational structure and technological challenges.

Perjanik (2016) views the electrical utility industry as similar to other large and mature industries, such as telecommunications, manufacturing, and the medical field in terms of the employment longevity and expertise held by their personnel. In exploring processes that reduce the loss of knowledge in the electrical utility industry specifically, Bishop (2005) in Perjanik (2016) states that once the types of knowledge at risk of being lost are determined, utilities need to develop improved methods for sustaining and passing on the knowledge held by its employees. Therefore, it is crucial for the organisation to constantly run the KS among its employees so that at any time even when one employee leaves, the rest will be able to continuously maintain the knowledge needed for the job (Robertson, 2004; Amezenech, 2014).

Generally, organisations which have better capability to manage and use their knowledge resources do better in the long term (De Long and Fahey, 2000; Curado & Bontis, 2011; Temtim, 2014). However, effective KS among employees is a significant public management challenge for providing excellent government service to constituencies at all levels (Davenport & Prusak, 1998; Ismail & Yusof, 2012). These are Organisational level (Ayodele, Yao, Haron, & Juan, 2016) and Technological level (Szulanski, 2003; Andreasian & Andreasian, 2013). Therefore, to fully leverage their knowledge-based assets, organisations must first understand factors that affect KS at individual level (Sharrat & Usoro, 2003; Temtim, 2014), Meaning, successful KS in any organisation entails identifying those factors that could inhibits and easily increase KS behavior due to the difficulties in incorporating individual's knowledge into broad organisation knowledge (Ayodele et al., 2016).

The electrical utility industry operates in an environment that is facing an ever-increasing demand for the delivery of reliable energy, more stringent financial and regulatory constraints, a maturing asset inventory, and an aging workforce (Perjanik, 2016). Similarly, EEU is one of the local government public service providers in Ethiopia that is engaged in the business of distributing and selling electrical energy and maintenance of the system in proprietary at national level with a growth of the sector itself in service area, customer's size, finance, and human capital. EEU is restructured recently as an electric utilities provider which shoulder huge and critical duties that needs to manage its intangible resource, "knowledge" (Najibullah, et al., 2012; Omotayo, 2015), to achieve its goal.

1.2. Statement of the Problem

The biggest value of knowledge that can be achieved in an organisation is when it is shared to increase job performance and facilitate new knowledge creation (Cohen, 1990; Ismail & Yusof, 2012). In the business world, failing to share knowledge can bring huge financial losses. According to International Data Corp, the US-based market intelligence and advisory firm, Fortune 500 Companies lose at least $31.5 billion a year through deficiencies in knowledge sharing (Babcock, 2004; Najibullah, et al., 2012). Although knowledge sharing is the core activity of KM and considered to be of a vital importance to organizations, there are factors affecting it (Szulanski, 2003). Islam & Khan (2014) argue, a wide range of factors influencing KS practices have been identified. These factors could be summarized in to the following three categories: Technological factors, Organisational factors and Individual factors (Riege ,2007; Ardichvili et al., 2006; Cabrera et al.; 2006; Paroutis & Saleh, 2009).

Technology can enhance the sharing of knowledge by reducing the restriction pertaining to distance and time (Supar, 2012) by offering big access to large amounts of data and information (Supar, 2012; Norulkamar & Norulkamar, 2014). The application of electronic mail, internet, collaboration technologies, bulletin boards and news groups can support the distribution of knowledge throughout an organisation. Therefore, without a solid IT infrastructure, an organization cannot enable its employees to share information on a large scale (Mahmoudsalehi et al., 2012). Regarding to organisational dimension, five variables are suggested: organisational structure and organisational culture (Syed et al., 2004; Sharrat & Usoro, 2003; Ismail & Yusof, 2012), rewards and recognitions, work process and office layout (Lee & Al-Hawamdeh 2002; Ismail & Yusof, 2012).

Organisational structure can influence KM processes through shaping patterns and frequencies of communication among organisational members, stipulating locations of decision-making and affecting efficiency and effectiveness in implementing new ideas. A decentralized structure has often been seen as facilitative to KM success where as a high centralization inhibits interactions among organisational members then reduces the opportunity for individual growth and advancement, and prevents imaginative solutions to problems (Mahmoudsalehi et al., 2012).

Culture is the combination of shared history, expectations, unwritten rules, and social customs that compel behaviors. It is the set of underlying beliefs that, while rarely exactly articulated, are always there to influence the perception of actions and communications of all employees (Mahmoudsalehi et al., 2012) and makes it one of the biggest challenges to knowledge sharing (Skyrme, 1997; Ismail & Yusof, 2012).

According to Bartol & Srivastava (2002) cited in Ismail & Yusof (2012) states that rewards can be in terms of monetary incentives and non-monetary incentives. To encourage and create a consistent KS, monetary values such as financial rewards, salary increment and the like should be used (Davenport & Prusak, 1998; Ismail & Yusof, 2012). Employees should be capable to contribute KS as part of their work process.so that KS should be included in work process (Davenport & Prusak2000; Ismail & Yusof, 2012). Davenport & Prusak (2000) cited in Ismail & Yusof (2012) suggest that corporate planner, architects, academics and executives should giveconsideration and creative thought to the issue of office design which hinder corporate world citizens from working with knowledge. It has becoming more important for them to design offices that can encourage socialization between employees to share knowledge. Therefore, question whether office layout encourages social interaction among employee or not Lee & AlHawamdeh (2002; Ismail & Yusof, 2012).

Often time, knowledge is hoarded by individuals because they consider it as personal valuable asset, which sustain their relevance in an organisation (Hashim & Tan, 2015; Ayodele et al., 2016). These individuals have a unique, personal store of knowledge gained from life experiences, training, and formal and informal networks of friends and professional acquaintances (USA department of army, 2012; Amezenech, 2014). One crucial constraint of these individuals to KS is the behavior and attitude to share their knowledge (Koriat & Gelbard, 2014; Ayodele et al., 2016). According to Ismail & Yusof (2012), awareness (Lee & Al-Hawamdeh, 2002), trust (Sharratt & Usoro, 2003), personality (Awad & Ghaziri, 2004) and job satisfaction (Engstrom, 2003) are the individual factors. The other KS factor is NOK. According to Narteh (2008) cited in Al-Salti (2009), the ease of knowledge sharing is influenced by the nature and the characteristics of the underlying knowledge.

As cited in Perjanik (2016), Dzekashu and McCollum (2014) noted that "knowledge loss resulting from an aging workforce continues to be a management nightmare" and that operational continuity poses a threat to organisations not equipped to address the situation. Sandhu et al.,(2011) also argue that knowledge as a central resource of the government service, effective KS among employees is a significant public management challenge for providing excellent government service. Currently, EEU is rehiring the retired staffs to get their knowledge which might be the problem of the institution to retain individual's knowledge. In addition to this, Temtim (2104) identified that Indiviual, Organizational and Technological are factors affecting KS in Commercial Bank of Ethiopia. However, the syudy was a qualitative research which has limitation of generalizability of the research's finding. Since it is a single case study research, its findings cannot be generalizable to other organization Temtim (2014). In line with this, the study focused on determining factors affecting KS and knowledge retention in EEU. To this end, this study seeks or attempts to answer the following research questions.

1.3. Research Questions

The following research questions or interrogative statements have been formulated to guide the study:

1. What are the factors affecting KS among employees in EEU?
2. How does intra-organisational KS take place in EEU?

1.4. Objective of the study

1.4.1. General Objectives

The general objective of the study is to identify factors affecting KS in order to improve KS practice and then make sure knowledge retention in EEU.

1.4.2. Specific Objectives

The following specific objectives are devised to meet the general objective of the study.

1. To assess the behavior, awareness and attitude of employees towards KS
2. To assess the organisational roles and the impact of ICT infrastructure and employees' ICT know-how on KS.

3. To assess existing KS practices in EEU by investigating the KS mechanisms put in place

4. To develop KS Framework using the identified KS constructs

1.5. Significance of the Study

According to EEP, the purpose of the EEU is to engage in the business of distributing and selling electrical energy in accordance with economic and social development policies and priorities of the government. Again, the EEU sets its vision as to energize Ethiopia's sustainable growth and enabling the country to be power hub of Africa. This implies that the EEU has been expected to manage hug responsibilities to achieve its objectives. Therefore, EEU employees should have competent knowledge and skills to deliver their duty effectively and efficiently.

However, this research finding shows that there is no effective KS practice among employees in EEU due to individual, organizational and technological factors. Therefore, this finding will help EEU management staffs and other employees to become aware of the existing problem, this in turn can assist EEU to initiate KS strategy and follow its implementation. Finally, the KS Framework will help in understanding the existing KS practice in EEU developed based on the research's findings and again to implement KS initiative in EEU. Consequently, this study could add up its contribution in the future to retain knowledge that leads to increase its organizational performance and customer satisfaction.

1.6. Scope of the Study

This study focused on exploring the factors affecting KS and KS mechanisms in head office, East Addis Ababa Region, West Addis Ababa Region, North Addis Ababa Region and South Addis Ababa Region of EEU. The study population was also limited to permanent staffs of the above offices.

1.7. Operational Definitions

Knowledge Sharing: - is the process through which one unit is affected by the experience of another.

Trust: - is the degree to which employees believe and use the knowledge gained from their co-workers or a worker need to believe that his or her knowledge will not to be misused.

Awareness: - is the degree to which employees are aware of the importance of knowledge sharing and benefits he/she could gain from sharing.

Personality: - is the degree to which employee's attitude is extrovert, confident and feel secure to share knowledge.

Job Satisfaction: - is the degree to which an individual satisfy with his/her own daily work.

Organizational Structure: - is the number of levels of authority in an organization.

Organizational Culture: - means assumptions, beliefs or values that are shared.

Reward and Recognition: - rewards mean financial incentives and recognitions means non-financial incentives.

Office Layout: - is the physical design of office layout either open or close can influence knowledge sharing in organization.

Work Process: - is the processes and procedures involved when doing a particular job.

ICT infrastructure: - is the presence of an up to date physical ICT infrastructure that helps employee create and share knowledge in organization.

ICT Know-how: - is the computer literacy of worker in public sector in doing their daily works.

ICT Tools Type: - are tools such as e-mail, groupware and computer-based information systems that facilitate knowledge sharing in public organizations.

Nature of Knowledge: - defines the complexity and tacitness or sticky nature of knowledge

CHAPTER 2: LITERATURE REVIEW

2.1. Overview

We are living in a knowledge-based society where knowledge is a key strategic resource for organisations that used to increase individual and organisational capability for new-innovation and quickly solve problems (Temtim, 2014). It means knowledge becomes the fundamental resource that allows people function intelligently (He & Wei, 2009; Mesfin, 2017). In other words, knowledge becomes a strategic asset of any ideal organisation for its survival and proficiency in the rapidly changing or dynamic economic environment (Lee & Roth, 2009) that urges the firms to give attention for knowledge capital like other organisational resources (Bosua and Venkitachalem, 2013; Omotayo, 2015).

In organisations, knowledge becomes embedded not only in documents or repositories, but also in organisational routines, processes, practices, norms and cultures (GroÈnhaug and Nordhaug, 1992; Omotayo, 2015). This implies that performance in various parts of the organization is enhanced when people communicate information, effective practices, insights, experiences, preferences, lessons learned, as well as common and uncommon sense (GroÈnhaug and Nordhaug, 1992; Omotayo, 2015).

2.2. Perspectives on Knowledge

2.2.1. What is Knowledge

De Long and Fahey (2000) in Al-Salti (2009) defined knowledge as “a product of human reflection and experience”. Epetimehin and Ekundayo (2011) in Omotayo (2015), states that knowledge is the insights, understandings, and practical know-how that people possess. Davenport & Prusak (1998) in Gagn (2009) also define knowledge as “A fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. The most common definition of knowledge is the top tier in a three-level hierarchy that begins with ‘data’ (i.e. raw facts), which, when processed, yields ‘information’ (Moteleb and Woodman, 2007), which, when combined with experience and judgment and used in decision-making, becomes ‘knowledge’ (Kidwell et al., 2000; Arisha, 2013).

Knowledge has been argued and seen from various perspectives. Firstly, knowledge can be considered as a state of mind, an object, a process, a condition of having access to information and a capability. Secondly, knowledge can be seen as a state of mind that centers on enhancing individuals' personal knowledge so they can effectively apply knowledge to the organisation's requirements (Nonaka et al., 2000). Wang and Noe (2010) in Omotayo (2015) define knowledge as "information processed by individuals including ideas, facts, expertise, and judgment relevant for individual, team, and organisational performance." In this perspective, knowledge is regarded as a thing or object, independent of human action (Haslinda & Sarinah, 2009). The term 'knowledge' as advanced by both Nonaka and Takeuchi (1995) in Ingari & Ali (2017), it originates from the human brain in the form of 'tacit' (personal and context-specific) knowledge needs to be expressed by explicit measures to achieve its 'explicit' (formal and systematic form).

Gagn (2009) cited in Davenport & Prusak (1998) states it as an invisible or intangible asset, in which its acquisition involves complex cognitive processes of perception, learning, communication, association and reasoning. As Bradley (1991) and McMurray (2002) define in Rivera et al., (2009), knowledge is the mixture of experience, values, expert and contextual information that help the people or organisation in the evolution and absorption of new experience. Knowledge can be characterized as the ability of the enterprise or agency to raise productivity and develop new products and market for easy competition against other organisations. Whereas Bhatt (2002) in Nassuora (2011) argues that knowledge can be a very difficult concept to define since knowledge is a word we all use it in everyday in our life. Although this classical hierarchy is widely accepted in the literature, some authors still question the relationship between information and knowledge, pointing out that the distinction between them is vague in many contexts (Hicks et al., 2006, Faucher et al., 2008; Arisha, 2013).

2.2.2. Types of Knowledge

Knowledge may reside in two levels within an organisation: knowledge that resides within the individuals in the organisation and knowledge that exists at the collective level, independent of individuals (Spender, 1996; Islam & Khan, 2014). This knowledge has been categorized to different kinds based on structural features, preliminary features, purpose, application and conceptual level. According to (Wolf, 1990 and Backman, 1199; Sheikhi, 2015). Knowledge can also be divided in practical (know-how), theoretical (know-way) and strategically (know-what).

Again it is possible to divide knowledge into coded (know-what), customary (know-how), scientific (know-why) etc. There can also be commercial knowledge, which in the realities of market is applied in the work of organisations and their reciprocity with the environment (Bell, 1998; Sedziuviene & Vveinhardt, 2009).

Table 2.1: Classification of Knowledge in KM

Milner B. Z.	Goldstein G. J.	Sevage C. M.
Cognitive knowledge (know what)	Declarative knowledge (knowledge-zero)	To know why (to understand the importance of the actions, influence the environment)
Applied skill (know how)	Procedure knowledge (know-how)	To know, that (to understand the essence of the information using intuition and experience)
Systematic understanding (know why)	Reason knowledge (know why)	To know who (to have necessary knowledge)
Personal creativity motivation (want to know why)	Condition knowledge (know-when)	To know how (to have obvious and not obvious knowledge about the performance of the task)
	Relation knowledge (know with)	To know where (to imagine the optimal environment)
		To know when (to make prognosis for suitable time and moment)

Source: Ignatjeva, 208; Sedziuviene & Vveinhardt, 2009

On the other hand, Nonaka & Konno (1998) argue that there are two kinds of knowledge: explicit knowledge and tacit knowledge. Explicit knowledge can be expressed in words and numbers and shared in the form of data, scientific formulae, specifications, manuals and the like. This kind of knowledge can be readily transmitted between individuals formally and systematically. According to Polanyi in Nonaka (1994), explicit knowledge refers to the knowledge available in a documented form, with the provision for easy codification (Nonaka and Takeuchi, 1995; Dharmasiri, 2011). Explicit knowledge can be expressed in formal and systematic language and shared in the form of data, scientific formulae, specifications, manuals and such like. It can be processed, transmitted and stored relatively easily (Nonaka et al., 2000).

Whereas, tacit knowledge is the knowledge that exists in the beliefs of the individual, the culture of people, and experience within the organisation (Chigada, 2014; Ncoyini & Cilliers, 2017). It is deeply rooted in action, commitment, and involvement in a specific context. Tacit knowledge means the knowledge the individuals possess that is hidden inside their “black boxes” (Nonaka and Takeuchi, 1995; Dharmasiri, 2011). "Tacit" knowledge has a personal quality, which makes it hard to formalize and communicate (Nonaka, 1994; Nonaka et al., 2000).

Tacit knowledge is deeply rooted in action, procedures, routines, commitment, ideals, values and emotions. It `indwells' in a comprehensive cognizance of the human mind and body. It is difficult to communicate tacit knowledge to others, since it is an analogue process that requires a kind of `simultaneous processing' (Nonaka et al., 2000). It is what Polanyi describes, as "we know more than we can tell." Despite being personal, embedded, contextually bounded, tacit knowledge can still be managed using appropriate methods (Johnson, 2007; Arisha, 2013).

Though other classifications of knowledge exist like ontological and epistemological dimensions (Nonaka, 1994), Nonaka and Tekeuchi (1995) cited in Perjanik (2016) extends upon Polanyi's idea and offered the most often cited explicit and tacit knowledge classification. Al-Qdah and Salim (2013) in Perjanik (2016) states that this taxonomy is the most widely accepted knowledge taxonomy in knowledge-based research.

Table 2.2: Comparison between tacit and explicit knowledge

Attributes	Tacit Knowledge	Explicit Knowledge
Representation	Knowledge which have no equivalent words which is embedded with the knower	Knowledge which can be verbalized and codified. It is found in documents, databases, etc
Consciousness	Unconscious. Tacit knowledge is automatic, requires little or no time or thought like ride a bicycle	Conscious. Requires logical thinking.
Scope	Tacit knowledge tends to be local. Highly contextualized	Through codification and structuring, specific local attributes are excluded and removed.
Acquisition	Acquired through hands on practice. It contains technical skills which are hard to verbalize	Acquired through formal education or structured study and logical reasoning
Structure	Unstructured. Tacit knowledge is technical or cognitive and is made up of mental models, values, beliefs, perceptions, insights and assumptions.	Structured. Explicit knowledge is carefully structured and codified knowledge in books, manuals, mathematical expressions, and databases
Communication	Shared through direct interaction between the knower and the knowledge seeker. People use metaphors, analogies, demonstrations and stories to convey their tacit knowledge to others.	Easily communicated through documents, databases, etc. IT is extensively used to communicate explicit knowledge. It can be communicated in the absence of the knower

Source: Smith, 2001; Nonaka, 1994; Lam, 2000; Temtim, 2014

2.2.3. The Knowledge Hierarchy or Continuum

The knowledge hierarchy depicts the conventional concept of knowledge transformations, where data is transformed into information, and information is transformed into knowledge (Hicks et al., 2006).

Variations on this central theme include Tuomi (1999) in Hicks et al. (2006), proposes an inverted hierarchy. His position is that knowledge is required to represent information, which must be done to store data. Nissen (2000) in Hicks et al. (2006) extends this concept with a model containing two hierarchies. One hierarchy models the view of the knowledge seeker, whereas the second hierarchy is inverted and represents the view of the knowledge creator. From the seeker's perspective, data is placed in context to create information, and information that becomes actionable is knowledge. From the creator's perspective, knowledge is necessary to create information, which in turn is necessary to create data. These transformations are not mutually exclusive (Hickse et al., 2006).

An extension to the knowledge hierarchy is expressed by Ackoff (1998) in Hicks et al. (2006) defines data as symbols, information as data that are processed to be useful, knowledge as application of data and information to answer ''how'' questions, understanding as the ability to answer ''why'' questions, and wisdom as evaluated understanding. Instead of a hierarchy, Kakabadse et al. (2003) in Hicks et al. (2006), views data, information, realization, action/reflection, and wisdom as a ''chain of knowledge flow''. Realization refers to information put to productive use. Action/reflection is reflective and integrative thought and the will to act. Through action/reflection, one may gain wisdom. As understanding and wisdom are unlikely to be possessed by computers (Ackoff, 1996) in Hicks et al. (2006), consider them dimensions of personal knowledge.

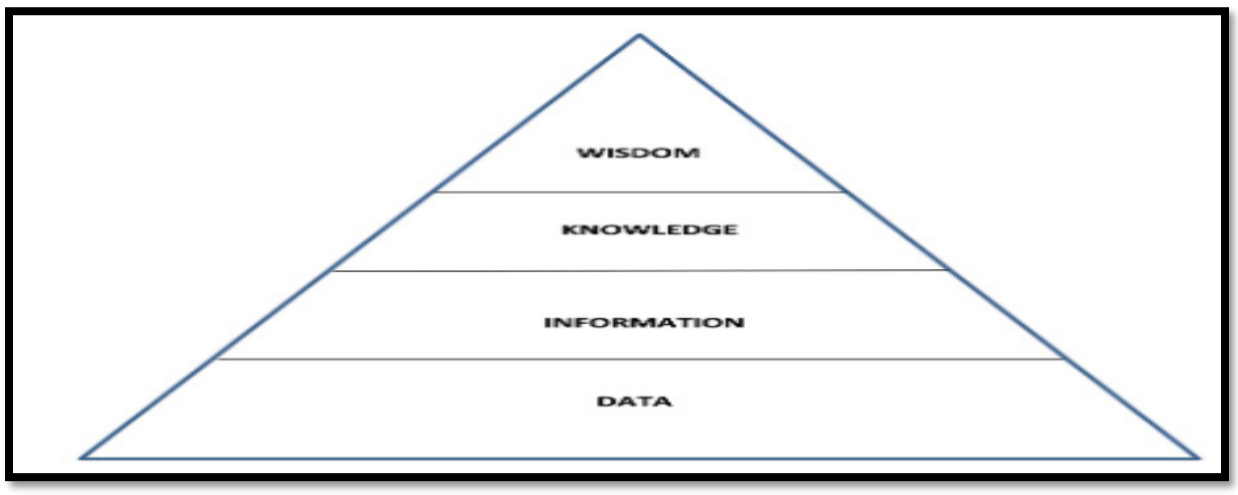

Figure 2.1: The Knowledge Pyramid.

Source: ((Ackoff, 1968; E.Jennex & E.Bartczak, 2013)

The knowledge hierarchy can be used to predict the action-ability and volume of each tier in the hierarchy. Knowledge is the most actionable level but the rarest, where data is the least actionable level but has the greatest volume (Nissen, 2000; Hicks et al., 2006). The most common definition of knowledge is the top tier in a three-level hierarchy that begins with 'data' (i.e. raw facts), which, when processed, yields 'information' (Moteleb and Woodman, 2007; Arisha & Ragab, 2013), which, when combined with experience and judgment and used in decision-making, becomes 'knowledge' (Kidwell et al., 2000; Arisha & Ragab, 2013). Information is data organized in a way to be meaningful to users (Ipe, 2003; Temtim, 2014). Data is simple collection of symbols about real world objects and events. It does not have relevance until it is processed and organized in a way to give meaning (Karadsheh, et al., 2009; Temtim, 2014).

According to Islam & Khan (2014), knowledge is the product of information in the hierarchical view and information becomes knowledge when it is analyzed, processed and placed in context. Nonaka (1994) argues that knowledge gives a capability to interpret and apply information in actions and it also includes the person's emotions, beliefs and judgments but information is static and non-humanistic (Blair, 2002; Temtim, 2014). Data are objective facts that describe an event without any judgment, perspective, or context, and it becomes information when meaning is added to it (Mohamed, 2014). Information is the result of processed and structured data; it can be transferred into knowledge by means of connections, comparison, conversation, and consequences. Knowledge derives from information which is anchored in the beliefs, views, and obligations of its holders, (Ramdhania, 2012; Ncoyini & Cilliers, 2017). Finally, wisdom is an act of placing in to frame-work or nomological net that allows the knowledge to be applied to different and not necessarily intuitive situations (E.Jennex & E.Bartczak, 2013).

2.2.4. Resource View of Knowledge

According to Ingari & Ali (2017), while knowledge is increasingly being viewed as a commodity or intellectual asset, there are some paradoxical characteristics of knowledge that are radically different from other valuable commodities. These knowledge characteristics include the following: using knowledge does not consume it; sharing knowledge does not result in losing it; knowledge is abundant, but the ability to use it is scarce; much of an organisation's valuable knowledge walks out the door at the end of the day.

Chen et al. (2004) cited in Sheikhi (2015) argue, in today's competitive conditions, knowledge becomes the most important capital, which is replaced by physical and financial capitals and it can be represented as intellectual capital (McMurray, 2002; Rivera et al., 2009).

Bhojaraju (2005) also describes that to serve customers well and remain in business companies must: reduce their cycle times, operate with minimum fixed assets and overhead (people, inventory and facilities), shorten product development time, improve customer service, empower employees, innovate and deliver high quality products, enhance flexibility and adoption, capture information, create knowledge, share and learn. None of this is possible without a continual focus on the creation, updating, availability, quality and use of knowledge by all employees and teams, at work and in the marketplace. Generally, the resource view of knowledge implies that the firm considers knowledge as the most important strategic resource to achieve their organisational objectives (Grant, 1996; Temtim, 2014).

2.3. Knowledge Management

KM is a fast growing discipline with a lot of ideas yet to be tested, issues to resolve, and a lot of learning have to be discovered (Beckman, 1999; Ismail & Yusof, 2008). The term KM is older than twenty years. The American scientist Wiig was the first to use the term "manage the knowledge" in 1986 during the international conference in Switzerland. However, the beginning of KM as a separate scientific branch dates back to 1993, when in Boston the first conference devoted to KM problems in organisations took place. Nowadays this is one of the most popular and quickly developing management tendencies, the appearance of which was presupposed by many reasons. KM refers to a range of practices and techniques used by organisations to identify, represent and distribute knowledge, know-how, expertise, intellectual capital and other forms of knowledge for advantage, reuse and sharing of knowledge and learning across the organisation (Sedziuviene & Vveinhardt, 2009).

Alavi and Leidner (1999) in Haslinda & Sarinah (2009) define KM as "a systemic and organizationally specified process for acquiring, organizing, and communicating both tacit and explicit knowledge of employees so that other employees may make use of it to be more effective and productive in their work". O'Dell et al. (1998) in Haslinda & Sarinah (2009) define it as "a conscious strategy of getting the right knowledge to the right people at the right time and

helping people share and put information into action in ways that strive to improve organisational performance". According to Beckman (1999) in Haslinda & Sarinah (2009), KM is "the formalization of and access to experience, knowledge and expertise that create new capabilities, enable superior performance, encourage innovation and enhance customer value". As cited in Ingari & Ali (2017), King (2009) defines KM is the planning, organizing, motivating, and controlling of people, processes and systems in the organisation to ensure that its knowledge-related assets are improved and effectively employed.

According to Sedziuviene & Vveinhardt (2009) KM means the formalization of any word, fact or example, event, rule, hypothesis or model that strengthens understanding and actions, the access to practical experience, expert data, which creates new possibilities to stimulate innovation and raise the price of usage. American Productivity and Quality Center (APQC) in Mahmoudsalehi et al. (2012) states that, KM is an emerging set of strategies and approaches to create, safeguard, and use knowledge assets (including people and information), which allows knowledge to flow to the right people at the right time so they can apply these assets to create more value for the enterprise. As Sternberg and Grigorenko (2000) states in Sedziuviene & Vveinhardt (2009), KM is a technological system, which connects strategic and useful knowledge and evaluations, which make it easier to create an effective cooperation and well-times decision-making.

KM is an audit of "intellectual assets" that highlights unique sources, critical functions and potential bottlenecks, which hinder knowledge flows to the point of use (Bhojaraju, 2005). The management of knowledge is given two main tasks. The first one is to use knowledge effectively, the second one - to create new products and services; develop innovations (Mahmoudsalehi et al., 2012). This asserts that organizations' competitive advantage increasingly depends on effective KM and organisational learning (Riege, 2005; Gagn, 2009). The KM framework consists of components such as identification, acquisition, development, dissemination and use of knowledge (Debowski, 2006; Dharmasiri, 2011).

According to Al-Hawamdeh (2003) in Ismail & Yusof (2012), there are five important dimensions in KM activities:

- Knowledge capture;
- Knowledge creation;
- Knowledge use (leverage);
- Knowledge Sharing; and
- Knowledge retention.

Moreover, KM is a set of management activities aimed at designing and influencing processes of knowledge creation and integration including processes of sharing knowledge that has been emerged as one of the most influential new organisational practices (Nassuora, 2011). So, KM is an eminent management approach that can be successfully applied across institutional settings through the optimal use of the extensive knowledge present in organisations such as local government institutions (Gafoor & Cloete, 2010; Schutte & Barkhuizen, 2015). KM is of critical importance in maintaining and boosting local government performance and sustainable superior service delivery in today's rapidly transforming global environment (Lai et al., 2014; Schutte & Barkhuizen, 2015).

2.3.1. Knowledge Management Life Cycle

A knowledge information cycle can be envisaged as the route that information follows in order to become transformed into a valuable strategic asset for the organisation via a KM cycle (Dalkir, 2005). According to Dalkir (2005), there are four major approaches to KM cycles presented from Meyer and Zack (1996), Bukowitz and Williams (2000), McElroy (2003) and Wiig (1993). Based on these four KM cycles, Dalkir (2005) has developed an integrated KM cycle model that comprises of three stages outlined in Figure 2.2.

- Knowledge capture and/or creation
- KS and dissemination
- Knowledge acquisition and application

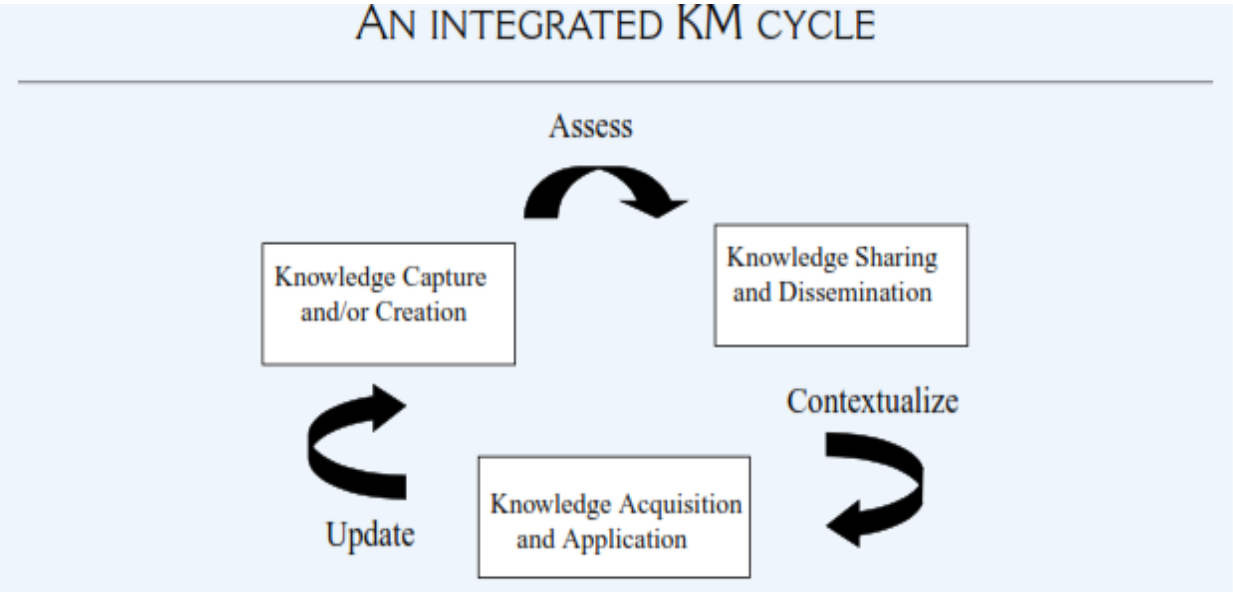

Figure 2.2: Knowledge Management Life Cycles.

Source: (Dalkir, 2005)

Knowledge capture refers to the identification and subsequent codification of existing (usually previously unnoticed) internal knowledge and know-how within the organisation and/or external knowledge from the environment. Whereas, knowledge creation is the development of new knowledge and know-how (innovations) that did not existed previously within the company. When knowledge is inventoried in this manner, the next critical step is to present an assessment against selection criteria that will follow closely the organisational goals. In the transition from knowledge capture/creation to KS and dissemination, knowledge content is assessed. Knowledge is then contextualized in order to be understood ("acquisition") and used ("application"). This then feeds back into the first one in order to update the knowledge content. The KM cycle is then reiterated as users understand and decide to make use of content (Dalkir, 2005).

In addition to this, the knowledge life cycle, knowledge capture, knowledge development, knowledge sharing, and knowledge utilization have all become strategic necessities for organizations to integrate with their information technology capabilities (Lee and Hong, 2002; Liao et al., 2006). Subsequently, due to the potential benefits of knowledge sharing many organizations have invested considerable money into knowledge management initiatives and systems, which use the latest technology to collect, store and share knowledge (Wang & Noe, 2010; Najibullah, et al., 2012).

2.3.2. Knowledge Management System

A KMS is a managerial, technical and organisational system structured to support the implementation of KM within an organisation (Massa and Testa, 2009; Arisha & Ragab, 2013). KMS being introduced and implemented to improve knowledge sharing (Ncoyini & Cilliers, 2017). According to Arisha & Ragab (2013), in addition to a hybrid approach there are three approaches identified to designing a KMS: codification, personalization and people-finder. The codification ('hard') approach focuses on the capturing and storage of knowledge in electronic repositories, making it available for retrieval and, due to its nature, tends to pursue explicit knowledge (Shin, 2004; Arisha & Ragab, 2013). This approach adopts a 'people-to-documents' strategy, seeking to reuse knowledge by investing in building robust databases and rewarding employees who contribute to the information technology (IT)-based KMS (Hansen et al., 1999; Arisha & Ragab, 2013).

In contrast, the personalization ('soft') focuses on the sharing of knowledge through face-to-face social interaction activities such as communities of practice and story-telling (Shin, 2004; Arisha & Ragab, 2013). This approach adopts a 'person-to person' strategy aimed at sharing knowledge and nurturing innovation, and so is seen as the more suitable for the dissemination of tacit knowledge (Massa and Testa, 2009; Arisha & Ragab, 2013). In this approach, moderate investment is made in IT as its function is only to connect people, and more investment is made in recruiting highly qualified human resources and rewarding them for sharing their knowledge (Hansen et al., 1999; Arisha & Ragab, 2013). KM and information technology (IT) have common objectives of transforming local government organisations into more agile, innovative, effective, and more responsive forms (Ozlen, 2013; Ncoyini & Cilliers, 2017). The People-Finder instead aims to map the location of this knowledge within the organisation (BecerraFernandez, 2000; Arisha & Ragab, 2013).

KMS support organisations to identify relevant information needed for business processes, and assist to strengthen interagency collaborations (McNabb, 2007; Ncoyini & Cilliers, 2017). Various mechanisms and structures, often technology-supported, have been proposed to facilitate this endeavor including Intranets (McKinlay, 2002; Lam & Chua., 2009)Chua, 2009) how organisations can capture knowledge from experts within the organisation, and formalize and package knowledge assets for dissemination and reuse by other employees (Markus, 2001; Lam

& Chua., 2009). Designing a system to share knowledge in local government organisations require that a combination of people, technology, processes, and information be established. In local government, KMS enable organisations to develop and maintain the ability to organize and store invaluable knowledge to be used for business purposes every day (McNabb, 2007; Ncoyini & Cilliers, 2017).

2.4. Knowledge Sharing

In KM, a basic concept is that knowledge can be shared (Nonaka and Takeuchi, 1995; Liao et al, 2006). The biggest value of knowledge that can be achieved in an organisation is when it is shared because it can increase job performance and facilitate new knowledge creation (Cohen, 1990; Ismail & Yusof, 2012). It is extremely important for organisations to create a culture of KS so that they will not depend on the knowledge of a few and everyone in the organisation would benefit from the knowledge the firm has enabled (Ramirez 2011; Ingari & Ali, 2017). According to Nonaka (1994), KS is a means through which knowledge is communicated to potential users. It is also a means through which individual level knowledge is converted into organisational knowledge. Award & Ghaziri (2007) state, KS is a daily routine activity of employees in the work place whether the organisation has an explicit procedure on it or not. Moreover, Bartol & Srivastava (2002) in Temtim (2014) states that KS is individuals sharing of organisational relevant information, ideas, suggestions and expertise with one another.

Encyclopedia of KM (Schwartz, 2006) in Paulin & Suneson (2012) describes, KS is the exchange of knowledge between and among individuals and within and among teams, organisational units and organisations. KS implies that individuals mutually adjust their beliefs and actions through more or less intense interactions (Krogh, 2002; Liao, Fei, & Chen, 2006). It is also the process of mutually exchanging knowledge and jointly creating new knowledge (van den Hooff & de Ridder, 2004; GAGN, 2009). KS is a discipline that promotes a collaborative and integrated approach to the creation, capture, organisation access and use of an enterprise's knowledge assets and capturing a company's most valuable Knowledge (asset) and distributing it effectively across the enterprise (Bhojaraju, 2005). Rivera et al. (2009) discuss KS as the process where individuals mutually exchange both tacit and explicit knowledge, and jointly create a new knowledge.

KS involves the process of individuals communicating their personal intellectual capital to others and the process of consulting colleagues in a work place to encourage them to share their intellectual capital for individual organisational benefits (Alhalhouli et al., 2014; Ayodele et al., 2016). Therefore, it is a fundamental part in KM is to spread and make knowledge accessible and usable within or between chosen organisations (Paulin & Suneson, 2012). As Dharmasiri (2011) states, KS is a set of behaviors that involve the exchange of information or assistance to others. It is therefore essential to inculcate the sharing of both tacit and explicit knowledge among workers within the organisation itself (Syed et al., 2004; Ingari & Ali, 2017). According to Zhang, Li & Shi (2005) in Ismail & Yusof (2012), sharing knowledge in organisation serve four benefits:

I) Increase intellectual capital structure in the organisations;

ii) Change individual competitiveness into organisational competitiveness, minimize organisational dependency on individual and reduce the possibility of loss of employee because of changing place of work;

iii) Change organisational competitiveness into individual competitiveness in which individual can gain knowledge from organisational repository. This will increase individual competitiveness;

iv) The cost to gather knowledge in organisation will be reduced compare to those available in the market

Knowledge sharing can be studied in organizational, collective and individual levels. Organizational and collective knowledge sharing roots in the behavior of people and conducts their behavior (here, it means motivation for knowledge sharing (Argore & Ingram, 2000; Abzari et al., 2014). Generally, KS concerning about the notions of the ‘right knowledge’, the ‘right people’ and the ‘right time’ demonstrate the need to identify the required knowledge among the large amount of information an organisation creates every day (Duffy, 2000; Arisha & Ragab, 2013), who holds it, and when and how it should be shared (Arisha & Ragab, 2013).

2.4.1. Knowledge Sharing Mechanisms

KS is part of the KMS of an organisation (Abdel-Rahman & Ayman, 2011; Nassuora, 2011). This means KS process in local government can be supported by the Internet as it has the ability to provide users with access to any information anywhere and anytime (Canzano and Grimaldi,

2012; Ncoyini & Cilliers, 2017). Chigada (2014) in Ncoyini & Cilliers (2017) acknowledges that KS systems enable organisations "to integrate vast assortments of disparate application interfaces, controls and data sets, thus enabling information sharing and centralized management of information and knowledge across the organisation". Organizations' investments in ICTs provide employees with a wide range of tools to support their knowledge sharing needs (Alavi & Leidner, 2001; Yuan, Zhao, Liao, & Chi, 2013). As a result, KS throughout the organisation enhances existing organisational business processes, introduces more efficient and effective business processes and removes redundant processes.

According to Becerra-Fernandez and Sabherwal (2010) cited in Ncoyini & Cilliers (2017), systems that facilitate knowledge exchange are groupware, web-based access to data and databases, and repositories that include best practices databases and lessons learned systems. Furthermore, intranets also facilitate KS in organisations. Web portals are another KS mechanism used for KS as they provide links to other sites and offer opportunities to search other pieces of information (Canzano and Grimaldi, 2012; Ncoyini & Cilliers, 2017). An organisation might have any combination of both long-standing tools, such as e-mail, telephones, teleconferencing, intranets, group decision support systems, or databases, and newer interactive social media tools, such as wikis, blogs, online communities, social networking sites, and micro-blogging (Yuan, Zhao, Liao, & Chi, 2013).

On the other hand, based on tacit and explicit classification of knowledge, Bartol and Srivastava (2002) cited in Temtim (2014) identify four major mechanisms for individuals to share their knowledge in the organisation: (1) contribution of knowledge to organisational databases; (2) sharing knowledge in formal interactions within or across teams or work units; (3) sharing knowledge in informal interactions within individuals; and (4) sharing knowledge within communities of practice, which are voluntary forums of employees around a topic of interest. This implies that knowledge is shared either through facilitation of the organisation or through individual initiation.

2.4.2. Factors Affecting Knowledge Sharing

Research shows that knowledge sharing plays a vital role in organization's general performance improvement (Keshavarzi, 2007; Wijk et al., 2008) and value generating activity in organizations (Keshavarzi; 2008; Abzari et al., 2014). More effective companies in knowledge sharing have shown higher levels of productivity (Ballen et al, 2005; Abzari et al., 2014). Despite this fact, the biggest challenge in KM is to ensure participation by the people or employees in the knowledge sharing, collaboration and re-use to achieve business results (Bhojaraju, 2005). Knowledge sharing in organisations is not as simple as Nonaka's simple matrix suggests; it can be very complicated and complex (Haslinda & Sarinah, 2009). It is also asserted that effective knowledge sharing among organizational members is complicated (Ridge, 2005; Abzari et al., 2014).

A review of the literature revealed that there is a broad range of factors that influence the effectiveness of knowledge acquisition and sharing (Al-Salti, 2009). Some variables hinder KS in the organisations. These variables are known as KS Barriers (Sharma et al., 2012). Based on Orlikowski (1992) in Ismail & Yusof (2012), model of technology and a study by Van den Brink (2003), there are three dimensions as the key factors in KS: individual, organisation and technology. Moreover, the nature and the characteristics of the underlying knowledge (Narteh, 2008; Al-Salti, 2009) is also another KS factor. Therefore, in order for organisations to fully leverage their knowledge-based assets, they must first understand factors (Sharrat & Usoro, 2003; Ismail & Yusof, 2012).

2.4.2.1. Individual factors

One major aspect in the effective management of knowledge deals with the sharing of these resources between individuals and departments in the organisation (O'Dell & Grayson, 1998; Supar, 2012). The idea, that most of the knowledge and experience in an organisation belongs not to the organisation itself, but to its employees, has received growing recognition in the KM community during the last decade. In an organisation, knowledge is shared through the interactions of the employees. Often, this knowledge has been acquired in experiences (Santos et al., 2012).

Human nature recurs throughout KM literature as a serious barrier to full and efficient usage and creation of knowledge in an organisation. In an essence, at a fundamental level, individuals create knowledge. An organisation cannot create knowledge without individuals rather it supports creative individuals or provides a context for such individuals to create knowledge (Cabrera et al., 2006; Gavrilova & Andreeva, 2012).

Organisational knowledge creation, therefore, should be understood in terms of a process that "organizationally" amplifies the knowledge created by individuals, and crystallizes it as a part of the knowledge network of organisation. First, the KS process is linked to the tacit component; inherent in the knowledge an individual possesses (Spender, 1993; Gavrilova & Andreeva, 2012). Second, there are motivational and other individual barriers that may inhibit knowledge-sharing processes from both the knowledge owner's and knowledge recipient's sides (Husted and Michailova, 2002; Gavrilova & Andreeva, 2012). Nonaka (1994) argued that the key to the success of KS was ultimately individual and organisational commitment. However, KS may not happen if employees are not willing to share their knowledge and expertise. This might be due to lack of trust between employees in KS activities.

Trust means that the knowledge will not be accurate from the source or individual will not be a misuse this knowledge forms the recipient side (Stauffer, 1999; Norulkamar & Norulkamar, 2014). In addition to this, sharing knowledge is something difficult to an individual and normally people may not share knowledge unless it is useful and beneficial to them. Individual barriers refer to personal barriers such as lack of communication skills, lack of social networks, differences in culture, lack of time, lack of trust, lack of motivation, lack of awareness of the benefit of KS, lack of interaction, fear of not receiving recognition (Riege, 2005; Jain et al., 2007; Ling et al., 2009; Sandhu et al., 2011). Trust and communication between staff have the most significant relationship with KS (Ayodele et al., 2016). when individuals share organizationally relevant experiences and information with one another, it significantly increases the resources of an organisation and decreases time wasted in trial-and error (Lin, 2007; Ingari & Ali, 2017).

However, according to Dikotla et al. (2014:849) in Ncoyini & Cilliers (2017), government employees do not share their knowledge and experience in the private sector as their counterparts do. Therefore, this unwillingness of KS causes fatalities for organisational survival (Lin, 2007; Ingari & Ali, 2017).

As a lack of motivation, a knowledge source may be reluctant to share crucial knowledge for fear of losing ownership, a position of privilege, superiority; it may resent not being adequately rewarded for sharing hard-won success; or it may be unwilling to devote time and resources to support KS. Moreover, from the lack of absorptive capacity perspective, recipients might be unable to exploit outside sources of knowledge; that is, they may lack absorptive capacity (Cohen and Levinthal, 1990; Szulanski, 1996). Such capacity is largely a function of their preexisting stock of knowledge (Dierickx and Cool, 1989; Szulanski, 1996) and it becomes manifest in their ability to value, assimilate and apply new knowledge successfully to commercial ends. Sandhu et al. (2011) assert that organisations realized that main success of KS lies in the hands of people.

2.4.2.2. Organisational factors

- ***Organisational Structure***

Organisational structure refers to how people and task in an organisation is arranged to ensure the work done (Encyclopedia of Management, 2000; Ismail & Yusof, 2012). It also indicates an enduring configuration of tasks and activities (Ismail & Yusof, 2012). Organisational structure comprises the organisational hierarchy, rules and regulations, and reporting relationships (Herath, 2007; Mills & Smith, 2011) and is considered a means of co-ordination and control whereby organisational actors can be directed towards organisational effectiveness (Mills & Smith, 2011). Milovanović (2011) describes organisational structure as a model of allocation of human and other resources, responsibilities and authorities in an enterprise. The forms are project and team oriented where members of team are empowered to make many decisions in order to meet project goals. On the other hand, we have a bureaucratic form of organisation based on hierarchical relations between managers and their subordinates. This form of organisation is not suitable for KS because it prevents free flow of knowledge in an enterprise.

That means more flexible forms of organisational structure are appropriate for KM. As cited in Mahmoudsalehi et al. (2012), Chen and Huang (2007) discuss that organisational structure is usually categorized into three elements including formalization, centralization, and integration. More recently, categorized into four elements including centralization, formalization, complexity, and integration ((Lee and Grover, 2000; Mahmoudsalehi et al., 2012).

Formalization refers to the degree to which jobs within the organisation are standardized and the extent to which employee behavior is guided by rules and procedures. In organisations with high formalization, there are explicit rules and procedures, which are likely to impede the spontaneity and flexibility needed for internal innovation. Standardization would eliminate the possibility that members engage in alternative behaviors and remove the willingness for members to discussions on considering alternatives. As tasks are preprogrammed by the organisation, there is less need for organisational members to discuss how work is done. Conversely, in organisations with low formalization, job behaviors are relatively unstructured and members have greater freedom in dealing with the demands of their relevant tasks.

Centralization refers to "the extent to which decision-making power is concentrated at the top levels of the organisation". A decentralized structure has often been seen as facilitative to KM success. High centralization inhibits interactions among organisational members, reduces the opportunity for individual growth and advancement, and prevents imaginative solutions to problems structure can influence KM processes through shaping patterns and frequencies of communication among organisational members, stipulating locations of decision-making and affecting efficiency and effectiveness in implementing new ideas. Complexity refers to the degree to which different functions are distinguished with respect to goals, task orientation, and degree of autonomy. Integration describes the degree to which the activities of separate players in the organisation can be coordinated through formal coordination mechanisms. Traditionally, public sector organisational structures are compartmentalized and this complicates the information and KS between units and different levels in organisations (Cong & Pandya, 2003; Ismail & Yusof, 2012).

- ***Organisational Culture***

Culture is the combination of shared history, expectations, unwritten rules, and social customs that compel behaviors. It is the set of underlying beliefs that, while rarely exactly articulated, are always there to influence the perception of actions and communications of all employees (Mahmoudsalehi et al., 2012). Milovanović (2011) also argues that organisational culture is set of opinions which are shared by all members of some social unit such as organisational unit and enterprise in whole and the values, practices and assumptions that motivate members of an organisation to act and behave in a particular manner (Alavi et al., 2005; Al-Salti, 2009). Moreover, organisational culture can be defined as the shared, basic assumptions that an organisation learnt while coping with the environment and solving problems of external adaptation and internal integration that are taught to new employees as the correct way to solve those problems (Park et al., 2004; Ingari & Ali, 2017).

Therefore, an effective organisational culture can provide support and incentives as well as encourage knowledge-related activities by creating suitable environments for knowledge exchange and accessibility (Janz & Prasarnphanich, 2003; Wanjau & Kenneth, 2014). As suggested by (Ngoc, 2005; Wanjau & Kenneth, 2014) an organisation must have a strong culture that values trust, openness, and sociability to stimulate people's interactions and KS. An organisational culture that supports KS can lead to more effective achievement because instilling a culture of standardizing and maintaining information is critical to achievement (Lai and lee, 2007; McManus and Loughridge, 2002; Ingari & Ali, 2017). This confirms that organisational culture to be believed as the most significant factor in effective KM (Gold et al., 2001; Wanjau & Kenneth, 2014). Therefore, organisational culture in the context of KM is considered as a complex collection of values, beliefs, behaviors and symbols that influences KM in organisations (Ho, 2009; Mills & Smith, 2011).

Each organisation has its own culture, which gradually develops overtime to reflect the organisation's identity in two dimensions: visible and invisible (Al-Alawi et al., 2007; Ingari & Ali, 2017). The visible dimension of culture is reflected in the espoused values, philosophy and mission of the firm while the invisible dimension lies in the unspoken set of values that guides employees' actions and perceptions in the organisation (McDermott and O'Dell, 2001; Ingari & Ali, 2017).

Hence, a knowledge-friendly culture is regarded as one of the most important factors impacting KM and the outcomes from its use (Ho, 2009; Mills & Smith, 2011). Thus, the culture of an organisation has the potential to facilitate or constrain KS and acquisition. For example, a flexible and innovative organisational culture can facilitate a learning environment and constantly promote employees to capture and utilize external knowledge, skills and expertise to solve problems and energize creative new ideas (Ajmal and Koskinen, 2008; Al-Salti, 2009). On the contrary, a rigid organisational culture that does not promote learning and collaboration is found to be a significant hurdle to effective KS (Gold et al., 2001; Al-Salti, 2009).

Organisational culture can also act as a mediator for national culture and KM processes (Ford and Chan, 2002; Rivera et al., 2009). According to Dalkir (2005), organisational culture and climate may either help or hinder KS. An organisational culture that encourages discovery and innovation will help, whereas one that nurtures individual genius will hinder. An organisation that rewards collective work will help create a climate of trust, whereas a culture that is based on social status will hinder KS. Without a receptive knowledge-sharing culture in place, effective knowledge exchanges cannot occur. Therefore, significant organisational changes may need to take place before effective KS can begin to take place. In summary, organisational culture can be portrayed as an ongoing, dynamic interaction among basic assumptions, values and norms, which manage knowledge effectively (Alavi et al. 2005; Manus, 2016).

- ***Rewards and Recognitions***

Rewards can be in terms of monetary incentives and non-monetary incentives (Bartol & Srivastava, 2002; Ismail & Yusof, 2012). To encourage and create a consistent knowledge sharing, monetary values such as financial rewards, salary increment and the like should be used (Davenport & Prusak, 1998; Ismail & Yusof, 2012).

- ***Work Process***

According to Davenport & Prusak (2000) cited in Ismail & Yusof (2012) KS should be included in work process. Therefore, many organizations around the world had and are trying to introduce effective KS in their work process (Chaudhry, 2005). As Andersson (2000), employees should be capable to contribute knowledge as part of their work process. Larsson & Ohlin (2002) in Ismail & Yusof (2012) believe that the implementation of knowledge management initiatives (such as knowledge sharing) should be, if possible, integrated into current work process.

- ***Office Layout***

According to Noor & Salim (2011), office layout becomes important issues of KS in organizations. Davenport and Prusak (2000) cited in Noor & Salim (2011) suggeste that corporate planner, architects, academics, and executives should give consideration and creative thought to the issues of office design which hinder corporate world citizens from working with knowledge. A good office design should create a work environment that encourages interaction among employees. A good example is the use of open workspace (Jones 2005; Noor & Salim, 2011).

2.4.2.3. Technological factors

According to Van den Brink (2003) definitions cited in Ismail & Yusof (2012), technology is software and hardware that people in organisations use in order to do their task, which means information and communication technology (ICT). The main role of ICT in knowledge sharing is 'to connect people with other people or with explicit knowledge' (Van den Brink, 2003; Ismail & Yusof, 2012). The term ''hybrid solutions'' refers to necessary interactions between people and technology to facilitate sharing practices (Davenport, 1996; Riege, 2005). ICT tools that exist in public organisations can help and facilitate employees to share knowledge (Syed et al., 2004; Ismail & Yusof, 2012; Andreasian & Andreasian, 2013).

Information and communication technology (ICT) use and knowledge sharing are closely linked, because ICT can enable rapid search, access and retrieval of information, and can support communication and collaboration among organizational employees (Huysman and Wulf, 2006; Lin, 2007). Therefore, Technology has the ability to offer instant access to large amounts of data and information and to enable long distance collaboration that facilitates a team approach, both in and between business functions and subsidiaries (Riege, 2005).

Although real knowledge sharing has little to do with hardware or technology (Wenger & Synder 2000; Ismail & Yusof, 2012), three variables are considered in the study which are ICT tools, ICT infrastructure and ICT know-how (Syed et al., 2004; Ismail & Yusof, 2012). As cited in Ismail & Yusof (2012, Anderson & Smith (1998) divided functionalities of ICT tools into five segments which are office applications (such as e-mail, messaging, calendaring and scheduling), groupware (such as discussion databases, application sharing and electronic meeting systems),

document systems (such as digital documents), work process systems (such as workflow management systems, process support systems and e-forms) analytical systems (such as decision support systems and data warehouse) and knowledge systems (such as portals, e-learning and knowledge sharing). ICT infrastructure is defined as an up to date physical ICT infrastructure that helps employee create, share knowledge in organisation (Syed Omar & Rowland, 2004; Ismail & Yusof, 2012). ICT know-how is defined as the computer literacy of worker in public sector in doing their daily works.

However, Knowledge sharing is as much a people and organisational issue as it is a technology challenge (Riege, 2005). There are several examples of technology factors, which could affect knowledge sharing. For instance, a lack of technology recourses, a lack of a technical support and an unrealistic expectation of employees (Andreasian & Andreasian, 2013). There is little doubt that technology can act as a facilitator to encourage and support knowledge sharing processes by making knowledge sharing easier and more effective. Technology that works effectively in some organisations may fail in others. At a technology level, barriers seem to correlate with factors such as the unwillingness to use applications due to a mismatch with need requirements, unrealistic expectations of IS/IT systems, and difficulties in building, integrating and modifying technology-based systems (Riege, 2005).

2.4.2.4. Nature of Knowledge

The study of knowledge in organisations has included studies on the NOK and on the process of KS (Ipe, 2003; Gagn, 2009). The ease of knowledge transfers and acquisition is influenced by the nature and the characteristics of the underlying knowledge (Narteh, 2008; Al-Salti, 2009). Implicit nature of that knowledge makes its transfer between people difficult, for it is not possible to express it in clear and understandable verbal and written form. Knowledge of the enterprises is unique, valuable, difficult to imitate and the result of a firm's history, structure and culture over time (Milovanović, 2011). The underlying NOK can be described with several dimensions (Al-Salti, 2009). The two most cited dimensions are ‘complexity’ and ‘tacitness’. Knowledge complexity refers to “the number of interdependent routines, individuals, technologies and resources linked to a particular knowledge” (Gosain, 2007; Al-Salti, 2009; Al-Salti et al., 2010).

Narteh (2008) cited in Al-Salti et al. (2010) contended that complex knowledge is likely to involve many interdependent components and may be difficult to be communicated between the source and the recipient. On the other hand, knowledge tacitness is "how easy or difficult it is to codify and articulate the information that needs to be transferred for specific knowledge" (Gosain, 2007; Al-Salti, 2009). Tacit knowledge, which individuals possess, is in implicit form (Milovanović, 2011). In fact, the biggest problem in knowledge transfer is the implicit nature of that knowledge. The knowledge is very difficult to articulate and tell in explicit form. Implicit nature of that knowledge makes its transfer between people difficult, for it is not possible to express it in clear and understandable verbal and written form. This knowledge is also called procedural knowledge, it is acquired through experience and experiments, and that is why it is completely clear and obvious to individuals who possess it (Milovanović, 2011).

2.5. Knowledge Sharing Theory and Model

2.5.1. Knowledge Sharing Model

Knowledge creation is a continuous, self-transcending process through which one transcends the boundary of the old self into a new self by acquiring a new context, a new view of the world, and new knowledge. One also transcends the boundary between self and other, as knowledge is created through the interactions amongst individuals or between individuals and their environment (Nonaka et al., 2000). The authors propose a model of knowledge creation consisting of three elements: (i) the SECI process, the process of knowledge creation through conversion between tacit and explicit knowledge; (ii) Ba, the shared context for knowledge creation; and (iii) knowledge assets-the inputs, outputs, and moderator of the knowledge-creating process. The three elements of knowledge creation have to interact with each other to form the knowledge spiral that creates knowledge.

Boisot (1987) in Haslinda & Sarinah (2009) developed a model that considers knowledge as either codified or uncodified and as diffused or undiffused, within an organisation. First, the term "codified" in this case refers to knowledge that can be readily prepared for transmission purposes such as financial data. In this model, codified undiffused knowledge is referred to as propriety knowledge and is deliberately transmitted to a small group of people, on a "need to know" basis. Second, "uncodified" refers to knowledge that cannot be easily prepared for transmission

purposes such as experiences. The model suggests that uncodified and undiffused knowledge is referred to as personal knowledge (e.g. experiences, perceptions, views, ideas). Third, the left quadrant of the model covers public knowledge and common sense knowledge. Public knowledge is codified and diffused (e.g. library, journals, books, newspapers, etc.). Finally, common sense knowledge, which is relatively diffused and uncodified, can gradually develop through the process of socialization and internationalization (Boisot, 1987; Haslinda & Sarinah, 2009).

Indeed, this model suggests that there is a spread or diffusion of knowledge across organisation as reflected in the horizontal dimension of the model. However, the codified and uncodified categories in the model are discrete categories of knowledge. In addition, the concept of diffused knowledge is rather general and lack clarity if it includes gathering knowledge within the organisation or the idea of spreading it.

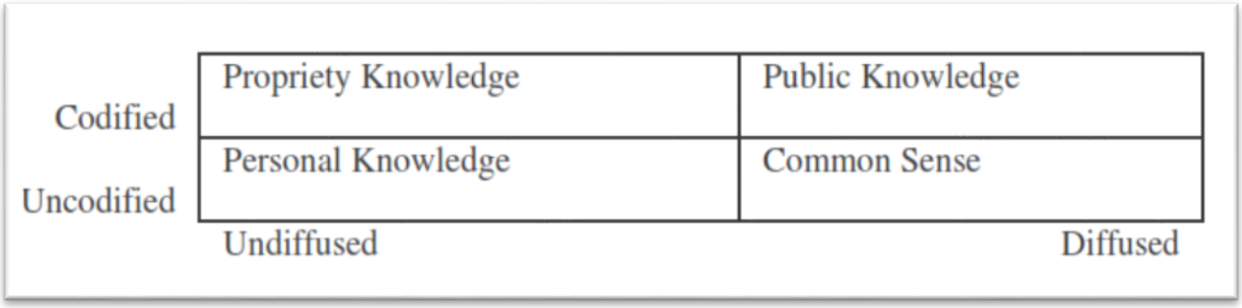

Figure 2.3: Boisot's Knowledge Category Model.
Source: (Nonaka & Takeuchi, 1995; Haslinda & Sarinah, 2009)

On the other hand, Nonaka's KM model as (Nonaka & Takeuchi, 1995; Haslinda & Sarinah, 2009) presumes that knowledge consists of tacit and explicit elements. In this aspect, tacit knowledge is defined as non-verbalized, intuitive and unarticulated, whilst, explicit knowledge is articulated and can be specified in writing, drawings, computer programming and others. Nonaka & Takeuchi (1995) model believes tacit knowledge can be transferred into tacit knowledge in others by socialization and tacit knowledge can be transferred into explicit knowledge by formalizing a body of knowledge or through externalization process. The model also believe that explicit knowledge can be transferred into tacit knowledge in others by translating theory into practice also known as a process of internalization and explicit knowledge can be transferred to

explicit knowledge in others by combining various existing theories – known as combination process. This simple matrix model presume that knowledge transfer in organisations is simple and straightforward but it was argued that it can be complicated and complex than it seems (McAdam & McCreedy, 1999; Nonaka & Takeuchi, 1995).

Even though each of these modes may independently create knowledge, the organisational knowledge creation processes only occur when all the four modes are organizationally managed and dynamically interacted. This process which is highly iterative constitutes 'knowledge spiral' which happens mainly through informal networks of relations in the organisation starting from the individual level, then moves up to the group (collective) level and eventually to the organisational level. It creates a 'spiraling effect' of knowledge accumulation and growth, which promotes organisation innovation and learning (Nonaka, 1994; Nonaka & Takeuchi, 1995).

According to Nonaka & Takeuchi (1995), there are several similarities between Nonaka's and Boisot's KM models. First, Boisot's codified and uncodified knowledge has some degree of similarity with Nonaka's category of tacit and explicit knowledge. Second, both models assume that there is a spread or diffusion of knowledge across the organisations as indicated by the horizontal dimension of the model. Finally, in correspondence with Boisot's model, Nonaka's tacit and explicit knowledge are two separate categories of knowledge.

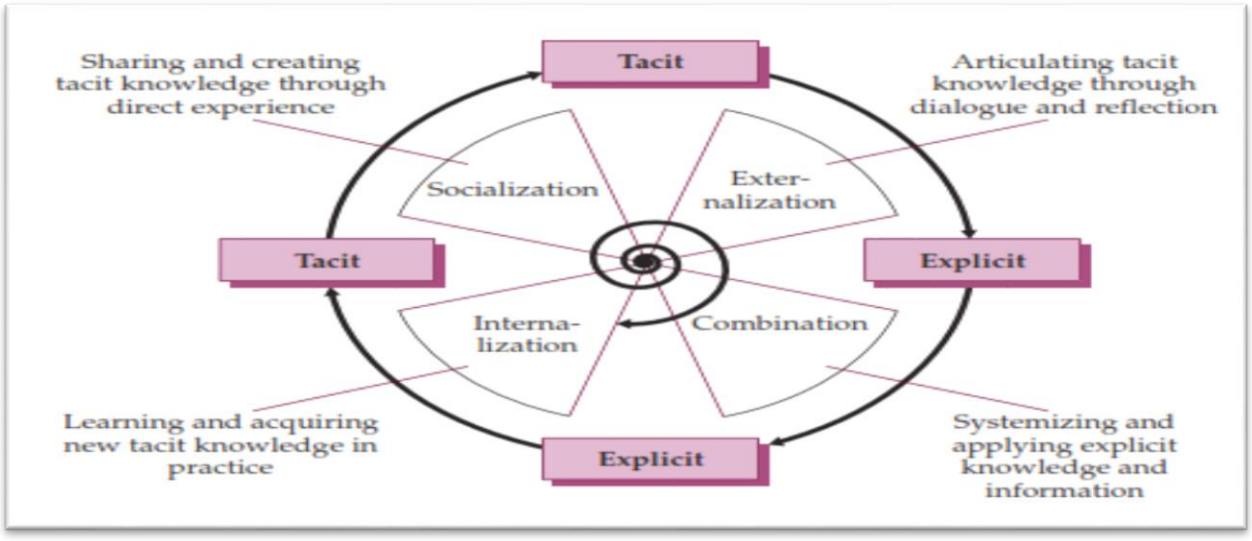

Figure 2.4 SECI Process of Knowledge Spiral.

Source: (Takeuchi, 2006)

Christensen (2007) cited in Andreasian (2013) determines knowledge sharing as a process of identifying existing knowledge in order to transfer and apply this knowledge to solve common problems in an organisation; or a process of creating new knowledge by combining existing knowledge. The communications between tacit and explicit knowledge are called knowledge conversion. During the conversion process, explicit and tacit knowledge expand in both quantity and quality (Nonaka, 1991; Nassuora, 2011). Although this model is originally developed for knowledge creation, it is also used to study knowledge sharing processes (Weir & Hutchings, 2005; Jonsson, 2007; Alony et al, 2007; Temtim. 2014). Nassuora (2011) describes the SECI knowledge creation model (Nonaka & Ikujiro, 1994) as follows:

Socialization (tacit to tacit)

Socialization consists of the shared formation and communication of tacit knowledge between people. Sharing knowledge is regularly done without ever producing explicit knowledge. This type of tacit KS begins between people who have a common culture and can work together proficiently. Therefore, the sharing of tacit knowledge is connected to ideas of collaboration and communities. A typical activity where tacit KS in can occur in non-academic staff and top management meeting during which experiences are described and discussed, with much communicated between the lines.

Externalization (tacit to explicit)

By its nature, tacit knowledge is not easy to convert into explicit knowledge. During conceptualization, elicitation, and finally articulation, usually in collaboration with others, some proportion of a person's tacit knowledge possibly captured in explicit form. Typical activities in which tacit knowledge is captured as the first step towards the conversion are in dialog among (academic staff, non-academic staff and top management) members, in responding to interview questions or through the elicitation of stories.

Combination: (explicit to explicit)

Explicit knowledge can be shared in meetings, through documents, e-mails, etc., or via education and training. Using technology to manage and search collections knowledge explicit is well recognized. On the other hand, there is an extra chance to foster creation of knowledge, specifically to improve the collected information in some way, for example by reconfiguring it, accordingly that it is more usable.

Internalization (explicit to tacit)

Therefore, as to act on information, individuals have to understand and internalize it, which includes creating their own tacit knowledge. Upon reading documents, they are able to some extent re-experience what others earlier learned. By reading documents from many sources, they can create new knowledge by combining their existing tacit knowledge with the knowledge of others. Nevertheless, this process is becoming more challenging because individuals have to manage ever-larger amounts of information. A typical activity would be to study and read documents from a number of different databases by an employee who needs to learn with regard the previous pass of the task he is now given.

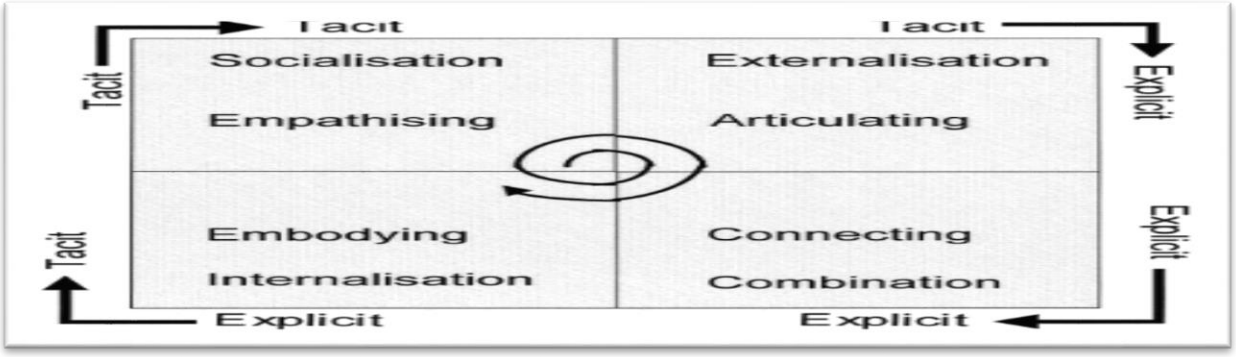

Figure 2.5: The SECI Process.

Source: (Nonaka et al., 2000)

It is important to note that the movement through the four modes of knowledge conversion forms a spiral, not a circle. In the spiral of knowledge creation, the interaction between tacit and explicit knowledge is amplified through the four modes of knowledge conversion. The spiral becomes larger in scale as it moves up through the ontological levels. Knowledge created through the SECI process can trigger a new spiral of knowledge creation, expanding horizontally and vertically across organisations. It is a dynamic process, starting at the individual level and expanding as it moves through communities of interaction that transcend sectional, departmental, divisional and even organisational boundaries. Organisational knowledge creation is a never-ending process that upgrades itself continuously (Nonakaet al., 2000).

On the other hand, contrary to the Cartesian view of knowledge, which emphasizes the absolute and context-free NOK, the knowledge-creating process is necessarily context-specific in terms of who participates and how they participate. Knowledge needs a physical context to be created: ``there is no creation without place''. Ba (which roughly means `place') offers such a context and it is not necessarily a place but also a time-space nexus (Nonaka et al., 2000). Nonaka et al. (2000) discuss each mode of Ba KS components as follows:

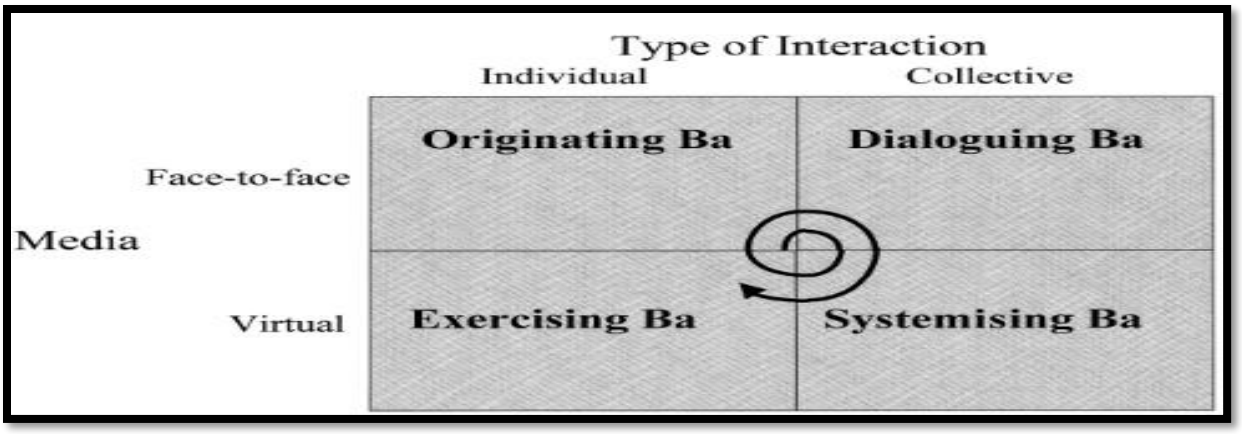

Figure 2.6: Four Types of Ba.
Source: (Nonaka et al., 2000)

Originating Ba

It is defined by individual and face-to-face interactions. It is a place where individuals share experiences, feelings, emotions and mental models. It mainly offers a context for socialization, since an individual face-to-face interaction is the only way to capture the full range of physical senses and psycho-emotional reactions, such as ease or discomfort, which are important elements in sharing tacit knowledge.

Dialoguing Ba

Dialoguing Ba is defined by collective and face-to-face interactions. It is the place where individuals' mental models and skills are shared, converted into common terms, and articulated as concepts. Hence, dialoguing Ba mainly offers a context for externalization. Dialoguing Ba is more consciously constructed than originating Ba. Selecting individuals with the right mix of specific knowledge and capabilities is the key to managing knowledge creation in dialoguing Ba.

Systemizing Ba

It is defined by collective and virtual interactions. Systemizing Ba mainly offers a context for the combination of existing explicit knowledge, as explicit knowledge can be relatively easily transmitted to a large number of people in written form.

Exercising Ba

Exercising Ba is defined by individual and virtual interactions. It mainly offers a context for internalization. Here, individuals embody explicit knowledge that is communicated through virtual media, such as written manuals or simulation programs. Exercising Ba synthesizes the transcendence and reflection through action, while dialoguing Ba achieves this through thought. Ba has a complex and ever-changing nature.

The key concept in understanding Ba is `interaction'. Ba sets a boundary for interactions amongst individuals, and yet its boundary is open. As there are endless possibilities to one's own contexts, a certain boundary is required for a meaningful shared context to emerge. Yet Ba is still an open place where participants with their own contexts can come and go, and the shared context (Ba) can continuously evolve.

2.5.2. Knowledge Sharing Theory

A theory is a system of ideas that abstracts and organizes knowledge about the social world and that provides underpinning knowledge to explain the behavior of a phenomenon under investigation (Sinclair, 2007; Temtim, 2014). It gives a list of constructs and relationships for data collection and empirical testing (Temtim, 2014). As cited in Ingari & Ali (2017), two of the most common theories of KS are social exchange theory (Kern and Willcocks 2002; Lee and Kim 1999; Mao et al. 2008) and relational exchange theory (Kern and Blois 2002; Olsson et al. 2008). Many of the social exchange theory propositions are well suited for analyzing the inter-organisational exchange relationship (Son et al., 2005; Ingari & Ali, 2017). Relational exchange theory is also considered appropriate to examine client-vendor relationships as it looks at the factors that influence the quality of the relationship factors between the parties in an exchange relationship (Swar et al. 2012; Ingari & Ali, 2017). Relational theories are used to identify factors that influence people’s attitude and norms in social interaction (Nahapiet & Ghoshal, 1998; Temtim, 2014).

Social exchange theory is a broad conceptual paradigm that spans a number of social scientific disciplines, such as management, social psychology, and anthropology. Despite its name, it is not a single theory but is better understood as a family of conceptual models (Cropanzano& Mitchell, 2005; Ingari & Ali, 2017). All social exchange theories treat social life as involving a series of sequential transactions between two or more parties (Mitchell, Cropanzano, & Quisenberry, 2012; Ingari & Ali, 2017). Resources are exchanged through a process of reciprocity, whereby one party tends to repay the good (or sometimes bad) deeds of another party (Gergen, 1969; Gouldner, 1960; Ingari & Ali, 2017). The underlying assumption of social exchange theory is that parties enter into and maintain relationships with each other, expecting that such behavior will be rewarding (Lambe et al., 2001; Ingari & Ali, 2017).

Social exchange theory emphasizes the concept of a longitudinal exchange relation between parties, focusing on the social process of give-and-take in relations, with the aim to understand the behavior of each party contributing to the exchange (Kern 1997; Ingari & Ali, 2017). There are three types of reciprocity in social exchanges that are also applicable to knowledge sharing: (a) reciprocity as a transactional pattern of interdependent exchanges, (b) reciprocity as a folk belief, and (c) reciprocity as a moral norm (Cropanzano & Mitchell, 2005; Ingari & Ali, 2017). Reciprocity as transactional pattern of interdependent exchanges is represented by exchange of resources that provides objective value for interacting actors (Cropanzano & Mitchell, 2005; Temtim, 2014). It can also be "an ability, possession, or other attribute of an actor giving him the capacity to reward (or punish) another specified actor" (Emerson, 1976; Temtim, 2014). Further, social exchange theory assumes the cooperative intention of both parties and such cooperation is a key attribute of social exchange theory (Das and Teng 2002; Lin et al., 2004; Ingari & Ali, 2017).

2.6. The Literature Gaps

According to Macomber (2013) in Perjanik (2016), the number of people living in cities is expected to nearly double in the next 40 years to six billion and "many cities lack sufficient clean water, electricity, reliable public transit, and other basic resources needed to support their exploding populations and strengthen their economies". This expected increase in demand combined with the challenges facing utilities pose significant challenges to electrical utility organisations.

This is especially challenging considering the current state of the aging equipment, the impending retirement of a significant portion of the workforce, and the managing of the knowledge required to sustain the reliable delivery of energy.

Public organisations seem to give attention on the importance of KM in drafting policies and enhance service delivery (Thomas, 2005; Syed et al., 2004; Ismail & Yusof, 2012). However, there is little study on both KM and KS in such a sector (McAdam & Reid, 2000; Ismail & Yusof, 2012). This could be due to the status of public sector as non-profit organisations (Syed et al., 2004; Ismail & Yusof, 2012). For non-profit organisations, KS has its own limitation. Since, it is seen relevant to areas such as to continuously increase performance, other than to increase customer and employee satisfaction (Pan & Scarbrough, 1999; Ismail & Yusof, 2012.

As cited in Perjanik (2016), Dzekashu and McCollum (2014) noted that "knowledge loss resulting from an aging workforce continues to be a management nightmare" and that operational continuity poses a threat to organisations not equipped to address the situation. Furthermore, according to Perjanik (2016), there is a lack of research on the average age of the electrical engineers responsible or the potential issues associated with replacing them or maintaining their knowledge upon retirement. Therefore, whether EEU is replacing its aged electrical engineers and other employees or retaining their knowledge yet to be known.

2.7. Chapter Summary

In this chapter, the concept of knowledge, KM, KM Life cycle, KMS and KS Models and Theories have been reviewed. Proper coverage has been given to NOK, Individual, Organizational and Technological KS factors. Regarding to knowledge, different views were presented. Knowledge is commonly categorized in to two: tacit and explicit knowledge. Knowledge is considered as intellectual capital and as a result KM becomes a new management requirement to address the newly emerging intellectual capital. KS is a two-way interaction that requires active involvement of the knowledge owners and knowledge seekers. KS activity can be performed through face-to-face and using documents and ICT. KS is a complex phenomenon, which is affected by behavioral, relational, motivational and technological factors. The KS factors can be summarized as individuals, organizational and technological factors. Most recently, the nature of the knowledge itself is pointed out in few literatures as KS factor.

CHAPTER 3: RESEARCH METHODOLOGY

3.1. Introduction

Research methodology is the philosophy or the general principle that helps the researchers to guide a study, which includes constraints, dilemmas and ethical choices, and represents a theory and analysis of how research does or should proceed (Dawson, 2002). As cited in Temtim (2014), research methodology is the general framework of the research processes to undertake the research (Benbasat, Goldstein, & Mead, 1987; Yin, 2003). Generally, it is an overall blue print of the research process which includes the research paradigm, research procedure, data collection instruments, data analysis methods and data interpretation (March & Smith, 1995, Hevner et al., 2004; Temtim, 2014).

Research can be classified in different ways. Despite the fact, based on specific objectives that the research intends to address, it is categorized as descriptive, explanatory and exploratory researches. Descriptive research sets out describe and to interpret what is and further classified as surveys, correlation studies, observation studies and case studies. It aims to describe the state of affairs, as it exists. On the other hand, explanatory research aims at establishing the cause and effect relationship between variables. The researcher uses the facts or information already available to analyze and make a critical evaluation of data/information. Again, exploratory research is less formal, sometimes even unstructured focuses on gaining background information and helps to better understanding and clarify a problem. It can be applied in developing hypotheses and question to be answered (Abiy et al., 2009).

Moreover, based on the research approach a research can be classified as qualitative and quantitative researches (Abiy et al., 2009). Qualitative research explores attitude, behavior and experiences through interviews or focus groups. It attempts to get an in-depth opinion from participants and few people take part in the research. Whereas quantitative (causal explanation) research generates statistics by large-scale survey research, using methods such as questionnaires or structured interviews (Dawson, 2002). The other important part of a research is research data collection methods. These are the tools in which a researcher uses to gather data, such as questionnaires or interviews (Dawson, 2002).

3.2. Research Design

The purpose of this research is to identify factors affecting KS in EEU while practicing intra-organizational KS as institution. Since objective truth is the concern of the researcher, it is definitely intended for problem solving research. This implies that the research poles to a design science research paradigm in general and a quantitative correlational research method type in particular. According to Abiy (2009), correlational method traces relationship (negative or positive) among two or more variables in order to gain greater situational insights or any association existed but not cause-effect relationship among variables. From the perspective of research approaches, majorly this study margins to quantitative study.

However, exploring views, attitudes, behavior, knowledge and experiences of the study's population qualitatively through one-to-one and face-to-face interview accompanied. This helps to supplement, enrich and triangulate the questionnaires' results and come up with comprehensive KS Framework. Generally, the plan and the structure of the research design that the researcher undertaken to collect and analyze the data have been specified in the following sub-sections in detail.

3.2.1. Units of Analysis

The unit of analysis is the level at which the research is studied and which objects are researched (Blumberg, Cooper, & Schindler, 2011; Mesfin, 2017). Therefore, a decision has to be taken concerning a sampling unit before selecting sample (Kothari, 2004). As noted in Chapter One under specific objectives sub-section, the objective of this research is to study factors affecting Intra-organizational KS in EEU. Therefore, the units of analysis were the EEU head office, East Addis Ababa Region, West Addis Ababa Region, North Addis Ababa Region and South Addis Ababa Region as a whole and the smallest unit of analysis was the individual staff participated in the study.

3.2.2. Study Population

The study population includes the staffs from EEU head office and four Regions in Addis Ababa: East Addis Ababa Region, West Addis Ababa Region, North Addis Ababa Region and South Addis Ababa Region. The total permanent staffs of EEU as of March, 2018 was more than 12,100 and contract workers were more than 4,200.

In order to have a rich and comprehensive information input from the research, permanent staffs who have at least two years' experience in EEU and first degree holders were preferred. They were preferred since they have a better exposure and understanding than others about the organizational culture and structure, staff interactions and KS practice in EEU. Among the total permanent population, 1,837 staffs were working in EEU head office and the four Regions in Addis Ababa. Of these, staffs that full fill the selection criterion stated above were 584 which is the sample frame.

3.2.3. Sampling Methods/Techniques

Based on the sample frame noted in the previous sub-section, each of the study units has a total sample frame: Head Office=355, East Addis Ababa Region=59, West Addis Ababa Region=57, North Addis Ababa Region=57 and South Addis Ababa Region=56 permanent staffs. This in turn shows that the population is heterogeneous in location, hierarchy and population size. In this case, a proportional stratified random sampling is useful method for data collection (Singh & Masuku, 2014). Therefore, a proportional stratified sampling technique was considered to get representative sample size from each units of the study or stratums.

In determining the sample size, Krejcie & Morgan (1970) formula ($s = X^2 NP(1-P) \div d^2(N-1) + X^2 P(1-P)$ has been used. s = required sample size, X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841), N = the population size, P = the population proportion (assumed to be .50 since this would provide the maximum sample size), d = the degree of accuracy expressed as a proportion (.05). Finally, a systematic random sampling method used to determine the list of participants from each of the study units or stratums by picking up the starting point randomly among the interval, then select every k^{th} item on the list where k=N/n, "N" is sample frame size and "n" is the sample size determined.

According to Marshall (996), qualitative researchers recognize that some informants are 'richer' than others are and that these people are more likely to provide insight and understanding for the researcher. Therefore, the researcher can select the most productive sample to answer the research question who can involve in developing a framework of the variables that might influence as an individual contribution and based on the researcher's practical knowledge of the research area.

Among the hierarchy of the EEU, senior management, middle management and junior management staffs were selected through purposive approach due to their high-level personnel regarding to designing strategies, planning, managing and decision making role they hold up in operating EEU's core business activities. Again, according to Hsiu-Fen and GwoGuang (2004) cited in Najibullah et al. (2013), the tendency for a knowledge sharing culture to exist within a company is largely dependent on the attitudes of its senior managers. This confirms that the approach can supplement the development of KS Framework to fit the context of EEU. Therefore, in this research a purposive sampling method was determined based on the above reasons and (Gay & Airasian, 2000) approach cited in Supar (2012).

3.2.4 Sample Size

Estimating sample size before conducting a study, or at the early stage of a study, is scientifically important to maximize the probability to detect any existing significant correlations (Beaulieu-Prévost, 2006, Corty, 2007, Field, 2009, Kelley, 2008; Moinester & Gottfried, 2014). Sample size problems are context-dependent. For example, how important it is to increase the sample size to account for such uncertainty depends on practical and ethical criteria (Lenth, 2001). Sample size is obviously depending on the type of research as well. The sample size will also depend on what the researcher wants to do with his/her results. If the researcher intends to produce large amounts of cross tabulations, the more people he/his contact the better. Sample size tends to be a general rule in quantitative research that the larger the sample the more accurate the results (Olsen & George, 2004). The large sample population favored the decision to use a quantitative survey instrument (Ladd, 2002).

However, people be probably restricted by time and money. Therefore, sample size is not always the main issue; it is only one aspect of the quality of a study design (Lenth, 2001). The ever-increasing demand for research has created a need for an efficient method of determining the sample size needed to be representative of a given population. In the article "Small Sample Techniques", the research division of the National Education Association has published a formula for determining sample size (Krejcie & Morgan, 1970). Subsequently, the following common terminologies in sampling process have been considered and decided their respective values to determine the sample size of this study:

- **Margin of Error (Confidence Interval)**: No sample will be perfect, so the researcher must decide how much error to allow. The confidence intervals determine how much higher or lower than the population mean in which the researcher is willing to let his/her sample mean fall. In this study, a margin of +/-5% is considered.

- **Confidence Level:** Confidence level tell us how confident a researcher wants to be that the actual mean falls within his/her confidence interval. The most common confidence intervals are 90% confident, 95% confident and 99% confident. The EEU has a wide range of staffs and activities other than the electrical engineering. Again, the study focuses on head office and four Regions in Addis Ababa staffs only. Therefore, 95% is taken as a confidence level value.

- **Standard of Deviation:** It determines how much variance is expected from one's research responses. The safe decision is to use 0.5, which is the most forgiving number and ensures that a sample was large enough.

Based on the statistical parameters set above, the following formula was used to get a representative sample size required from a given population in order to meet the intention of the study (Krejcie & Morgan, 1970).

$$s = X^2 NP (1 - P) \div d^2 (N - 1) + X^2 P (1 - P)$$

s = required sample size.

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population size which is 584

P = the population proportion (assumed to be .50 since this would provide the maximum sample size).

d = the degree of accuracy expressed as a proportion (.05). Then, the sample size is calculated as follows:

S= ((3.841*584*0.5) * (1-0.5)) / ((0.05)2 * (584-1)) + ((3.841*0.5) * (1-0.5)).

S= 560.786/2.418

S= 232

Therefore, using the formula the required Sample Size S=232 for the questionnaires handled in this research.

Table 3.1: Summary of Population, Sample Size and Proportion of each study Units

Study Unites	Total population	Total study population size per units based on the criterion set	Sample size proportion for each units	Actual sample size per study units
Head Office	1039	355	0.607876712	141
East Addis Ababa Region	167	59	0.101027397	23
West Addis Ababa Region	248	57	0.09760274	23
North Addis Ababa Region	185	57	0.09760274	23
South Addis Ababa Region	198	56	0.095890411	22
Sum	**1837**	584	1	232

Quantitative researchers often fail to understand the usefulness of studying small samples. First, samples for qualitative investigations tend to be small. An appropriate sample size for a qualitative study is one that adequately answers the research question (Marshall, 1996). In this research, the purpose of interview is to supplement the quantitative study particularly to get useful inputs that can contribute to develope KS Framework design. The purposive sampling technique is recommended for qualitative research (Neuman, 2003; Mesfin, 2017), in order to identify key participants that enable the researchers to have a detailed understanding of the phenomena understudy. Sarantakos (2005) cited in Mesfin (2017) suggests, in purposive sampling “the researcher purposely can choose subjects who, in their opinion, are relevant to the project”.

In the three managerial hierarchies that means senior, middle and junior management staffs, there is also further division under each hierarchy. Therefore, from each hierarchy three individuals were picked up who are at the top of tiers or layers. Generally, a total of nine (9) EEU strategic level staffs were considered for the interview selected purposively for their rich experience, expected contribution and decision-making power they hold up.

3.2.5. Data Collection Methods

The application of different data collection methods can improve the robustness of the research results through the cross-validation of data gathered using different methods (Remus & Wiener, 2009; Mesfin, 2017). Myers (2009) cited in Mesfin (2017) also highlights that triangulation of data from different sources increases the quality of data, and accordingly the accuracy of the findings. Therefore, in this study, multiple methods of data collection specifically a predominantly quantitative methodology was used comprised of self-administered closed-ended questionnaire with very few open-ended ones, one-to-one and face-to-face semi-structured interview, observation, and document review also conducted to get an overall picture of the institution. However, the main sources of data were closed-ended self-administered questionnaires and one-to-one and face-to-face or phone call semi-structured interview.

3.2.6. Developing Instrument

A closed-ended with very few open-ended questions containing five demographic and fifty-eight Likert Scale type questions adopted from other related articles using English language (Agarwal & Marouf, 2016; Perjanik, 2016) with modification in line with the objectives of this study. The questions include Likert scale one with a value of strongly agree=5, agree=4, neutral=3, disagree=2 and strongly disagree=1 for all questions. In the same manner, a semi-structured interview guideline was adopted from other related articles using English language with some rewordings (Ismail & Yusof, 2012; Temitim, 2014; Perjanik, 2016) annexed next to the reference section and summarized in Table 3.2 below.

Table 3.2. Adopted Quantitative Instruments Reference Summary

Constructs	**Code**	**Questions**	**References**
		Part II-Items	
KS Incentive Mechanisms	4.1	Monetary incentives (salary increment, extra time payment etc.)	(Rahel & Ermias, 2011; Adem, 2010)
	4.2	Career development	(Adem, 2010; Razmerita et al., 2016)

Constructs	Code	Questions Part II-Items	References
	4.3	Promotion	(Adem, 2010; Razmerita et al., 2016)
	4.4	Gaining expert status	(Adem, 2010)
	4.5	Acknowledgement of your contribution	(Adem, 2010)
	4.6	Less complex and less centralized organizational structure	(Ismail & Yusof, 2010)
	4.7	ICT tools that are simple and easy to use	(Ismail & Yusof, 2010)
	4.8	Getting further Education or advanced training opportunity	(Adem, 2010)
Constructs	**Code**	**Questions** **Part III-Items**	**References**
Awareness	1	I am aware of the importance of knowledge sharing in daily work	(Sandhu, Jain, & Ahmad, 2011)
	2	Knowledge sharing helps not to repeat the same mistake	(Vuori & Okkonen, 2012)
	3	I believe I would gain new ideas, technologies, skills or techniques by sharing knowledge	(Vuori & Okkonen, 2012;)
	4	I believe knowledge sharing helps to learn faster	(Vuori & Okkonen, 2012)
	5	My colleagues know that sharing knowledge increases the productivity of their organization and customer satisfaction	(Vuori & Okkonen, 2012)
Trust	1	I trust knowledge of my co-workers due to accuracy and credibility	(Riege, 2005; Noor & Salim, 2011)
	2	My colleagues feel very confident on my skill and knowledge or capability	(Wanjau & Kenneth, 2014))
	3	Employees share knowledge without the fear that his/her knowledge is being misused by taking unjust credit or bad intention	(Riege, 2005; (Razmerita et al., 2016)

Constructs	Code	Questions Part II-Items	References
Personality	1	I am an extrovert type of person (like to know what is happening, socialize and open minded)	(Noor & Salim, 2011)
	2	I enjoy helping colleagues by sharing my knowledge	(Sandhu, Jain, & Ahmad, 2011)
	3	I am confident in my ability to provide knowledge that others in my organization consider valuable one	(Sandhu, Jain, & Ahmad, 2011)
	4	Employees in my organization share knowledge because they do not think knowledge is power	(Sandhu, Jain, & Ahmad, 2011)
	5	I would rather cooperate with colleague than compete with them	(Sandhu, Jain, & Ahmad, 2011)
Job Satisfaction	1	In my organization employees are happy with their daily work	(Adem, 2010)
	2	I often share knowledge with my colleagues in EEU	(Bethelehem, 2017)
Rewards and Recognitions	1	In my organization individuals who share their knowledge gets rewards and recognition	(Ismail & Yusof, 2010; Bethelehem, 2017)
	2	In my organization I get bonus, promotion in return to my knowledge sharing with colleague	((Ismail & Yusof, 2010; Bethelehem, 2017)
Organizational Structure	1	The organizational structure in EEU is flexible and adoptable for changing-environment to share knowledge easily	((Ismail & Yusof, 2010; Bethelehem, 2017)
	2	The EEU organizational structure emphasize on parallel relations (not hierarchical) rather than vertical ones formality so that conducive to share knowledge	((Ismail & Yusof, 2010; Noor & Salim, 2011))
	3	The EEU organizational structure is not static one which is recognized by characters such as less complexity and centralization that facilitates knowledge Sharing	((Ismail & Yusof, 2010; Noor & Salim, 2011))

Constructs	Code	Questions Part II-Items	References
Organizational Culture	1	My organization encourages new idea and focus on learning from failure	(Perjanik, 2016; Razmerita et al., 2016; Noor & Salim, 2011))
	2	My organization consults team members to make decision and solve problem	(Perjanik, 2016; Wanjau & Kenneth, 2014)
	3	My organization encourages group interaction (team work) regarding knowledge sharing	(Perjanik, 2016; Razmerita et al., 2016)
	4	In the EEU, there is periodic meetings in which people working in different teams, department may participate	(Ismail & Yusof, 2010; Wanjau & Kenneth, 2014)
	5	There is informal (spontaneous hallway meetings or over a cup of coffee) knowledge sharing practice within EEU	(Ismail & Yusof, 2010; (Wanjau & Kenneth, 2014)
Office Layout	1	The physical design of my office layout is open which can facilitate knowledge sharing in the EEU easily.	(Ismail & Yusof, 2010; Wanjau & Kenneth, 2014)
	2	Physical work environment and layout of work areas do not restrict effective knowledge sharing in my organization, EEU	(Ismail & Yusof, 2010; Noor & Salim, 2011)
Work Process	1	Knowledge Sharing is integrated or included into daily work process (processes and procedures involved when doing a particular job) of my organization, EEU	(Ismail & Yusof, 2010; Noor & Salim, 2011)
	2	There is a system put in place to identify the colleagues with whom I need to share my knowledge	(Ismail & Yusof, 2010; Noor & Salim, 2011)
ICT Infrastructure	1	Up to date physical Information Communication Technology and infrastructure (internet, intranet) are available in the EEU	(Rahel & Ermias, 2011; Ismail & Yusof, 2010)
	2	ICT systems and processes are put in place in my organization to share knowledge.	(Ismail & Yusof, 2010; Noor & Salim, 2011)

Constructs	Code	Questions	References
		Part II-Items	
ICT Know-How	1	EEU employees have sufficient know-how or literacy on using ICT systems implemented for knowledge sharing	(Ismail & Yusof, 2010; Noor & Salim, 2011)
	2	In the EEU, employees use knowledge networks such as (email, intranet, internet and other ICT systems) to communicate and share knowledge with colleagues	(Ismail & Yusof, 2010; Noor & Salim, 2011)
	3	Employees make extensive use of electronic storage (such as databases) to access knowledge	(Adem, 2010; (Sandhu, Jain, & Ahmad, 2011)
ICT Tools Type	1	Information Communication Technology tools implemented in EEU are suitable to share knowledge	(Ismail & Yusof, 2010)
	2	My organization has user-friendly information technology systems which support employees to sharing knowledge easily	(Ismail & Yusof, 2010)
	3	Information Communication Technology tools implemented in EEU is useful to share knowledge	(Ismail & Yusof, 2010)
Nature of Knowledge	1	The knowledge in EEU is complicated to understand and transfer to others since a number of interdependent routines, individuals, technologies and resources are linked each other-complex in nature	(Al-Salti Z. 2009; Al-Salti et al., 2010)
	2	The knowledge in EEU resides in individual mind is sticky to convert or articulate verbally or written form in to documents or other forms of explicit knowledge	(Al-Salti Z. 2009; Al-Salti et al., 2010)
Knowledge Sharing	1	In my organization knowledge sharing is a component of performance evaluation	(Perjanik, 2016)
	2	In my organization knowledge sharing is highly valued	(Perjanik, 2016)
	3	My organization, EEU, retains highly skilled experienced staffs' tacit knowledge before they leave the organization	(Perjanik, 2016)
	4	My organization has comprehensive motivational scheme to motivate knowledge sharing practice among employees	(Rahel & Ermias, 2011; Perjanik, 2016)
	5	My organization has knowledge repository that employees use to accomplish their daily office activities	(Ismail & Yusof, 2010)

Constructs	Code	Questions	References
		Part II-Items	
	6	Employees in EEU often share knowledge with their colleagues	(Agarwal & Marouf, 2016)
	7	Employees in EEU are motivated to share knowledge to their colleagues	(Agarwal & Marouf, 2016)

Finally, the researcher's observation checklist was adopted from (Hareya, 2011) and the checklist questions to evaluate KS Framework from (Bethelehem, 2017).

3.2.7. Data Collection Procedures

First, related literatures have been reviewed to get insight about the study area from previous works. Second, data collecting instruments have been adopted based on the related literature reviewed and the basic questions set to be answered in this study. Then, a pre-test has been conducted in West Addis Ababa Region to check the validity of the questionnaires or refine the instrument. The participant for this purpose was taken from the sample size of West Addis Ababa Regions that was already determined using the systematic random sampling technique by picking up the first 15 individuals purposively for its simplicity and considering the individuals' eligibility for the study.

Following the pretest, the necessary amendments have been made up on the feedback or shortcomings obtained before distributing them to the ultimate respondents. Finally, the questionnaires were redistributed to the participants in person by the researcher and recollected within a couple of week time in the same fashion then, checked and cleaned. Regarding to qualitative study, it has been conducted to collect additional data simultaneously with the quantitative method using Amharic language from nine individuals through one-to-one and face-to-face interview. Moreover, observation and document review activities were done using the check list prepared for these purpose successively.

3.2.8. Research Model and Hypotheses

This study adopted KS factors models from Ismail & Yusof (2012) and Al-Salti (2009). Individual, Organizational and Technolgical factors are adopted from the first authors where as NOK factor from the second one. In general, four major KS dimensions are considerd to identify the influencing or impacting factors on KS in EEU both negatively and positively. Subsequently, four components are included for Individual dimention in the study: awareness, trust, personality and job satisfaction. In organizational dimension, five variables are submitted: organizational structure, organizational culture, rewards and recognitions, work process and office layout. In Technological dimension, ICT infrastructure, ICT Know-how and ICT tools type are included (Razmerita et al., 2016). Finally, the NOK dimension spans on complexity and tacitness of the knowledge itself considered.

On the other hand, under the dependent variable, KS practice, the frequency and level of motivation to share knowledge among EEU employees are included. Moreover, from the EEU perspective, the presence of motivational scheme, level of KS valued, integration of KS in performance evaluation and knowledge retention are submitted (Perjanik, 2016; Bethelehem, 2017).

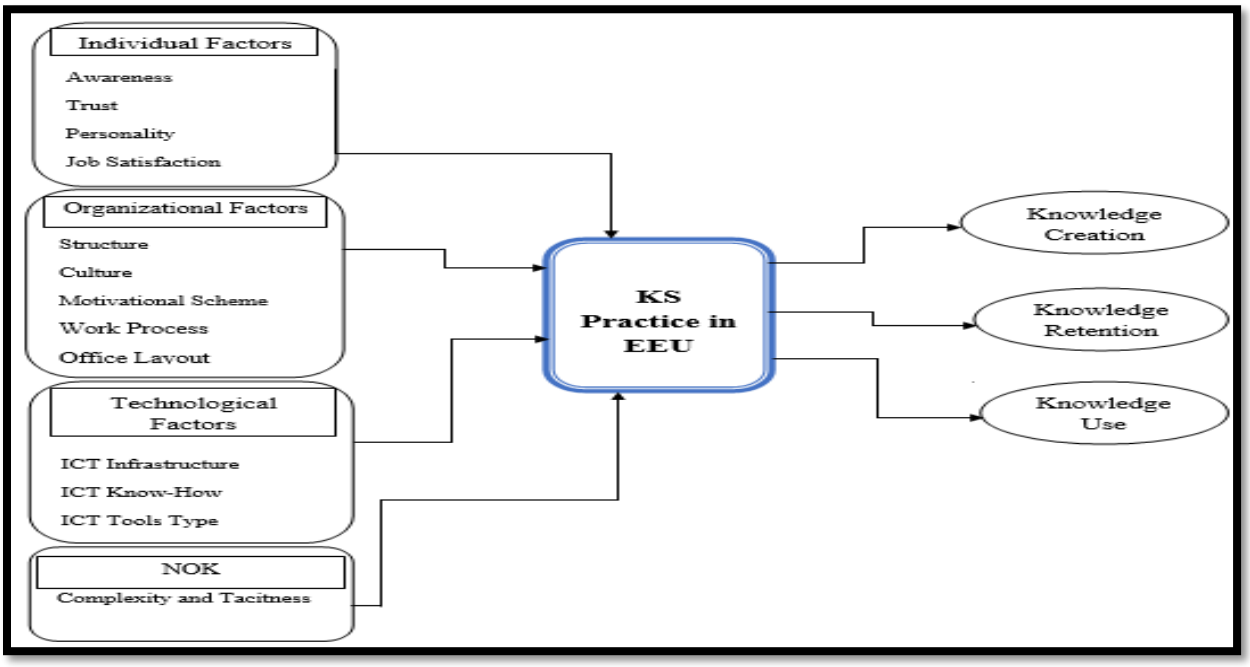

Figure 3.1: Knowledge sharing model

Source: Adapted from Al-Salti (2009) and Ismail & Yusof (2012)

In examining the relationship between KS and factors affecting it, twelve alternative hypotheses are adopted from Ismail & Yusof (2012) and one alternative hypothesis from Al-Salti (2009) which is a total of thirteen hypotheses defined below.

- **Hypothesis for Nature of Knowledge Factors**

H1: The more complex and tacit the knowledge, the less the knowledge shared and acquired by the client.

- **Hypotheses for Individual Factors**

H2: Awareness of the importance of knowledge sharing is positively related to knowledge sharing practice.

H3: Trust is positively related to knowledge sharing practice.

H4: Personality is positively related to knowledge sharing practice.

H5: Job satisfaction is positively related to knowledge sharing practice

- **Hypotheses for Organizational Factors**

H6: Organizational structure is positively related to knowledge sharing practice.

H7: Organizational culture is positively related to knowledge sharing practice.

H8: Rewards and recognitions are positively related to knowledge sharing practice.

H9: Office Layout is positively related to knowledge sharing practice

H10: Work Process is positively related to knowledge sharing practice

- **Hypotheses for Technological Factors**

H11: ICT infrastructure is positively related to knowledge sharing practice.

H12: ICT tools Type is positively related to knowledge sharing practice

H13: ICT know-How is positively related to knowledge sharing practice

3.2.9. Data Analysis and Presentation

The methods to analyze data will depend on whether the chosen research method be either qualitative or quantitative one. It will also be influenced by personal and methodological preference and educational background of the researcher (Liao et al., 2007). The analysis of the data was processed based on the returned questionnaires' and interview's responses. The data collected using questionnaires have been analyzed quantitatively using IBM SPSS Statistics ver.20 while the data collected through interview analyzed manually by grouping in to seven thematic areas respective to quantitative variables of this study, and summarized in text. A common measure of association between two variables x and y is the Bivariate Pearson correlation coefficient ρ (x, y) that characterizes the strength and direction of any linear relationship between x and y (Moinester & Gottfried, 2014).

Therefore, a One-Tailed Pearson Correlation Coefficient was used and the result presented using APA format while the variables are approximately normally distributed. Otherwise, a One-Tailed Spearman's correlation coefficient rho (ρ), which is non–parametric in nature, and is more robust to outliers than is the Pearson's correlation coefficient "r" (Gogtay & Thatte, 2017) optioned or applied. In the case of Multivariate analysis, one factor MANOVA was preferred and used. Linear Regression also performed to enrich the analysis results and increase the acceptance of the findings. The defined hypotheses are positive type relationship for individual, technological and organization dimensions whereas, a negative association for NOK with the KS practice dimension. Subsequently, Bivariate and Multivariate analysis performed to assess and examine the presence and degree of association between dependent (KS) and independent variables (individual, technological, organization factors and NOK dimensions).

Moreover, the study population demographic variables presented in frequencies and percentage using univariate analysis or simply in statistical description. Then, the analyzed data presented in tables and other proper way of display methods. Finally, summary of the findings, conclusions and recommendations presented in each sub section of the subsequent chapters in proper.

3.3 Measure of Knowledge Sharing

The following measure of KS presented based on the questionnaire prepared for quantitative study that is annexed in this study.

Table 3.3. Measure of Knowledge Sharing

KS Factors	Measure of KS
Knowledge Sharing Incentives	Eight closed-ended questions with Likert scale response option ranging from strongly agree to strongly disagree
Knowledge Sharing Constructs	Six closed-ended questions with Likert scale response option ranging from strongly agree to strongly disagree
Awareness	Five closed-ended questions with Likert scale response option ranging from strongly agree to strongly disagree
Trust	Three closed-ended questions with Likert scale response option ranging from strongly agree to strongly disagree.
Personality	Five closed-ended questions with Likert scale response option ranging from strongly agree to strongly disagree
Job Satisfaction	Two closed-ended questions with Likert scale response option ranging from strongly agree to strongly disagree
Reward and Recognition	Two closed-ended questions with Likert scale response option ranging from strongly agree to strongly disagree
Organizational Structure	Three closed-ended questions with Likert scale response option ranging from strongly agree to strongly disagree
Organizational Culture	Five closed-ended questions with Likert scale response option ranging from strongly agree to strongly disagree
Office Layout	Two closed-ended questions with Likert scale response option ranging from strongly agree to strongly disagree
Work Process	Two closed-ended questions with Likert scale response option ranging from strongly agree to strongly disagree
ICT infrastructure	Two closed-ended questions with Likert scale response option ranging from strongly agree to strongly disagree
ICT Know-how	Three closed-ended question with Likert scale response option ranging from strongly agrees to strongly disagree
ICT Tools Type	Two closed-ended question with Likert scale response option ranging from strongly agrees to strongly disagree
Nature of Knowledge	Two closed-ended question with Likert scale response option ranging from strongly agree to strongly disagree

3.4. Ethical Considerations

Formal letter received from Addis Ababa University school of Information science has been submitted to EEU CEO Office and got a green light to proceed on the study. Subsequently, the responsible bodies of EEU head office related to the study have been informed and contacted timely. During data collection, each respondent was informed about the purpose, scope and expected outcome of the project and offered a proper written consent on the study's footpath. The data planned to be collected was kept confidential, analyzed and presented anonymously. Above all, the researcher made his work free of any kind of plagiarism.

3.5. Chapter Summary

This chapter discussed mainly the research methodology paradigms and the different research methods including by narrating the rationale be vested in behind this work. The Chapter also described in detail the research type, study population, inclusion and exclusion criterion, sampling techniques, samples size and data collection instruments. The research models and hypotheses, data analysis techniques and the research's findings presentations approaches also covered. It also clearly defined KS as the study dependent variable and NOK factors (complexity and tacitness), organizational factors (structure, culture, reward & recognition, work process and office layout), and ICT factors (ICT infrastructure, ICT tools type, and ICT know-how) as independent variables.

An outline of quantitative and qualitative research approach is provided with their justification. The qualitative questionnaire covers large number of the study's participants whereas the qualitative one covers few participants and intended for complementing the data supposed to be collected through quantitative method. The qualitative method allows the researcher to properly get the thoughts, experiences, ideas, opinions, suggestions and knowledge of the participants. The research models used and the hypotheses adopted are also discussed and presented here. Finally, the data collection procedure, ethical considerations and data quality management have been overlooked as well.

CHAPTER 4: DATA ANALYSIS, FINDINGS AND DICUSSION

4.1. Introduction

The purpose of this research is to investigate the factors affecting KS in EEU where the study population is comprised of head office and other four branches (Regions) in Addis Ababa. The corresponding research methodology also devised and justified to meet this intention in Chapter Three. Pertaining to this research methodology, the data was collected and organized in such a way that it can answer the research questions stated in Chapter One. Successively, in this Chapter the data was analyzed and presented as proper, then the interpretation and discussion steps follow.

The first sub-section of this Chapter presents the descriptive statistics part for each variable and the next focuses on a Bivariate (Correlation analysis) and Multivariate data analysis to deal with the association between two or more variables. Moreover, data collected using the qualitative method was analyzed and discussed thematically in the later sub-section and presented in text. Finally, the KS Framework developed based on identified KS factors affecting KS practice in EEU and its evaluation results presented. Then, the discussion part and this Chapter's summary included. in the same Chapter in detail.

4.2. Settings and Descriptive Statistics

4.2.1. Settings

The data was collected from EEU head office, East Addis Ababa Region, West Addis Ababa Region, North Addis Ababa Region and South Addis Ababa Region. The data collection methods were closed-ended self-administered questions and semi-structured face-to-face and one-to-one interview. The first part of the questionnaire is about the demographic profile of the employees while the second part focuses on KS constructs and incentive mechanisms. The third sub-section encloses the KS dimensions and KS practice in which each dimension populated further with Likert items. As noted in the research design Chapter, staffs with two or more years of experience and a minimum of first degree holders have been invited and participated.

Except the demographic variables, all the independent and dependent variables are assessed via five-point Likert scales ranging from "5=Strongly agree" to "1=Strongly disagree". The sample size for this study was drawn from EEU's Human Resource database placed at head Office. A proportional random stratified sampling method was used to select 232 participants from each units of study. Next, a systematic random sampling technique, the k^{th} item approach, was implemented to get the exact number of participants from each stratum. Then, the questionnaires were distributed in person. Following the distribution of the questionnaires, physical visits and phone calls were in place to check the process. Simultaneously, data cleaning and data preparation for analysis completed. Fifteen questionnaires were used for pre-test and excluded from analysis. Finally, a total of 189 questionnaires were returned which accounts 87% (rounded) response rate (Table 4.1). Of these returned questionnaires, 3 of them were found to be incomplete or invalid. Therefore, the remaining 185 (86%) were valid questionnaires and used for quantitative analyses (Table 4.1).

Table 4.1. Questionnaires Distribution and Return Rate Summary

Units of Analysis/Locations/	Questionnaires Distributed	Returned	Returning Rate	Returned and Valid
Head Office (HO)	101	93	92%	90%
Universal Condominium Electrification (HO)	11	10	91%	91%
ERP Project (HO)	22	18	82%	82%
Design Engineering and Localization (HO)	7	5	71%	71%
East Addis Ababa Region	23	16	70%	65%
West Addis Ababa Region	8	7	88%	88%
North Addis Ababa Region	23	22	96%	96%
South Addis Ababa Region	22	17	77%	77%
Total	217	188	87%	85%

4.2.2. Validity and Reliability of Data

For quantitative data analysis, issues of validity and reliability are important (Liao et al., 2007). In order to check the internal reliability, the Cronbach alpha was calculated using SPSS ver. 20. The overall Cronbach alpha coefficient obtained for the KS questionnaire was 0.939 for the total of 54 items (Table 4.2). Since the total value is above 0.7, the instrument (scale) can be supposed to be reliable and credible (De Vaus, 1986; Pallant in Castro, 2008; Martins & Meyer, 2012). In addition to this, the literature review was assumed to support the internal validity of the data.

Table 4.2. Reliability Statistics

RELIABILITY STATISTICS		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.939	.942	54

Source: Own Study

4.2.3. Univariate Analysis

Univariate variable analysis is the process of performing statistical examination in to only one variable at a time from out of a board of many items. Consequently, this sub-section focuses on a Univariate analysis of several items. Therefore, demographic profiles, KS incentive scheme inclination, KS awareness, Trust in KS, Personality, Organizational Structure, Organizational Culture, ICT Infrastructure, ICT Know-How, ICT Tools Type, NOK and KS practice items were over seen.

4.2.3.1. Demographic Statistics

Demographic data is significant to know distribution of the respondents' gender, age, educational and job experience and other raw facts. Depending on the purpose of the study, the demographic data benefits to look at the presence of association between the employees' background information and their behavior, attitude and awareness they have towards knowledge sharing. However, for this research, participants' demographic data descriptions summarized independently below (Table 4.3-4.8).

- **Distribution of respondents across units of study**

The first demographic item is about the distribution of respondents across units of study based on the returned questionnaires. As shown in Table 4.3, the Head office contributes the highest participants by 67% and North Addis Ababa and South Addis Ababa are the second and the third one with 11.9% and 9.2% in their order. On the contrary the least contributor is West Addis Ababa Region which is 3.8% only. This is because of that fifteen participants were taken for pre-test purpose from the total sample size.

Table 4.3. Respondents Distribution Across Office Location (n=185)

OFFICE DIVISION			
Office Location		Percent	Cumulative Percent
	Head Office	67.0	67.0
	East Addis Ababa	8.1	75.1
	West Addis Ababa	3.8	78.9
	North Addis Ababa	11.9	90.8
	South Addis Ababa	9.2	100.0
	Total	100.0	

- **Gender Distribution**

The second demographic item is Gender. The Gender distribution of the participants seems swerved much. The Males stood on 70.3% and Females are only 29.7% exactly (Table 4.4).

Table 4.4. Gender Distribution (n=185)

GENDER			
Gender		Percent	Cumulative Percent
	Male	70.3	70.3
	Female	29.7	100.0
	Total	100.0	

- **Age Group Distribution**

In the case of age group distribution, the 29-34 groups cover 30.3% (rounded) (Table 4.5) and 23-28 becomes the second one with 22.7% (rounded) and the third age group, 35-40, covers 19.5% which implies that 23-46 age group falls in a total of 80.1% (Table 4.5).

Table 4.5. Age Group Distribution (n=185)

AGE GROUPE			
Age Interval		Percent	Cumulative Percent
	23-28	22.7	22.7
	29-34	30.3	53.0
	35-40	19.5	72.4
	41-46	7.6	80.0
	47-52	12.4	92.4
	>52	7.6	100.0

- **Higher Education Level**

About 82.7% of the respondents are first degree holders and 16.8% Master's degree (Table 4.6). Regarding to doctoral degree it only shows 0.5% (Table 4.6).

Table 4.6. Education Level Distribution (n=185)

HIGHER EDUCATION			
Education Level		Percent	Cumulative Percent
	First Degree	82.7	82.7
	Graduate	16.8	99.5
	Doctoral Degree	.5	100.0
	Total	100.0	

- **Employees' Department Distribution**

EEU has made several organizational structure changes so far and the current list may not be exhaustive in their human resource database. As a result, the 26.5% participants are from Other departments (Table 4.7) and 16.8% of the respondents are from Distribution department which is one of the core departments in EEU. Finance and Controls department also accounts 15.7% followed by Human Resource and PGS which is 12.4% (Table 4.7).

Table 4.7. Participants Department Distribution (n=185)

DEPARTMENT ON WHICH EMPLOYEES WORKING			
Department		Percent	Cumulative Percent
	Distribution	16.8	16.8
	Energy Management	3.2	20.0
	Engineering Design and Localization	4.3	24.3
	Finance and Controls	15.7	40.0
	Human Resource and PGS	12.4	52.4
	Communications	4.9	57.3
	ICT	8.1	65.4
	EHS, Quality and PE	2.2	67.6
	Enforcement	3.2	70.8
	Technical Audit	2.7	73.5
	Others	26.5	100.0
	Total	100.0	

- **Employees Work Experience**

As illustrated in Table 4.8, the majority of the staffs have 6-10 years of experience which accounts 27.6%, then 11-15 years of experience follows by 24.9%. The employees in the early years of experience, 2-5, contributes 21.1%. The employees who have 16-25 years of experience are 11.3% in joint while >25 years of experience employees have a significant value than this age group which is 16.2% (Table 4.8).

Table 4.8. Participants' Work Experience (n=185)

WORK EXPERIENCE IN EEU			
Experience Years		Percent	Cumulative Percent
	2-5	21.1	21.1
	6-10	27.6	48.6
	11-15	24.9	73.5
	16-20	5.4	78.9
	21-25	4.9	83.8
	>25	16.2	100.0
	Total	100.0	

4.2.3.2. Knowledge sharing and Constructs

4.2.3.2.1. Job Familiarity Mechanisms

Majority of the employees became familiar to their job through Training and Documented materials in joint and self-study and colleagues' mechanisms at the same time. Each mechanism accounts 16.2% and 20.0% respectively (Table 4.9). On the contrary, training accounts (8.1%) proportionally low while 18.4% of the respondents came across through multiple methods (Table 4.9).

Table 4.9. Mechanisms how the Employees became Familiar with their Job (n=185)

MECHANISMS HOW THE EMPLOYEES BECAME FAMILIAR WITH THEIR JOB		
Mechanisms	Percent	Cumulative Percent
Training	8.1	8.1
Training + Documented Materials	16.2	24.3
Documented Materials	4.9	29.2
Self-study	5.9	35.1
Self-study+ Training	14.1	49.2
Self-study + Documented Materials	11.4	60.5
Self-study + Colleagues	20.0	80.5
Other	1.1	81.6
Multiple	18.4	100.0
Total	100.0	

4.2.3.2.2. Time Consumed to become Familiar with Job

Of the respondents, 41.6% employees spent less than 3 months to become familiar with their job (Table 4.10). Among the respondents, 21.6% and 15.7% of the employees became familiar with their job within three and six months respectively (Table 4.10). This signifies that 78.9% employees became familiar with their jobs within six months in general. The remaining 21.1% staffs spent more than seven months and half of them (10%) paid more than one year to meet the same status (Table 4.10).

Table 4.10. Time expended by Employees to become familiar with their Job (n=185)

TIME EXPENDED BY EMPLOYEES TO BECOME FAMILIAR WITH THEIR JOB			
	Time Expended	Percent	Cumulative Percent
	<3 Months	41.6	41.6
	3 Months	21.6	63.2
	6 Months	15.7	78.9
	7-9 Months	4.9	83.8
	10-12 Months	6.5	90.3
	>1 Year	9.7	100.0
	Total	100.0	

4.2.3.2.3. Knowledge Sharing Mechanisms used

- **Electronic-base KS Mechanisms**

Among the respondents, 28.6% use email to share knowledge (Table 4.11) On the contrary 21% of the respondents did not use any kind of electronic means of communications to share knowledge while the same percent of the employees use multiple ways of knowledge sharing options (Table 4.11). The employees who did not use any kind of electronic means is significant in number.

Table 4.11. Electronic Knowledge Sharing Mechanisms Used (n=185)

ELECTRONIC KNOWLEDGE SHARING MECHANISMS USED			
	Electronic KS Mechanisms	Percent	Cumulative Percent
	email	28.6	28.6
	web portal	3.2	31.9
	Groupware	8.1	40.0
	Social Media	7.0	47.0
	Knowledge Base	8.1	55.1
	Webinar	1.6	56.8
	Video Conference	1.1	57.8
	Tele conference	1.1	58.9
	None	21.1	80.0
	Multiple	20.0	100.0
	Total	100.0	

- **Face-to-Face KS Mechanisms**

As shown in Table 4.12, most respondents use multiple mechanisms to share knowledge which constituents 40.5%. Meeting and Training take the second place by contributing 19.5% each (Table 4.12). On the other hand, discussion forum takes the fourth place by 11.4%. The remaining knowledge sharing mechanisms have almost 9.1% which is lower. Therefore, the multiple mechanisms (40.5%) could be a combination of training and meeting (Table 4.12).

Table 4.12. Face to Face Knowledge Sharing Mechanisms used (n=185)

FACE TO FACE KNOWLEDGE SHARING MECHANISMS USED			
Face to Face KS Mechanisms		Percent	Cumulative Percent
	Discussion forum	11.4	11.4
	Meeting	19.5	30.8
	Training	19.5	50.3
	Symposium	.5	50.8
	Workshop	4.3	55.1
	Seminar	.5	55.7
	Conference	1.6	57.3
	Other	2.2	59.5
	Multiple	40.5	100.0
	Total	100.0	

4.2.3.2.4. Knowledge Sharing Incentive Scheme

Eight type of KS incentive mechanisms were offered for the participants to ratify them with Likert Scale rating. Based on the result found, 66.5% of the respondents support Monetary incentive scheme for effective KS (Table 4.13). For Career development, 69.6% staffs favor it as a good option for KS incentive mechanism. Promotion and Gaining expert status incentive mechanisms have supported by 63.7% and 62.7% respondents respectively (Table 4.13). About 35.7% of the respondents agree and 37.8% strongly agree to Acknowledgement incentive mechanisms in a total of 76.5% respondents are in approval of it. On the other hand, Convenience organizational structure takes a 63.5% support and 70.8% of the respondent agree on the type of ICT tools to motivate the knowledge sharing behavior and attitude of the employees. Finally, further education and training opportunities scores 71.3% support to be used as KS incentive mechanism (Table 4.13).

Table 4.13 Percent and Mean Score for Knowledge Sharing Incentive Scheme (n=185)

Knowledge Sharing Incentive Mechanisms	S. Disagree	Disagree	Neutral	Agree	S. Agree	Mean Score	Std. Deviation
Monetary incentives (salary increment, extra time payment etc.)	9 4.9%	26 14.1%	27 14.6%	88 47.6%	35 18.9%	3.62	1.09
Career development	7 3.8%	24 13%	28 15.1%	70 38.8%	56 30.3%	3.78	1.13
Promotion	9 4.9%	23 12.4%	35 18.9%	70 37.8%	48 25.9%	3.68	1.13
Gaining status as expert	10 5.4%	18 9.7%	41 22.2%	74 40.0%	42 22.7%	3.65	1.10
Acknowledgement of your contribution	6 3.2%	10 5.4%	33 17.8%	66 35.7%	70 37.8%	3.99	1.04
Less complex and less centralized organizational structure	11 5.9%	25 13.5%	37 20.0%	85 48.9%	27 14.6%	3.50	1.08
ICT tools that are simple and easy to use	10 5.4%	19 10.3%	25 13.5%	74 40.0%	57 30.8	3.81	1.14
Getting further Education or advanced training opportunity	19 10.3%	23 12.4%	11 5.9%	57 30.8%	75 40.5%	3.79	1.36
Overall Score						**3.73**	**0.85**

As it can be seen from Table 4.13, the mean values of each KS incentive mechanisms and overall mean score are above 3.5 which is closer to the value of agree. This implies the potential of each KS mechanisms to motivate employees if used. Moreover, it is understood that Acknowledgement, ICT tools type, Career development, Promotion and Monetary incentive have the highest mean value that affirms the potential they hold to speed up KS practice in their list of order. However, the overall results confirm that all KS incentive mechanisms can be implemented to enhance KS practice among employees.

4.2.3.2.5. Individual Knowledge Sharing Factors

- **Knowledge Sharing Awareness**

There are five Likert items listed here to ask employees about KS awareness. The first item is about the importance of KS. On this item, 80.5% of the participants replied that they are aware of the importance of KS while 10.8% respondents are not aware (Table 4.14). The next point was 'KS helps the employees not to repeat the same mistake'. In this regard, 77.3% of the respondents agree with the point and 17.2% of the respondents do not agree with this statement.

Statistically it is significant to be a barrier for KS practice among employees and as an institution in general. On the other hand, 86% participants believe that engaging in KS activities can create opportunities to gain new ideas. While, 10.8% reflects their disagreement and 3.2% decide indifferent. The other item is the role of KS to speed up fast learning. About 81% of the participants believe that KS has a potential to speed up fast learning process while 13% of the respondents do not agree with it (Table 4.14).

Finally, the last item was about the role of KS to increase the productivity and customer satisfaction. In this case, 71.9% of the respondents believe that KS can increase productivity and customer satisfaction where 11.3% of the respondents do not agree on the same point. The average cumulative score of all items shows that 80.5% of the respondents are aware about KS (Table 4.14).

Table 4.14. Percent and Mean Score for Knowledge Awareness (n=185)

Knowledge Sharing Awareness	S. Disagree	Disagree	Neutral	Agree	S. Agree	Mean Score	Std. Deviation
I am aware of the importance of knowledge sharing in daily work	4 2.2%	16 8.6%	16 8.6%	89 48.1%	60 32.4%	4.00	0.998
Knowledge sharing helps not to repeat the same mistake	16 8.6%	16 8.6%	10 5.4%	76 41.1%	67 36.2%	3.88	1.24
I believe I would gain new ideas, technologies, skills or techniques by sharing knowledge	13 7.0%	7 3.8%	6 3.2%	77 38.4%	88 47.6%	4.16	1.13
I believe knowledge sharing helps to learn faster	17 9.2%	7 3.8%	11 5.9%	75 40.5%	75 40.5%	3.99	1.21
My colleagues know that sharing knowledge increases the productivity of their organization and customer satisfaction	11 5.9%	10 5.4%	31 16.8%	82 44.3%	51 27.6%	3.82	1.08
Overall Score						**3.97**	**0.92**

In summary, Table 4.14 illustrates that all items have a mean value and overall mean score closer to the value of agree for this research which supports the above results. Therefore, the mean value describes that most respondents have awareness about KS in terms of the importance, increasing productivity and customer satisfaction and other list of points.

- **Trust on Knowledge Sharing**

Three Likert items were included under this KS factor. Of the respondents, 60.5% trust colleagues' knowledge due to accuracy and credibility where 13.5% of the participants do not trust their colleagues' knowledge (Table 4.15). The remaining 25.9% decide indifferent which is statistically significant. The overall statistics shows that trust has the potential to upset KS practice among employees in EEU. The next item probes the confidence of other employees about his/her knowledge and capability; 64.8% of the staffs replied that his/her colleagues have confidence on his/her knowledge and capability. This result is almost the same as the first item (Trust) findings. Moreover, the 25.9% indifferent response is almost equal to the first item again (Table 4.15).

The last point is about the fear of employees' knowledge that his/her knowledge might be misused by taking unjust credit or for bad intention. Among the respondents, 37.8% have fear that their knowledge might be miss-used by taking unjust credit or for bad intention while 36.2% of the respondents do not have (Table 4.15). Therefore, 38% staffs do not share knowledge with their colleagues due to this fear. Statistically this is significant and describes the level of employees fear and abstain to share knowledge. Moreover, this statistic might show the reality about KS among employees in EEU comparing to the above two outcomes. In addition, the mean value (2.99) for this item illustrated in Table 4.15 is below the value of 'Agree' that supports the above statistics. The overall mean score is closer to the neutral value. (Table 4.15)

Table 4.15. Percent and Mean Score for Trust on Knowledge Sharing (n=185)

Trust on Knowledge Sharing	S. Disagree	Disagree	Neutral	Agree	S. Agree	Mean Score	Std. Deviation
I trust knowledge of my co-workers due to accuracy and credibility	5 2.7%	20 10.8%	48 25.9%	92 49.7%	20 10.8%	3.55	0.92
My colleagues feel very confident on my skill and knowledge or capability	5 2.7%	12 6.5%	48 25.9%	90 48.6%	30 16.2%	3.69	0.91
Employees share knowledge without the fear that his/her knowledge is being misused by taking unjust credit or bad intention	19 10.3%	48 25.9%	48 25.9%	55 29.7%	15 8.1%	2.99	1.14
Overall Score						**3.41**	**0.55**

- **Personality on Knowledge Sharing**

Employees' Personality affects KS activities in many aspects. Under this KS factor, five questions were delivered to the respondents. The first item was about how much the employees are extrovert or open to share knowledge. The result shows that 74.6% of the participants have extrovert personality and open to share knowledge to their colleagues while 9% assert that they do not have such kind of personality (Table 4.16). Regarding to helping others by sharing knowledge item, 85.4% of the employees have the behavior of helping other by sharing knowledge which is statistically significant. Next, the confidence of the participants on their ability to provide knowledge for others was weighed. The findings show that 79.4% of the respondents have confidence on their own ability to provide knowledge for others. However, 10.8% of the respondents do not have (Table 4.16).

The fourth item measures the belief of the employees towards building up an attitude of perceiving knowledge as a power and abstain from sharing their knowledge for others. A total of 50.3% employees prefer sharing knowledge rather than hoarding it while 49% consider knowledge as power so that they do not share with colleagues (Table 4.16). In the case of 'cooperate rather than compete with colleagues' question, the response shows that 70.8% of the employees cooperate rather than compete with colleagues while 14.1% of the respondents compete with their colleagues (Table 4.16).

Table 4.16. Percent and Mean Score for Personality on Knowledge Sharing (n=185)

Personality	S. Disagree	Disagree	Neutral	Agree	S. Agree	Mean Score	Std. Deviation
I am an extrovert type of person (like to know what is happening, socialize and open minded)	12 6.5%	6 3.2%	29 15.7%	101 54.6%	37 20%	3.78	1.01
I enjoy helping colleagues by sharing my knowledge	9 4.9%	4 2.2%	14 7.6%	87 47.0%	71 38.4%	4.12	0.99
I am confident in my ability to provide knowledge that others in my organization consider valuable one	9 4.9%	11 5.9%	18 9.7%	92 49.7%	55 29.7%	3.94	1.04
Employees in my organization do not share knowledge because they think knowledge is power	16 8.6%	29 15.7%	47 25.4%	68 36.8%	25 13.5%	3.31	1.15
I would rather cooperate with colleague than compete with them	12 6.5%	14 7.6%	28 15.1%	86 46.5%	45 24.3%	3.75	1.11
Overall Score						**3.78**	**0.70**

As shown in Table 4.16, the highest mean is achieved on item "I enjoy helping colleagues by sharing my knowledge" which ratifies 85.4% agreement. However, in item "Employees in my organization share knowledge because they don't think knowledge is power" the mean value is closer to neutral or below agree which reflects that employees are hoarding knowledge. The other Likert items have a mean value closer to agree for this research and implies most respondents have similar attitude towards these bundle of questions. That means, majority of the employees have extrovert and open personality, they also enjoy helping others by sharing knowledge, they are confident about their own knowledge and capability and they cooperate with colleagues rather than compete. The overall mean value is closer to agree that implies larger employees have good personality to share knowledge (Table 4.16)

- **Employees' Job Satisfaction**

An employee who is satisfied with his/her daily job is more likely to engage in knowledge sharing than those that is not satisfied. So, an assessment was under taken to understand the job satisfaction of the employees. Based on the results found, 51.3% employees are not satisfied with their daily work (Table 4.17). Only 25.4 % of the participants are satisfied in their daily job. The other 23.3% gone to neutral which is difficult to interpret (Table 4.17). The result paints statistically significant worth that employees' daily work satisfaction is in risk. Moreover, the smaller mean value (2.59) of this item is closer to neutral (below agree) asserts that significant number of employees' job satisfaction is running-down (Table 4.17). However, under this condition 68.1% of the participants share knowledge often.

Table 4.17. Percent and Mean Score for Job Satisfaction (n=185)

Job Satisfaction	S. Disagree	Disagree	Neutral	Agree	S. Agree	Mean Score	Std. Deviation
In my organization employees are happy with their daily work	35 18.9%	60 32.4%	47 25.4%	31 16.8%	12 6.5%	2.59	1.16
I often share knowledge with my colleagues in EEU	9 4.9%	22 11.9%	28 15.1%	98 53.0%	28 15.1%	3.62	1.04
Overall Score						**3.11**	**0.84**

4.2.3.2.6. Organizational Knowledge Sharing Factors

- **Rewards and Recognitions**

Motivation has been recognized as an important trigger for sharing and acquiring knowledge (Al-Salti Z, 2009). According to Gold et al. (2001) cited in Al-Salti Z (2009), motivation and incentive systems should be structured so that individuals are motivated and rewarded for taking the time to acquire and use new knowledge and share it with others. Largely, the literature suggests the greater the overall motivation – or reward - then the greater the willingness to KS (Liu & Fang), regardless if it is intrinsic or extrinsic by nature (Manus, 2016). Taking this fact in to consideration, the following findings presented for the practice of rewards and recognitions scheme in EEU.

About 65.9% of the respondents said that employees who share knowledge do not get any rewards and recognition (Table 4.18). Statistically, it is a big sign for absence of KS incentive mechanisms in EEU. On the other hand, 15.7% of the respondents assert the practice of rewards and recognitions in due of sharing knowledge (Table 4.18). The other item is about the bonus and promotion employees getting in return to their knowledge sharing with colleague. Majority of the respondents, 64.4%, do not get bonus and promotion in return to knowledge sharing where 21.1% of the employees get bonus and promotion (Table 4.18). Moreover, the mean values (2.30 and 2.39) of the two items presented under Table 4.18 is below agree. This implies that the presence of reward and recognition gaps in the institution in due of sharing knowledge among employees.

Table 4.18. Percent and Mean Score for Rewards and Recognitions (n=185)

Rewards and Recognitions	S. Disagree	Disagree	Neutral	Agree	S. Agree	Mean Score	Std. Deviation
In my organization employees are happy with their daily work	47 25.4%	75 40.5%	34 18.4%	19 10.3%	10 5.4%	2.30	1.12
I often share knowledge with my colleagues in EEU	46 24.9%	73 39.5%	27 14.6%	26 14.1%	13 7.0%	2.39	1.20
Overall Score						**2.44**	**0.98**

- **Organizational Structure**

The first question is about the flexibility and adoptability of organization structure in changing environment to share knowledge easily. In this case, 24.9% employees affirm that EEU's organizational structure is flexible and adoptable easily for changing environment respective to KS (Table 4.19). But 56.3% of the respondents do not agree with this idea. They describe the organizational structure as it lacks flexibility and adoptability easily for changing environment respective to KS. From the perspective of hierarchical or parallel nature of organizational structure, 43.8% of the participants perceive it as parallel (not hierarchical) where 28.1% respondents describe it as hierarchical (not parallel) so that it is not conducive for KS (Table 4.19).

In the case of organizational structure complexity and centralization, 41.1% of the respondents say the EEU organizational structure is static which is characterized by complex and centralized where the 34% stands on opposite sideways. A complex and centralized organizational structure is a barrier for KS. Furthermore, the mean values describe that EEU's organizational structure is not conducive to share knowledge since the mean values are below agree (Table 4.19).

Table 4.19. Percent and Mean Score for Organizational Structure (n=185)

Organizational Structure	S. Disagree	Disagree	Neutral	Agree	S. Agree	Mean Score	Std. Deviation
The organizational structure in EEU is flexible and adoptable for changing-environment to share knowledge easily	41 22.2%	63 34.1%	35 18.9%	41 22.2%	5 2.7%	2.49	1.14
The EEU organizational structure emphasize on parallel relations (not hierarchical) rather than vertical ones formality so that conducive to share knowledge	24 13.0%	57 30.8%	52 28.1%	47 25.4%	5 2.7%	2.74	1.06
The EEU organizational structure is not static one which is recognized by characters such as less complexity and centralization that facilitates knowledge Sharing	13 7.0%	63 34.1%	46 24.9%	50 27.0%	13 7.0%	2.93	1.08
Overall Score						**2.72**	**0.75**

- **Organizational Culture**

The organizational culture respect to KS have been evaluated using five items to understand how much the EEU overlay the ground to facilitate the KS activity among employees. On the first item, 29.7% employees believe that EEU encourages new idea and focuses on learning from failure where 47.5% of the respondents do not agree with this say (Table 4.20). Similarly, the second item is evaluated and 32.9% of the employees believe that EEU consults team members before making a decision while 42.7% of the participant judge EEU doesn't consult the team members before making a decision (Table 4.20). In the case of encouraging team work about KS, 39.5% employees responded the EEU has no such kind of organizational values. On the contrary, 38.4% of the participated staffs assert that EEU encourages group interaction (Table 4.20).

The formal and informal meeting culture of the EEU was also weighed. In this regard, 38.6% of the respondents agree with the existence of periodic meeting among departments working in different team while 39.5% of the participants do not agree with this idea (Table 4.20). The last question is about the presence of any kind of informal meetings to share knowledge. About 32.4% of the employees replied that there is informal meeting to share knowledge in EEU but 44.4% of the respondents affirm the absence of informal meetings to share knowledge (Table 4.20). The above statistics show that the insufficiency of periodic formal and informal meetings to share knowledge. Moreover, the mean value of each item is below agree that supports the above statement (Table 4.20).

Since KS is greatly influenced by organisational culture, the beliefs and values which an organisation holds, are of great importance to the understanding of employee behavior and interaction (Alavi et al. 2005; Manus, 2016). Thus, the culture of an organization has the potential to facilitate or constrain knowledge sharing and acquisition (Al-Salti Z, 2009). Many researchers suggest that organisational culture has the most critical input into KM initiatives, a component of which is KS (Al Saifi 2015; Manus, 2016). It has also been suggested that organisational culture can have a higher determinant on whether employees are willing to share knowledge regardless of the directives coming from senior management (Suppiah & Sandhu 2011; Manus, 2016). Therefore, EEU may need an improvement actions in this area.

Table 4.20. Percent and Mean Score for Organizational Culture (n=185)

Organizational Culture	S. Disagree	Disagree	Neutral	Agree	S. Agree	Mean Score	Std. Deviation
My organization encourages new idea and focus on learning from failure	23 12.4%	65 35.1%	42 22.7%	44 23.8%	11 5.9%	2.76	1.13
My organization consults team members to make decision and solve problem	23 12.4%	56 30.3%	45 24.3%	50 27.0%	12 5.9%	2.84	1.14
My organization encourages group interaction (team work) regarding knowledge sharing	21 11.4%	52 28.1%	41 22.2%	61 33.0%	10 5.4%	2.93	1.13
In the EEU, there is periodic meetings in which people working in different teams, department may participate	23 12.4%	52 28.1%	39 21.1%	64 34.8%	7 3.8%	2.89	1.13
There is informal (spontaneous hallway meetings or over a cup of coffee) knowledge sharing practice within EEU	26 14.1%	56 30.3%	43 23.2%	45 24.3%	15 8.1%	2.82	1.19
Overall Score						**2.85**	**0.83**

- **Office Layout**

The physical design of EEU is considered as open concept office and favorable for knowledge sharing in the eyes of 33.5% participants but not for 50.2% respondents (Table 4.21). In the other case, 41.6% of the staffs participated in the study agree that the EEU physical work environment and lay out restricts KS activities but 38.4% of the employees support the other side (Table 4.21). According to the researcher's direct observation, there are departments dispersed in different places actually which should be in one place. Moreover, the physical office layout in the South Addis Ababa and West Addis Ababa Regions have the potential to restrict KS practice among employees. Moreover, the smaller mean values which is less than agree conveys a message that EEU office layout could restrict effective KS among employees (Table 4.21).

Table 4.21. Percent and Mean Score for Office Layout (n=185)

Office Layout	S. Disagree	Disagree	Neutral	Agree	S. Agree	Mean Score	Std. Deviation
The physical design of my office layout is open which can facilitate knowledge sharing in the EEU easily.	28 15.1%	65 35.1%	30 16.2%	50 27.0%	12 6.5%	2.75	1.20
Physical work environment and layout of work areas not restrict effective knowledge sharing in my organization, EEU	11 5.9%	66 35.7%	37 20.0%	50 27.0%	21 11.4%	3.02	1.15
Overall Score						**2.88**	**0.71**

- **Work Process**

This is also another component of organizational factor that was evaluated with two Likert items. On the first item or question that states as "knowledge sharing is integrated or included into daily work of the EEU", 42.1% of the employees agree with the statement and equally 39.4% of the respondents replied that KS is not integrated into daily work process (Table 4.22). The statistical values are adjacent each other. However, the percent of employees who disagree on the presence KS integration into daily work process needs attention. Regarding to the existence of a system that could locate the employees with whom they can share knowledge when they are in need of knowledge or help, 55.1% of the participants responded as there is no such kind of system put in place while 25.4% believe the existence of the system (Table 4.22). The employees who believe the absence of system to locate knowledge is more than twice comparing to the respondents who believe the existence of the system for the same purpose. As illustrated in Table 4.22, the lower mean value which is than agree also supports the gap in this regard.

Table 4.22. Percent and Mean Score for Work Process (n=185)

Work Process	S. Disagree	Disagree	Neutral	Agree	S. Agree	Mean Score	Std. Deviation
Knowledge Sharing is integrated or included into daily work process (processes and procedures involved when doing a particular job) of my organization, EEU.	18 9.7%	58 31.4%	36 19.5%	65 35.1%	8 4.3%	2.93	1.11
There is a system put in place to identify the colleagues with whom I need to share my knowledge	25 13.5%	77 41.6%	36 19.5%	32 17.3%	15 8.1%	2.65	1.16
Overall Score						**2.79**	**0.87**

4.2.3.2.7. ICT Factors

- **ICT Infrastructure**

About 48.6% of the respondents agree that up to date physical ICT infrastructure is implemented in EEU. But 37.9% of the participants do not agree with this statement (Table 4.23). On the other hand, 45.9% of the respondents agree on the absence of a system and process aiming at serving the purpose of KS while 33% respondents claim as there is a system and process to plateful KS in EEU (Table 4.23).

However, the lower mean value distribution comparing to the value of 'Agree' depicts the insufficiency implementing of up to date physical ICT infrastructure and a system and process put in place to share knowledge among employees (Table 4.23).

Table 4.23. Percent and Mean Score for ICT Structure (n=185)

ICT Infrastructure	S. Disagree	Disagree	Neutral	Agree	S. Agree	Mean Score	Std. Deviation
Up to date physical Information Communication Technology and infrastructure (internet, intranet) are available in the EEU	24 13.0%	46 24.9%	25 13.5%	77 41.6%	13 7.0%	3.05	1.21
ICT systems and processes are put in place in my organization to share knowledge.	23 12.4%	62 33.5%	39 21.1%	49 26.5%	12 6.5%	2.81	1.15
Overall Score						**2.93**	**1.07**

- **ICT Know-How**

The physical ICT implementation is not an end but a start to facilitate KS activities. Therefore, employees' know-how on how to use it effectively be the next subject. In this regard, three Likert items have been delivered to assess employees' know-how about physical ICT infrastructure to share knowledge with their colleagues. The first Likert items shows that 47% participants do not have adequate know-how to use (Table 4.24). ICT implemented for sharing knowledge while 22.7% of the employees have the literacy in this case (Table 4.24). The above results depict that almost half of the staffs are not literate in using ICT infrastructure implemented in EEU.

In the case of the second item, 47% of the employees confirm that they don't have use the physical ICT infrastructure such as internet, email to communicate and share knowledge at all (Table 4.24). For the same point, only 30% respondents have custom of using the physical ICT infrastructure such as internet, email to communicate and share knowledge (Table 4.24). Recall that 21.1% of the employees do not use any kind of electronic means of communications to share knowledge (Table 4.11). The third item is about the extent in which employees use electronic storage to access knowledge.

In this case, 49.8% of the staffs responded that they do not have such kind of practice while 28.7% employees are using the electronic storage to access knowledge. The smaller mean value which is below the value of 'Agree' shows the big gaps in ICT know-how among employees to communicate and share knowledge (Table 4.24).

Table 4.24. Percent and Mean Score for ICT Know-How (n=185)

ICT Know-How	S. Disagree	Disagree	Neutral	Agree	S. Agree	Mean Score	Std. Deviation
EEU employees have sufficient know-how or literacy on using ICT systems implemented for knowledge sharing	22 11.9%	65 35.1%	56 30.3%	39 21.1%	3 1.6%	2.65	0.99
In the EEU, employees use knowledge networks such as (email, intranet, internet and other ICT systems) to communicate and share knowledge with colleagues	23 12.4%	63 34.1%	42 22.7%	49 26.5%	8 4.3%	2.76	1.11
Employees make extensive use of electronic storage(such as databases) to access knowledge	29 15.7%	63 34.1%	40 21.6%	46 24.9%	7 3.8%	2.67	1.13
Overall Score						**2.70**	**1.90**

- **ICT Tools Type**

The existing ICT tools implemented in EEU is not suitable for 45.2% of the respondents to share knowledge. On the other hand, 34% of the participants agree that the ICT tools are proper to share knowledge (Table 4.25). In the case of ICT user-friendliness in nature, 49.8% respondents confirm that the ICT tools are not user-friendly while 24.3% of the employees disagree with the above judgment (Table 4.25). The last item is about the usefulness of ICT tools about knowledge sharing activities. Of the participated employees, 43.8% reflected their disagreement meaning the ICT tools are not useful to share knowledge where 15.7% of the respondents agree on the statement (Table 4.25). The remaining 40.6% employees decide to stay indifferent which is statistically significant. In summary, the lower mean value comparing to the value of 'Agree' show that ICT suitability, user-friendliness and usefulness have a limitation (Table 4.25).

Table 4.25. Percent and Mean Score for ICT Tools Type (n=185)

ICT Tools Type	S. Disagree	Disagree	Neutral	Agree	S. Agree	Mean Score	Std. Deviation
Information Communication Technology tools implemented in EEU are suitable to share knowledge	30 16.2%	55 29.7%	37 20.0%	52 28.1%	11 5.9%	2.78	1.19
My organization has user-friendly information technology systems which support employees to sharing knowledge easily	29 15.7%	63 34.1%	48 25.9%	37 20.0%	8 4.3%	2.63	1.10
Information Communication Technology tools implemented in EEU is useful to share knowledge	26 14.1%	55 29.7%	29 15.7%	58 31.4%	17 9.2%	2.92	1.24
Overall Score						**2.78**	**1.02**

4.2.3.2.8. Nature of Knowledge

Tacit knowledge resides in the minds of individuals on the donor side and, therefore, it is not easy to be verbalized and written. This is consistent with the findings of previous researchers such as Szulanski (2003) and Szulanski, (1996) who argue that tacit knowledge is having 'sticky characteristics, which makes it difficult to be shared from the source to the recipient (Al-Salti Z. S., 2011). Additionally, the findings confirm the argument of Inkpen and Pien (2006) who explain that explicit knowledge can be shared relatively easily through formal learning and written documents such as manuals and operating instructions. However, tacit knowledge is often context specific and its transfer is much slower, costly, and uncertain (Al-Salti Z. S., 2011).

In this study, knowledge complexity was another key nature of knowledge-related factors that weighed by the participants to check its impact upon knowledge sharing practice in EEU. As Knowledge complexity was perceived to affect the understanding of the totality of knowledge and to weaken the possibility of knowledge sharing. For example, some business knowledge such as engineering arts were more difficult to share from donors because these were deeply embedded and highly dependent on broad contextual factors (Al-Salti Z. S., 2011).

As shown in the Table 4.26 below, 37% of the respondents believe that the nature of knowledge in EUU is complex while 42.5% of the employees do not agree on this judgement. The two values are almost nearby each other so that complexity of knowledge could have a potential to be a barrier for KS. The smaller mean value (2.9) as compare to the value of 'Agree' further signifies the nature of knowledge in EEU is somewhat complex.

Table 4.26. Responses Summary on Complexity of Knowledge in EEU (n=185)

NATURE OF KNOWLEDGE			
Complexity		Percent	Cumulative Percent
	Strongly Disagree	10.3	10.3
	Disagree	33.0	43.2
	Neutral	20.5	63.8
	Agree	30.8	94.6
	Strongly agree	5.4	100.0
	Total	100.0	

The other key components of nature of knowledge is knowledge tacitness. Based on this concept, the item provided to the respondents contemplated about the nature of knowledge in EEU as sticky (difficult to transfer verbally or in written form) has 40% support and not sticky (easy to do so) has 30% support (Table 4.27). The mean value is like that of complexity of knowledge so that the implication is also the same; the NOK in EEU is somehow sticky.

Table 4.27. Responses Summary on Tacitness of Knowledge in EEU (n=185)

NATURE OF KNOWLEDGE			
Tacitness		Percent	Cumulative Percent
	Strongly Disagree	7.6	7.6
	Disagree	21.6	29.2
	Neutral	28.6	57.8
	Agree	35.1	93.0
	Strongly agree	7.0	100.0
	Total	100.0	

4.2.3.2.9. Knowledge Sharing

- **Knowledge Sharing as a Component of Performance Evaluation**

The KS is the outcome section to this study which has seven items containing organizational and individual perspectives. The first item is to check the practice of EEU whether it integrates KS as a component of its performance evaluation activities or not. Subsequently, 54% of the respondents express their disagreement that EEU does not integrate KS as its performance evaluation activities while 31.4% of the employees assert the presence of this practice as shown in Table 4.28 below. Based on this result, more than fifty percent of the respondents agreed on the absence of KS integration as a performance evaluation component (Table 4.28) and the mean value (2.66) also supports the same result on this point where majority of the employees judge the absence of such kind of practice since the mean is below 'Agree' value.

Table 4.28. Responses on KS as Component of Performance Evaluation in EEU (n=185)

KNOWLEDGE SHARING			
As a Component of Performance Evaluation		Percent	Cumulative Percent
	Strongly Disagree	16.2	16.2
	Disagree	37.8	54.1
	Neutral	14.6	68.6
	Agree	26.5	95.1
	Strongly agree	4.9	100.0
	Total	100.0	

- **Knowledge sharing is Valued**

The other point is about the level that EEU furnished value to KS. In this case, 47.5% respondents replied that in EEU KS is not highly valued where 34.5% of the employees responded as EEU gives value to KS (Table 4.29). However, still the large number of employees' judgement (47.5%) implication is similar to the mean value (2.81).

Table 4.29. Responses on Knowledge Sharing is highly valued in EEU (n=185)

KNOWLEDGE SHARING			
Knowledge is highly Valued		Percent	Cumulative Percent
	Strongly Disagree	15.1	15.1
	Disagree	32.4	47.6
	Neutral	17.8	65.4
	Agree	25.9	91.4
	Strongly agree	8.6	100.0
	Total	100.0	

- **Retaining highly Skilled and Experienced Staffs' Tacit knowledge**

With the retirement of the aged staffs or staff turnover, specifically the senior electrical engineers in the electrical utility industry there is a managerial, organizational, and industrial need to capture their tacit knowledge before it is lost (Perjanik, 2016). According to this author, this is one of the challenging areas with the loss of know-how that bring about a significant risk to keep up working continuity. So, examining the practice of EEU in this regard therefore critical to strategize the mechanisms to capture tacit knowledge to retain this valuable asset.

As illustrated in Table 4.30, 61% of the respondents agree that highly skilled and experienced staffs' tacit knowledge is not captured at time of leaving the office for different reasons. The rest 22.2% of the respondents replied skilled and experienced staffs' tacit knowledge is being captured before they leave the office (Table 4.30). The statistics describes loud that there is a big gap in tacit knowledge retention of skilled and experienced staffs before they leave the institution (Table 4.30). This Likert item also has the smaller mean value (2.43) closer to disagree value that supports the above statistical narrative.

Table 4.30. Responses on Knowledge Retention in EEU (n=185)

KNOWLEDGE SHARING			
Knowledge Retention		Percent	Cumulative Percent
	Strongly Disagree	20.5	20.5
	Disagree	40.5	61.1
	Neutral	16.8	77.8
	Agree	19.5	97.3
	Strongly agree	2.7	100.0
	Total	100.0	

- **Comprehensive Motivational Scheme**

Motivation has been recognized as an important trigger for sharing and acquiring knowledge (Al-Salti Z., 2009). According to Gold *et al.* (2001) cited in Al-Salti Z. (2009), motivation and incentive systems should be structured so that individuals are motivated and rewarded for taking the time to acquire and utilize new knowledge and share it with others. On the other hand, according to Narteh (2008) in Al-Salti Z. (2009), it is found that poor remuneration for individuals who are assigned the responsibility of sharing and acquiring knowledge would tend to affect the knowledge acquisition efforts.

Based on the response result, 55.2% of the employees said that EEU does not have a comprehensive motivational scheme to motivate KS practice among employees, where only 17.9% participants accept the implementation of comprehensive motivational scheme to motivate KS practice in EEU (Table 4.31). Therefore, the statistics illustrates the absence of KS motivational scheme in EEU. The mean value (2.43) for this item is closer to the value of disagree implies that the statistical description illustrated in Table 4.31 is supported with it. Since motivational Scheme is an important trigger in facilitating knowledge sharing in any organization, the results shown in this study statistically bears a clear note on KS practice in EEU.

Table 4.31. Responses on Comprehensive Motivational Scheme in EEU (n=185)

KNOWLEDGE SHARING			
Motivational Scheme		**Percent**	Cumulative Percent
	Strongly Disagree	22.2	22.2
	Disagree	33.0	55.1
	Neutral	27.0	82.2
	Agree	15.7	97.8
	Strongly agree	2.2	100.0
	Total	100.0	

- **Knowledge Repository**

Knowledge repository or knowledge-base is one of the pervasiveness of an organization's effort and culture stretched to retain and share knowledge to facilitate its office functions. In other words, the point needs proper and effective attention. Therefore, as shown in Table 4.32, 47.1% of the respondents testify the absence of knowledge-base (repository) while 30.3% give their witness to the implementation of knowledge-base (repository) in EEU. Moreover, the mean value (2.71) is below the value of 'Agree' and denotes that majority of the employees agree on the absence of knowledge-base (repository).

Table 4.32. Responses on Knowledge Repository in EEU (n=185)

KNOWLEDGE SHARING			
Knowledge Repository		Percent	Cumulative Percent
	Strongly Disagree	15.7	15.7
	Disagree	31.4	47.0
	Neutral	22.7	69.7
	Agree	26.5	96.2
	Strongly agree	3.8	100.0
	Total	100.0	

- **Knowledge Sharing Practice among Employees**

As it can be seen from Table 4.33, 44.3% of the participants share knowledge regularly while 32.5% employees do not. Statistically, it indicates infrequent KS practice among employees in EEU. The mean value (3.06) which is below the value of 'Agree' also supports this result.

Table 4.33. Responses on Employees' Knowledge Sharing Routine in EEU (n=185)

KNOWLEDGE SHARING			
How often Employees Share Knowledge		Percent	Cumulative Percent
	Strongly Disagree	11.4	11.4
	Disagree	21.1	32.4
	Neutral	23.2	55.7
	Agree	38.4	94.1
	Strongly agree	5.9	100.0
	Total	100.0	

- **Motivational Level of Employees to Share Knowledge**

This Likert item is focusing about the motivation level of employees in EEU to share knowledge in their daily work. It is understood from Table 4.34 that 45% of the respondents replied EEU's employees are not motivated to share knowledge while 30.8% responded as they are motivated to share knowledge. However, statistically lack of motivation to share knowledge among employees is observed in this result. Because near to half of the staffs are not motivated to share knowledge. The mean value (2.79) which is below the value of 'Agree' again describes the lower motivation that exist among the employees.

Table 4.34. Responses on Employees' Motivation to Share Knowledge in EEU (n=185)

KNOWLEDGE SHARING			
Employees are Motivated to Share Knowledge		Percent	Cumulative Percent
	Strongly Disagree	13.0	13.0
	Disagree	32.4	45.4
	Neutral	23.8	69.2
	Agree	24.3	93.5
	Strongly agree	6.5	100.0
	Total	100.0	

4.2.3.2.10. Cross Tabulation Analysis

Depending on the purpose of the study, the demographic data benefits to look at the presence of association between the employees' background information and their behavior, attitude and awareness they have towards knowledge sharing. Therefore, in this section Trust and Awareness are cross tabulated with Gender, Age Group and Education Level to look at the association between demographic profile and KS factors noted above.

- **The awareness of respondents across Gender**

As shown in Table 4.35, 78.5 % of Males and 84.4% Females have awareness about KS with in Gender. In the same fashion, 11.5% of Males and 9.1% Females are not aware of KS. The statistics shows that in both cases that means being aware and not Females have greater value.

Table 4.35. Cross Tabulation on KS Awareness Across Gender (n=185)

Gender * I am aware of KS Cross Tabulation								
			Awareness about KS					Total
			Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	
Gender	Male	Count	4	11	13	59	43	130
		% within Gender	3.1%	8.5%	10.0%	45.4%	33.1%	100.0%
		% within Awareness	100.0%	68.8%	81.2%	66.3%	71.7%	70.3%
		% of Total	2.2%	5.9%	7.0%	31.9%	23.2%	70.3%
	Female	Count	0	5	3	30	17	55
		% within Gender	0.0%	9.1%	5.5%	54.5%	30.9%	100.0%
		% within Awareness	0.0%	31.2%	18.8%	33.7%	28.3%	29.7%
		% of Total	0.0%	2.7%	1.6%	16.2%	9.2%	29.7%
Total		Count	4	16	16	89	60	185
		% within Gender	2.2%	8.6%	8.6%	48.1%	32.4%	100.0%
		% within Awareness	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	2.2%	8.6%	8.6%	48.1%	32.4%	100.0%

- **Employees' Trust on KS Across Gender**

About 59.3% of Male respondents have trust on KS and 63.6% Female participants have trust on KS with in Gender. Similarly, 11.6% of Males do not have trust on KS while 18.2% of Females do not have trust on KS (Table 4.36).

Table 4.36. Cross Tabulation for Trust on KS Across Gender (n=185)

Gender *Trust on KS Cross Tabulation								
			Trust on KS					Total
			S. Disagree	Disagree	Neutral	Agree	S. Agree	
Gender	Male	Count	4	11	38	63	14	130
		% within Gender	3.1%	8.5%	29.2%	48.5%	10.8%	100.0%
		% within Trust	80.0%	55.0%	79.2%	68.5%	70.0%	70.3%
		% of Total	2.2%	5.9%	20.5%	34.1%	7.6%	70.3%
	Female	Count	1	9	10	29	6	55
		% within Gender	1.8%	16.4%	18.2%	52.7%	10.9%	100.0%
		% within Trust	20.0%	45.0%	20.8%	31.5%	30.0%	29.7%
		% of Total	0.5%	4.9%	5.4%	15.7%	3.2%	29.7%
Total		Count	5	20	48	92	20	185
		% within Gender	2.7%	10.8%	25.9%	49.7%	10.8%	100.0%
		% within Trust	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	2.7%	10.8%	25.9%	49.7%	10.8%	100.0%

- **The Awareness of respondents about KS Across Age Group**

Within age group of 23-28 and 29-34, 78.6% of the respondents have awareness about KS each (Table 4.37). In the case of the group 35-40 and 41-46, 72.2% and 85.7% of the participants have KS awareness respectively. Similarly, 81.3% and 92.9% of the respondents within the 47-52 and greater than 52 age group respondents have awareness about KS in their order (Table 4.37). The smallest number of (4.3%) employees who are not aware of KS is from age group 42-52 while the greater (22.2%) participants who are not aware about KS are from 35-40 age group (Table 4.37).

Table 4.37. Cross Tabulation on KS Awareness Across Age Group (n=185)

Age group * I am aware of KS Cross Tabulation								
			Awareness about KS					Total
			S. Disagree	Disagree	Neutral	Agree	S. Agree	
Age group	23-28	Count	1	2	6	21	12	42
		% within Age group	2.4%	4.8%	14.3%	50.0%	28.6%	100.0%
		% within Awareness	25.0%	12.5%	37.5%	23.6%	20.0%	22.7%
		% of Total	0.5%	1.1%	3.2%	11.4%	6.5%	22.7%
	29-34	Count	0	6	6	31	13	56
		% within Age group	0.0%	10.7%	10.7%	55.4%	23.2%	100.0%
		% within Awareness	0.0%	37.5%	37.5%	34.8%	21.7%	30.3%
		% of Total	0.0%	3.2%	3.2%	16.8%	7.0%	30.3%
	35-40	Count	3	5	2	13	13	36
		% within Age group	8.3%	13.9%	5.6%	36.1%	36.1%	100.0%
		% within Awareness	75.0%	31.2%	12.5%	14.6%	21.7%	19.5%
		% of Total	1.6%	2.7%	1.1%	7.0%	7.0%	19.5%
	41-46	Count	0	1	1	5	7	14
		% within Age group	0.0%	7.1%	7.1%	35.7%	50.0%	100.0%
		% within Awareness	0.0%	6.2%	6.2%	5.6%	11.7%	7.6%
		% of Total	0.0%	0.5%	0.5%	2.7%	3.8%	7.6%
	47-52	Count	0	1	1	13	8	23
		% within Age group	0.0%	4.3%	4.3%	56.5%	34.8%	100.0%
		% within Awareness	0.0%	6.2%	6.2%	14.6%	13.3%	12.4%
		% of Total	0.0%	0.5%	0.5%	7.0%	4.3%	12.4%
	>52	Count	0	1	0	6	7	14
		% within Age group	0.0%	7.1%	0.0%	42.9%	50.0%	100.0%
		% within Awareness	0.0%	6.2%	0.0%	6.7%	11.7%	7.6%
		% of Total	0.0%	0.5%	0.0%	3.2%	3.8%	7.6%
Total		Count	4	16	16	89	60	185
		% within Age group	2.2%	8.6%	8.6%	48.1%	32.4%	100.0%
		% within Awareness	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	2.2%	8.6%	8.6%	48.1%	32.4%	100.0%

- **Employees' Trust on KS Across Age Group**

About 59.5% of the respondents within 23-28 age group have trust on KS while 11.9% of the same age group do not (Table 4.38). In the case of 29-34 age group, 55.3% of the participants confirm that they have trust on KS. On the contrary, 17.9% do not have within the same age group. 63.9% and 71.4% of the Employees within 35-40 and 41-46 age group have trust on KS respectively (Table 4.38). Of these age group, 11.1% and 7.1% of the respondents do not have trust on KS in their order. 60.8% of participants from age group 47-52 assert that the trust they have on KS and 21.7% of the same age group do not have which is the larger percent comparing to others. Finally, 64.2% of the respondents have trust on KS but there are no (0%) individuals who do not have trust on KS from the same age group (Table 4.38).

Table 4.38. Cross Tabulation for Trust on KS Across Age Group (n=185)

Age group * Trust on KS Cross Tabulation								
			Trust on KS					Total
			S. Disagree	Disagree	Neutral	Agree	S. Agree	
Age group	23-28	Count	1	4	12	20	5	42
		% within Age group	2.4%	9.5%	28.6%	47.6%	11.9%	100.0%
		% within Trust	20.0%	20.0%	25.0%	21.7%	25.0%	22.7%
		% of Total	0.5%	2.2%	6.5%	10.8%	2.7%	22.7%
	29-34	Count	3	7	15	26	5	56
		% within Age group	5.4%	12.5%	26.8%	46.4%	8.9%	100.0%
		% within Trust	60.0%	35.0%	31.2%	28.3%	25.0%	30.3%
		% of Total	1.6%	3.8%	8.1%	14.1%	2.7%	30.3%
	35-40	Count	1	3	9	20	3	36
		% within Age group	2.8%	8.3%	25.0%	55.6%	8.3%	100.0%
		% within Trust	20.0%	15.0%	18.8%	21.7%	15.0%	19.5%
		% of Total	0.5%	1.6%	4.9%	10.8%	1.6%	19.5%
	41-46	Count	0	1	3	7	3	14
		% within Age group	0.0%	7.1%	21.4%	50.0%	21.4%	100.0%
		% within Trust	0.0%	5.0%	6.2%	7.6%	15.0%	7.6%
		% of Total	0.0%	0.5%	1.6%	3.8%	1.6%	7.6%
	47-52	Count	0	5	4	11	3	23
		% within Age group	0.0%	21.7%	17.4%	47.8%	13.0%	100.0%
		% within Trust	0.0%	25.0%	8.3%	12.0%	15.0%	12.4%
		% of Total	0.0%	2.7%	2.2%	5.9%	1.6%	12.4%
	>52	Count	0	0	5	8	1	14
		% within Age group	0.0%	0.0%	35.7%	57.1%	7.1%	100.0%
		% within Trust	0.0%	0.0%	10.4%	8.7%	5.0%	7.6%
		% of Total	0.0%	0.0%	2.7%	4.3%	0.5%	7.6%
Total		Count	5	20	48	92	20	185
		% within Age group	2.7%	10.8%	25.9%	49.7%	10.8%	100.0%
		% within Trust	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	2.7%	10.8%	25.9%	49.7%	10.8%	100.0%

- **The Awareness of respondents about KS Across Education Level**

About 79.1% of Employees participated in this study who have first degree are aware of KS within education level while 11.8% of the same education level holders do not have (Table 4.39). In the same fashion, 90.3% of graduate respondents have KS awareness but 3.2% of this educational group do not have awareness about KS. The overall result shows that 80.5% of the first degree holders and graduates are aware about KS (Table 4.39).

Table 4.39. Cross Tabulation on KS Awareness Across Education Level (n=185)

Educational level * I am aware of KS Cross Tabulation								
			Awareness about KS					Total
			S. Disagree	Disagree	Neutral	Agree	S. Agree	
Education level	First Degree	Count	3	15	14	76	45	153
		% within Education	2.0%	9.8%	9.2%	49.7%	29.4%	100.0%
		% within Awareness	75.0%	93.8%	87.5%	85.4%	75.0%	82.7%
		% of Total	1.6%	8.1%	7.6%	41.1%	24.3%	82.7%
	Graduate	Count	1	0	2	13	15	31
		% within Education	3.2%	0.0%	6.5%	41.9%	48.4%	100.0%
		% within Awareness	25.0%	0.0%	12.5%	14.6%	25.0%	16.8%
		% of Total	0.5%	0.0%	1.1%	7.0%	8.1%	16.8%
	Doctoral	Count	0	1	0	0	0	1
		% within Education	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
		% within Awareness	0.0%	6.2%	0.0%	0.0%	0.0%	0.5%
		% of Total	0.0%	0.5%	0.0%	0.0%	0.0%	0.5%
Total		Count	4	16	16	89	60	185
		% within Education	2.2%	8.6%	8.6%	48.1%	32.4%	100.0%
		% within Awareness	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	2.2%	8.6%	8.6%	48.1%	32.4%	100.0%

- **Employees' Trust about KS Across Education Level**

Within first degree education level, about 60.5% of individuals participated in this study have trust on KS. In a similar education level, 14.4% of the respondents do not have trust on KS (Table 4.40). 71.3% of employees with second degree have trust on KS but 9.7% of the respondents from the same educational group do not have trust on KS (Table 4.40).

Table 4.40. Cross Tabulation for Trust on KS Across Education Level (n=185)

Educational level * Trust on KS Cross Tabulation								
			Trust on KS					Total
			S. Disagree	Disagree	Neutral	Agree	S. Agree	
Education level	First Degree	Count	5	17	38	77	16	153
		% within Education	3.3%	11.1%	24.8%	50.3%	10.5%	100.0%
		% within Trust	100.0%	85.0%	79.2%	83.7%	80.0%	82.7%
		% of Total	2.7%	9.2%	20.5%	41.6%	8.6%	82.7%
	Graduate	Count	0	3	9	15	4	31
		% within Education	0.0%	9.7%	29.0%	48.4%	12.9%	100.0%
		% within Trust	0.0%	15.0%	18.8%	16.3%	20.0%	16.8%
		% of Total	0.0%	1.6%	4.9%	8.1%	2.2%	16.8%
	Doctoral	Count	0	0	1	0	0	1
		% within Education	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
		% within Trust	0.0%	0.0%	2.1%	0.0%	0.0%	0.5%
		% of Total	0.0%	0.0%	0.5%	0.0%	0.0%	0.5%
Total		Count	5	20	48	92	20	185
		% within Education	2.7%	10.8%	25.9%	49.7%	10.8%	100.0%
		% within Trust	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	2.7%	10.8%	25.9%	49.7%	10.8%	100.0%

4.3. Bivariate and Multivariate Analysis

4.3.1. Overview

In this sub-section, Bivariate and Multivariate analysis results are presented and discussed. Under Bivariate analysis, thirteen alternative hypotheses testing made to check the association and its degree of significance between KS factors and KS practice. The alternative hypotheses grouped in to NOK, Individual, Organizational and ICT factors. Then, the items enumerated under each KS factors have been computed (transformed) in to one mean score variable using the SPSS to surface the Bivariate analysis process. Moreover, the KS practice items were grouped in to two categories: organizational and Employees KS factors to carry out the Multivariate analysis activity. Finally, the qualitative data clustered thematically in to seven areas and analyzed to enrich or supplement the quantitative findings and presented in text.

4.3.*2*. Bivariate Analysis

This data analysis covered hypotheses testing using Pearson's correlation coefficient and Spearman's correlation coefficient against the Null Hypothesis ($\mathbf{H_0}$) value of the population. This is processed between the dependent variable, knowledge sharing, and the independent variables of KS dimensions: Individuals, Organizational, Technological and NOK to test the presence of relationship between the two groups of variables. However, correlation coefficients do not give information about whether one variable moves in response to another. Therefore, there is no attempt to set up one variable as "dependent" and the other as "independent". Any relationship or association between two variables should be assessed not only just for the strength and direction [as given by the correlation coefficients r or ρ], but also by whether the relationship is "significant" [given by the p value]. Hence testing for significance answers the question "how reliable is the correlation analysis?" (Gogtay & Thatte, 2017).

The Pearson's correlation coefficient is a statistical measure of the strength of a linear relationship between paired data. In a sample, it is denoted by r and is by design constrained as follows.

- Positive values denote positive linear correlation;
- Negative values denote negative linear correlation;
- A value of 0 denotes no linear correlation;

- The closer the value is to 1 or –1, the stronger the linear correlation.

When r= _+1, that depicts perfect correlation with the points being in a perfect straight line. Therefore, since correlation is an effect size and it can verbally describe the strength of the correlation using the guide that Evans (1996) suggests for the absolute value of r:

- .00 -.19 “very weak”
- .20 -.39 “weak”
- .40 -.59 “moderate”
- .60 -.79 “strong”
- .80 -1.0 “very strong”

The calculation of Pearson’s correlation coefficient and subsequent significance testing has its own data assumptions to hold. According to Gogtay & Thatte (2017), the Pearson’s correlation coefficient establishes a relationship between the two variables based on three assumptions. These are-

- The Relationship must be linear
- The variables should be measured at interval or ratio level
- There should be approximately normally distributed

The Pearson r is useful for assessing the degree to which scores on two different variables have a linear relationship. The coefficient of determination (r2) is simply the squared correlation coefficient. Reporting the coefficient of determination is valuable for two reasons. First, this value represents the percentage of explained variance between two variables, and this is easily understood by most people. Second, the coefficient of determination is also a very important statistical value, or one measure of *effect size* (Beins & McCarthy, 2012). The Publication Manual of the American Psychological Association (2010) guidelines now suggests that every study should report effect sizes, or the magnitude of an effect. The coefficient of determination is just one measure of effect size and it is most appropriate when using a correlational technique (Beins & McCarthy, 2012).

In order to pave the road to analysis, the Likert items transformed or computed in to mean score values using SPSS. Then, a Likert scale variable realized and made ready for statistical analysis. Generally, a total of 46 Likert items transformed in to 16 separate Likert scale variables.

Under KS dimensions, there are thirteen Likert scale variables for this analysis to test the hypotheses (premises) and Likert scale variables in KS practice. Practically Pearson's correlation coefficient is sensitive to skewed distributions and outliers. So, before heading to correlation analysis process, the normality of the corresponding variables has been checked using Skewness, Kurtosis and Shapiro-Wilk test of normality. Of the thirteen KS factors, six variables are approximately normally distributed with KS practice variable and the other seven do not have normality with it. Then, correspondingly six Pearson's correlation analysis performed and seven correlational analysis handled using Spearman's correlation method.

4.3.2.1. Nature of Knowledge

Testing of H_1

H_1: The more complex and tacit the knowledge, the less the knowledge shared and acquired by the client.

Define Null and Alternative Hypotheses:

H_0; p >0, the relationship between NOK and KS practice is Positive.

H_1; p <0, the relationship between NOK and KS practice is Negative.

The Pearson correlation coefficient value (r) 0.180 confirms the presence of apparent or superficial positive correlation between the two variables (Table 4.41). Therefore, it is realized that there is a statistically significant (*weakly positive*) relationship between NOK and KS practice. Subsequently, the H_1 is rejected and the null hypothesis is accepted at the 0.01 one-tailed significance level since the Pearson's Coefficient 'r' value is positive. Formally, there is a significant weak positive correlation between NOK and KS practice, r (183) =0.18, p=0.007 (Table 4.41).

Therefore, the p-value (0.007) is less than the significance level value alpha (α= 0.01), which signifies that there is very strong evidence to believe the NOK (complexity and tacitness) positively influences the knowledge sharing practices in EEU. Moreover, the coefficient of determination (r^2= 0.032) implies that 3.2% variation or effect in KS practice is explained by NOK (Table 4.41). In conclusion, the NOK in EEU is not too much complex and sticky to be shared verbally or to be coded in useful and usable form.

Table 4.41. Pearson's Correlation between NOK and KS Practice

Pearson's Correlation			
		NOK	KS Practice
NOK	Pearson Correlation	1	.180**
	Sig. (1-tailed)		.007
	N	185	185
KS Practice	Pearson Correlation	.180**	1
	Sig. (1-tailed)	.007	
	N	185	185
**. Correlation is significant at the 0.01 level (1-tailed).			

4.3.2.2. Individual Factors

Individual factors have significant impact on knowledge sharing behavior in Organisation (Ismail & Yusof, 2010). Therefore, it is also the objective of this study to investigate the relationship between individual factors such as awareness, trust, personality and job satisfaction on KS practice variation in EEU.

Testing of H_2

H_2: Awareness of the importance of knowledge sharing is positively related to knowledge sharing practice.

Define Null and Alternative Hypotheses:

H_0; p<0, the relationship between Awareness and KS practice is Negative.

H_2; p >0, the relationship between Awareness and KS practice is Positive.

The Spearman's correlation coefficient value (r_s) -0.082 shows that the presence of superficial negative correlation between the two variables (Table 4.42). That is, it is realized that there is a statistically significant (very weak negative) relationship between Awareness and KS practice. Therefore, the H2 is rejected and the null hypothesis is accepted at the 0.01 one-tailed significance level since the Spearman's Coefficient 'rho' value is negative. Formally, there is a significant very weak negative correlation between Awareness and KS practice, r (183) = -0.08, p=0.133 (Table 4.42). However, the p-value (0.133) is greater than the significance level value alpha (α= 0.01), which signifies that the absence of evidence to believe the negative association between employees' awareness about KS and KS practice.

Moreover, the coefficient of determination (r^2= 0.007) which implies that 0.7% variation or effect in KS practice is explained by employees' awareness (Table 4.42). In conclusion, statistically there is no sufficient evidence to suggest even the existence of relationship at all between awareness and KS practice at this point.

Table 4.42. Spearman's rho Correlation between Awareness and KS Practice

Spearman's Correlations				
			KS Practice	KS Awareness
Spearman's rho	KS Practice	Correlation Coefficient	1.000	-.082
		Sig. (1-tailed)	.	.133
		N	185	185
	KS Awareness	Correlation Coefficient	-.082	1.000
		Sig. (1-tailed)	.133	.
		N	185	185

Testing of H_3

H_3: Trust is positively related to knowledge sharing practice.

Define Null and Alternative Hypotheses:

H_0; p<0, the relationship between Trust and KS practice is Negative.

H_2; p >0, the relationship between Trust and KS practice is Positive.

The Pearson correlation coefficient value (r) 0.190 describes that incidence of seeming positive correlation between the two variables (Table 4.43). Therefore, it is realized that there is a statistically significant (*weakly positive*) relationship between Trust and KS practice. Consequently, the null hypothesis is rejected and the **H_3** is accepted at the 0.01 one-tailed significance level since the Pearson's Coefficient 'r' value is positive. Formally, there is a significant weak positive correlation between Trust and KS practice, r (183) =0.19, p=0.005 (Table 4.43). Moreover, the p-value (0.005) is less than the significance level value alpha (α= 0.01), which signifies that there is very strong evidence to believe that employees' trust positively influences the knowledge sharing practices in EEU. Furthermore, the coefficient of determination (r^2= 0.036) implies that 3.6% variation or effect in KS practice is explained by Trust (Table 4.43). In conclusion, the trust among employees in EEU about KS practice has statistically a positive relationship.

Table 4.43. Pearson's Correlation between Trust and KS Practice

Pearson 's Correlations			
		KS Practice	Trust on KS
KS Practice	Pearson Correlation	1	.190**
	Sig. (1-tailed)		.005
	N	185	185
Trust on KS	Pearson Correlation	.190**	1
	Sig. (1-tailed)	.005	
	N	185	185
**. Correlation is significant at the 0.01 level (1-tailed).			

Testing of H4

H4: Personality is positively related to knowledge sharing practice.

Define Null and Alternative Hypotheses:

H_0; p<0, the relationship between Personality and KS practice is Negative.

H_4; p >0, the relationship between Personality and KS practice is Positive.

The Spearman's correlation coefficient value (rs) -0.027 indicates the presence of superficial negative correlation between the two variables (Table 4.44). That is, it is realized that there is a statistically significant (very weak negative) relationship between Personality and KS practice. Therefore, the H4 is rejected and the null hypothesis is accepted at the 0.01 one-tailed significance level since the Spearman's Coefficient 'rho' value is negative. Formally, there is a significant very weak negative correlation between Personality and KS practice, r (183) = -0.03, p=0.359 (Table 4.44). However, the p-value (0.359) is greater than the significance level value alpha (α= 0.01) that signifies the absence of evidence to believe the negative association between employees' Personality about KS and KS practice (Table 4.44). Moreover, the coefficient of determination of r2= 0.001 implies that 0.1% variation in KS practice is explained by employees' personality (Table 4.44). In conclusion, statistically there is no enough evidence to suggest even the existence of relationship between employees' personality and KS practice.

Table 4.44. Spearman's rho Correlation between Personality and KS Practice

Spearman's Correlations				
			KS Practice	Personality towards KS
Spearman's rho	KS Practice	Correlation Coefficient	1.000	-.027
		Sig. (1-tailed)	.	.359
		N	185	185
	Personality towards KS	Correlation Coefficient	-.027	1.000
		Sig. (1-tailed)	.359	.
		N	185	185

Testing of H5

H_5: Job satisfaction is positively related to knowledge sharing practice.

Define Null and Alternative Hypotheses:

H_0; p<0, the relationship between Job satisfaction and KS practice is Negative.

H_5; p >0, the relationship between Job satisfaction and KS practice is Positive.

The Spearman's correlation coefficient value (r_s) 0.380 shows the incidence of seeming positive correlation between the two variables (Table 4.45). Therefore, it is realized that there is a statistically significant (*weakly positive*) relationship between Job Satisfaction and KS practice. Consequently, the null hypothesis is rejected and the H_5 is accepted at the 0.01 one-tailed significance level since the Spearman's Coefficient 'rho' value is positive. Correctly, there is a significant weak positive correlation between Job Satisfaction and KS practice, r_s (183) =0.38, p=0.000 (Table 4.45). Moreover, the p-value (0.000) is less than the significance level value alpha (α= 0.01), which signifies that there is a very strong evidence to believe that Job Satisfaction positively influences the knowledge sharing practices in EEU. Furthermore, the coefficient of determination (r^2= 0.144) implies that 14.4% variation or effect in KS practice is explained by Job Satisfaction (Table 4.45). In conclusion, statistically Job Satisfaction and KS practice have a positive relationship in EEU context. Refining

Table 4.45. Spearman's rho Correlation between Job satisfaction and KS Practice

Spearman's Correlations				
			KS Practice	Job Satisfaction
Spearman's rho	KS Practice	Correlation Coefficient	1.000	.380**
		Sig. (1-tailed)	.	.000
		N	185	185
	Job Satisfaction	Correlation Coefficient	.380**	1.000
		Sig. (1-tailed)	.000	.
		N	185	185
**. Correlation is significant at the 0.01 level (1-tailed).				

4.3.2.3. Organizational Factors

Testing of H6

H_6: Organizational structure is positively related to knowledge sharing practice.

Define Null and Alternative Hypotheses:

H_0; p<0, the relationship between Organizational structure and KS practice is Negative.

H_6; p >0, the relationship between Organizational structure and KS practice is Positive.

The Pearson correlation coefficient value (r) 0.324 describes the occurrence of seeming positive correlation between the two variables (Table 4.46). Therefore, it is realized that there is a statistically significant (weakly positive) relationship between Organizational structure and KS practice. Consequently, the null hypothesis is rejected and the H6 is accepted at the 0.01 one-tailed significance level since the Pearson's Coefficient 'r' value is positive. Formally, there is a significant weak positive correlation between Organizational structure and KS practice, r (183) =0.32, p=0.000 (Table 4.46). Moreover, the p-value (0.000) is less than the significance level value alpha (α= 0.01), which indicates that there is a very strong evidence to believe that Organizational structure positively influences the knowledge sharing practices in EEU. Furthermore, the coefficient of determination (r2= 0.105) implies that 10.5% variation or effect in KS practice is explained by Organizational structure (Table 4.46). In conclusion, the Organizational structure and KS practice have statistically a positive relationship according to this research findings.

Table 4.46. Pearson's Correlation between Organizational structure and KS Practice

Pearson's Correlations			
		KS Practice	Organizational Structure
KS Practice	Pearson Correlation	1	.324**
	Sig. (1-tailed)		.000
	N	185	185
Organizational Structure	Pearson Correlation	.324**	1
	Sig. (1-tailed)	.000	
	N	185	185
**. Correlation is significant at the 0.01 level (1-tailed).			

Testing of H_7

H_7: Organizational Culture is positively related to knowledge sharing practice.

Define Null and Alternative Hypotheses:

H_0; p<0, the relationship between Organizational Culture and KS practice is Negative.

H_7; p >0, the relationship between Organizational Culture and KS practice is Positive.

The Pearson correlation coefficient value (r) 0.551 illustrates the presence of apparent positive correlation between the two variables (Table 4.47). Therefore, it is understood that there is a statistically significant (*moderately positive*) relationship between Organizational Culture and KS practice. Consequently, the null hypothesis is rejected and the H_7 is accepted at the 0.01 one-tailed significance level since the Pearson's Coefficient 'r' value is positive. Apparently, there is a significant moderate positive correlation between Organizational Culture and KS practice, r (183) =0.55, p=0.000 (Table 4.47). Moreover, the p-value (0.000) is less than the significance level value alpha (α= 0.01), which indicates that there is a very strong evidence to believe that Organizational Culture positively stimulates the knowledge sharing practices in EEU. Furthermore, the coefficient of determination (r^2= 0.304) implies that 30.4% variation or effect in KS practice is explained by Organizational Culture (Table 4.47). Therefore, Organizational Culture and KS practice have statistically positive association in this study.

Table 4.47. Pearson's Correlation between Organizational Culture and KS Practice

Pearson 's Correlations			
		KS Practice	Organizational Culture
KS Practice	Pearson Correlation	1	.551**
	Sig. (1-tailed)		.000
	N	185	185
Organizational Culture	Pearson Correlation	.551**	1
	Sig. (1-tailed)	.000	
	N	185	185
**. Correlation is significant at the 0.01 level (1-tailed).			

Testing of H_8

H_8: Rewards and recognitions are positively related to knowledge sharing practice.

Define Null and Alternative Hypotheses:

H_0; p<0, the relationship between Rewards and Recognitions and KS practice is Negative.
H_8; p >0, the relationship between Rewards and Recognitions and KS practice is Positive.

The Pearson correlation coefficient value (r) 0.553 confirms that the presence of superficial positive correlation between the two variables (Table 4.48). Therefore, it is accepted that there is a statistically significant (*moderately positive*) relationship between Rewards and Recognitions and KS practice. Consequently, the null hypothesis is rejected and the **H_8** is accepted at the 0.01 one-tailed significance level since the Pearson's Coefficient 'r' value is positive. Formally, there is a significant moderate positive correlation between Rewards and Recognitions and KS practice, r (183) =0.55, p=0.000 (Table 4.48).

Moreover, the p-value (0.000) is less than the significance level value alpha (α= 0.01), which indicates that there is a very strong evidence to believe that Rewards and Recognitions positively stimulates the knowledge sharing practices in EEU. Furthermore, the coefficient of determination (r^2= 0.306) implies that 30.6% variation or effect in KS practice is explained by Rewards and Recognitions (Table 4.48). In conclusion, the Rewards and Recognitions in EEU practice statistically have a positive association with KS practice.

Table 4.48. Pearson's Correlation between Rewards and Recognitions and KS Practice

Pearson's Correlations			
		KS Practice	Rewards and Recognitions
KS Practice	Pearson Correlation	1	.553**
	Sig. (1-tailed)		.000
	N	185	185
Rewards and Recognitions	Pearson Correlation	.553**	1
	Sig. (1-tailed)	.000	
	N	185	185
**. Correlation is significant at the 0.01 level (1-tailed).			

Testing of H_9

H_9: Office Layout is positively related to knowledge sharing practice.

Define Null and Alternative Hypotheses:

H_0; p<0, the relationship between Office Layout and KS practice is Negative.

H_9; p >0, the relationship between Office Layout and KS practice is Positive.

The Pearson's correlation coefficient value (r) 0.041 indicates as viewed from the Table 4.49 below, the existence of shallow positive correlation between the two variables. Therefore, it is accepted that there is a statistically significant (*very weak positive*) relationship between Office Layout and KS practice. Again, the null hypothesis is rejected and the H9 is accepted at the 0.01 one-tailed significance level since the Pearson's Coefficient 'r' value is positive. Formally, there is a significant very weak positive correlation between Office Layout and KS practice, r (183) =0.04, p=0.290 (Table 4.49). Moreover, the p-value (0.290) is greater than the significance level value alpha (α= 0.01), which indicates that there is no evidence to believe the positive association between Office Layout and KS practice.

Moreover, the coefficient of determination (r^2= 0.002) implies that 0.02% variation in KS practice is explained by Office Layout which is statistically insignificant (Table 4.49). In conclusion, statistically there is no enough evidence to suggest the existence of relationship between Office Layout and KS practice at this level in EEU.

Table 4.49. Pearson's Correlation between Office Layout and KS Practice

Pearson Correlations			
		KS Practice	Office Layout
KS Practice	Pearson Correlation	1	.041
	Sig. (1-tailed)		.290
	N	185	185
Office Layout	Pearson Correlation	.041	1
	Sig. (1-tailed)	.290	
	N	185	185

Testing of H10

H9: Work Process is positively related to knowledge sharing practice.

Define Null and Alternative Hypotheses:

H_0; p<0, the relationship between Work Process and KS practice is Negative.

H_9; p >0, the relationship between Work Process and KS practice is Positive.

The Pearson correlation coefficient value (r) 0.397 shows the occurrence of apparent positive correlation between the two variables (Table 4.50). Therefore, it is understood that there is a statistically significant (*moderately positive*) relationship between Work Process and KS practice. Consequently, the null hypothesis is rejected and the **H_{10}** is accepted at the 0.01 one-tailed significance level since the Pearson's Coefficient 'r' value is positive. Formally, there is a significant moderate positive correlation between Work Process and KS practice, r (183) =0.40, p=0.000. Moreover, the p-value (0.000) is less than the significance level value alpha (α= 0.01), which indicates that there is a very strong evidence to believe that Work Process positively stimulates the knowledge sharing practices in EEU. Furthermore, the coefficient of determination (r^2= 0.158) implies that 15.8% variation or effect in KS practice is explained by Work Process (Table 4.50). In conclusion, the Work Process in EEU practice is statistically associated with KS practice positively.

Table 4.50. Pearson's Correlation between Work Process and KS Practice

Pearson's Correlations			
		KS Practice	Work Process
KS Practice	Pearson Correlation	1	.397**
	Sig. (1-tailed)		.000
	N	185	185
Work Process	Pearson Correlation	.397**	1
	Sig. (1-tailed)	.000	
	N	185	185
**. Correlation is significant at the 0.01 level (1-tailed).			

4.3.2.4. ICT Factors

Testing of H_{11}

H_{11}: ICT infrastructure is positively related to knowledge sharing practice.

Define Null and Alternative Hypotheses:

H_0; p<0, the relationship between ICT Infrastructure and KS practice is Negative.

H_{11}; p >0, the relationship between ICT Infrastructure and KS practice is Positive.

The Spearman correlation coefficient value (rs) 0.449 shows, as observed from the Table 4.51 above, the occurrence of apparent positive correlation between the two variables. Therefore, it is understood that there is a statistically significant (moderately positive) relationship between ICT Infrastructure and KS practice. As a result, the null hypothesis is rejected and the H11 is accepted at the 0.01 one-tailed significance level since the Spearman's Coefficient 'rho' value is positive. Formally, there is a significant moderate positive correlation between ICT Infrastructure and KS practice, rs (183) =0.45, p=0.000 (Table 4.51).

Moreover, the p-value (0.000) is less than the significance level value alpha (α= 0.01), which indicates that there is a very strong evidence to believe that ICT Infrastructure positively stimulates the knowledge sharing practices in EEU. Furthermore, the coefficient of determination (r2= 0.202) implies that 20.2% variation in KS practice is explained by ICT Infrastructure (Table 4.51). In conclusion, the ICT Infrastructure in EEU practice is statistically a positively association with KS practice.

Table 4.51. Spearman's Correlation between ICT Infrastructure and KS Practice

Spearman's Correlations				
			KS Practice	ICT Infrastructure for KS
Spearman's rho	KS Practice	Correlation Coefficient	1.000	.449**
		Sig. (1-tailed)	.	.000
		N	185	185
	ICT Infrastructure for KS	Correlation Coefficient	.449**	1.000
		Sig. (1-tailed)	.000	.
		N	185	185
**. Correlation is significant at the 0.01 level (1-tailed).				

Testing of H_{12}

H_{12}: ICT know-How is positively related to knowledge sharing practice

Define Null and Alternative Hypotheses:

H_0; p<0, the relationship between ICT know-How and KS practice is Negative.

H_{12}; p >0, the relationship between ICT know-How and KS practice is Positive.

The Spearman's correlation coefficient value (r_s) 0.608 indicates, as observed from the Table 4.52 below, the incidence of positive correlation between the two variables. Therefore, it is recognized that a statistically significant (moderately positive) relationship between ICT Know-How and KS practice exists. As a result, the null hypothesis is rejected and the H12 is accepted at the 0.01 one-tailed significance level since the Spearman's Coefficient 'rho' value is positive. Thus, there is a significant moderate positive correlation between ICT Know-How and KS practice, rs (183) =0.61, p=0.000 (Table 4.52). Moreover, the p-value (0.000) is less than the significance level value alpha (α= 0.01), which denotes that there is a very strong evidence to believe that ICT Know-How positively influences the knowledge sharing practices in EEU. Furthermore, the coefficient of determination (r2= 0.370) implies that 37.0% variation in KS practice is explained by ICT know-How (Table 4.52). In conclusion, the ICT Know-How in EEU is statistically correlated with KS practice at EEU positively.

Table 4.52. Spearman's Correlation between ICT know-How and KS Practice

Spearman's Correlations				
			KS Practice	ICT Know-How
Spearman's rho	KS Practice	Correlation Coefficient	1.000	.608**
		Sig. (1-tailed)	.	.000
		N	185	185
	ICT Know-How	Correlation Coefficient	.608**	1.000
		Sig. (1-tailed)	.000	.
		N	185	185
**. Correlation is significant at the 0.01 level (1-tailed).				

Testing of H_{13}

H_{13}: ICT tools Type is positively related to knowledge sharing practice.

Define Null and Alternative Hypotheses:

H_0; $p<0$, the relationship between ICT Tools Type and KS practice is Negative.

H_{13}; $p>0$, the relationship between ICT Tools Type and KS practice is Positive.

As illustrated on Table 4.53, the Spearman's correlation coefficient value (r_s) 0.600 confirms the existence of positive correlation between the two variables. Therefore, it is accepted that there is a statistically significant (*moderately positive*) relationship between ICT Tools Type and KS practice. Consequently, the null hypothesis is rejected and the H_{13} is accepted at the 0.01 one-tailed significance level since the Spearman's Coefficient 'rho' value is positive. Thus, there is a significant moderate positive correlation between ICT Tools Type and KS practice, r_s (183) =0.60, p=0.000 (Table 4.53). Moreover, the p-value (0.000) is less than the significance level value alpha (α= 0.01) which denotes that there is a very strong evidence to believe that ICT Tools Type positively influences the knowledge sharing practices in EEU. Furthermore, the coefficient of determination (r^2= 0.360) implies that 36.0% variation in KS practice is explained by ICT Tools Type (Table 4.53). In conclusion, statistically the ICT Tools Type is positively correlated with KS practice in EEU.

Table 4.53. Spearman's Correlation between ICT Tools Type and KS Practice

Spearman's Correlations				
			KS Practice	ICT tools type for KS
Spearman's rho	KS Practice perspective	Correlation Coefficient	1.000	.600**
		Sig. (1-tailed)	.	.000
		N	185	185
	ICT tools type for KS	Correlation Coefficient	.600**	1.000
		Sig. (1-tailed)	.000	.
		N	185	185
**. Correlation is significant at the 0.01 level (1-tailed).				

The hypothesis testing results and the significance level of KS factors on KS practice are summarized in the following Table 4.54. Of the thirteen hypotheses, ten were accepted and three were rejected. In the case of significance level, ten KS factors have a significance influence on KS practice and the other three do not have (Table 4.54).

Table 4.54. Hypotheses Testing Results and Significance Level Summary

S. No	Hypotheses	Significance Level		Verification	
		Sig.	Not Sig	Accepted	Rejected
1	NOK has Negative Association with KS	✓			✓
2	Awareness has Positive Association with KS		✓		✓
3	Trust has Positive Association with KS	✓		✓	
4	Personality has Positive Association with KS		✓		✓
5	Job Satisfaction has Positive Association with KS	✓		✓	
6	Motivational Scheme has Positive Association with KS	✓		✓	
7	Structure has Positive Association with KS	✓		✓	
8	Culture has Positive Association with KS	✓		✓	
9	Office Layout Infrastructure has Positive Association with KS		✓	✓	
10	Work Process has Positive Association with KS	✓		✓	
11	ICT infrastructure has Positive Association with KS	✓		✓	
12	ICT Know-How has Positive Association with KS	✓		✓	
13	ICT Tool Type has Positive Association with KS	✓		✓	
Total		10	3	10	3

According to Table 4.54 above, there are ten KS factors which have significant correlation with KS practice. Based on this, the interest of each KS factors towards the others is tested using Pearson's Correlations method and discussed below.

The Pearson correlation coefficient values (r) 0.357, (r) 0.176 and (r) 0.431 indicate that Individual factors (Trust and Job Satisfaction) have positive association with ICT factors (Infrastructure, Know-How an ICT tools Type), NOK and Organizational factors (structure, culture, Rewards and Recognitions and Work Process) respectively. The corresponding p-values which are significant at 0.001, 0.05 and 0.001 shows that there is an strong evidence to accept the above association (Table 4.55). ICT factors also have a positive correlation with NOK and organizational factors in a values of (r) 0.219 and (r) 0.494. The p-values for these two factors assert the existence of strong association between them. However, it is evident that there is no association between NOK and organizational (Table 4.55).

Table 4.55. Correlation Analysis between Independent Variables

Pearson's Correlations					
		Individual Factors	ICT Factors	NOK Factors	Organizational Factors
Individual Factors	Pearson Correlation	1	.357**	.176*	.431**
	Sig. (2-tailed)		.000	.017	.000
	N	185	185	185	185
ICT Factors	Pearson Correlation	.357**	1	.219**	.494**
	Sig. (2-tailed)	.000		.003	.000
	N	185	185	185	185
NOK Factors	Pearson Correlation	.176*	.219**	1	.092
	Sig. (2-tailed)	.017	.003		.214
	N	185	185	185	185
Organizational Factors	Pearson Correlation	.431**	.494**	.092	1
	Sig. (2-tailed)	.000	.000	.214	
	N	185	185	185	185
**. Correlation is significant at the 0.01 level (2-tailed).					
*. Correlation is significant at the 0.05 level (2-tailed).					

4.3.*3*. Multivariate Analysis

Multivariate analysis is the process of examining the effects of one or more independent variables on two or more outcome variables simultaneously to have more sophisticated view of the reality (Saccentiet al., 2013). In doing this, five Likert items from individual dimension (Trust and Job Satisfaction), twelve items from organizational dimension (Organizational Structure, Culture, Rewards and Recognition and Work Process), eight Likert items (ICT Infrastructure for KS, ICT Tools Type and ICT Know-How) and two Likert items (Knowledge Complexity and Tacitness) from ICT and NOK carefully chosen based on the Univariate descriptive and Bivariate correlation analysis results and transformed in to sum scored variables using SPSS.

On the other hand, the dependent variable is comprised of seven Likert items. These Likert items are intended to assess either the organizational KS practice or employees level KS practice (Riege, 2005; Norulkamar & Norulkamar, 2014). In other words, the intention is to investigate the level of impact of each KS dimensions or independent variables about the two dependent variables. Multivariate by its nature requires at least two dependent variables. Consequently, these seven Likert items are grouped in to two dependent variables as organizational KS practice and Employees KS practice. In a similar way, the two dependent variables Likert items summed up to surface the analysis process. Then, each KS dimensions analyzed and presented independently respect to the dependent variables since the analysis method is a one factor MANOVA. Moreover, a separate ANOVA was conducted for each dependent variable, with each ANOVA evaluated at Alpha level of 0.025.

4.3.3.1. Nature of Knowledge Factors

Again, Box's Test of Equality of Covariance Matrices checks the assumption of homogeneity of covariance across the NOK for KS factors using $p<.05$ as a criterion. Therefore, p (.578) $>\alpha$ value (.05), signifying that there are no significant differences between the covariance matrices implies that the assumption is not violated and Wilk's Lambda is an appropriate test to use as significance testing method (Table 4.56).

Table 4.56. Box's Test of Equality of Covariance Matrices for NOK Factors

Box's Test of Equality of Covariance Matrices[a]	
Box's M	20.441
F	.910
df1	21
df2	8713.881
Sig.	.578
Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.	
a. Design: Intercept + NOK	

The result generated using the Wilk's Lambda test at alpha level of .05, it can be seen that the test is significant, Wilk's À=.84, F (16, 350) =2.03, p=.011, Multivariate µ2 = .09 (Table 4.57). This implies that NOK factor has a significant difference in influencing employees KS practice and organizational KS practice. Moreover, the Multivariate µ2 = .09 indicates that 9.0% of Multivariate variance of the dependent variables is explained by the NOK factors (Table 4.57). Therefore, NOK factors can be a predictor of KS practice in the context of EEU even if it has a smaller value for KS variation comparing to others.

Table 4.57. Multivariate Test Result for NOK Factors

Multivariate Tests[a]							
Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.829	423.931[b]	2.000	175.000	.000	.829
	Wilks' Lambda	.171	423.931[b]	2.000	175.000	.000	.829
	Hotelling's Trace	4.845	423.931[b]	2.000	175.000	.000	.829
	Roy's Largest Root	4.845	423.931[b]	2.000	175.000	.000	.829
NOK	Pillai's Trace	.166	1.988	16.000	352.000	.013	.083
	Wilks' Lambda	.838	2.027[b]	16.000	350.000	.011	.085
	Hotelling's Trace	.190	2.065	16.000	348.000	.009	.087
	Roy's Largest Root	.166	3.651[c]	8.000	176.000	.001	.142
a. Design: Intercept + NOK							
b. Exact statistic							
c. The statistic is an upper bound on F that yields a lower bound on the significance level.							

The results illustrated in Table 4.58 indicates that NOK KS factor has a significant potential to influence organizational KS practice, F (8, 176) =3.65, p=.001, partial µ2 =.14 but NOK factor but it does not influence Employees' KS practice, F (8, 176) =1.60, p=.128, partial µ2 =.07 since the p-value (.128) is greater than the Alpha value (.025).

Table 4.58. Tests of Between-Subject Effects due to NOK Factors

Tests of Between-Subjects Effects							
Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Employee Practice	52.667[a]	8	6.583	1.600	.128	.068
	Organization Practice	569.110[b]	8	71.139	3.651	.001	.142
Intercept	Employee Practice	2858.820	1	2858.820	694.585	.000	.798
	Organization Practice	12848.139	1	12848.139	659.335	.000	.789
NOK	Employee Practice	52.667	8	6.583	1.600	.128	.068
	Organization Practice	569.110	8	71.139	3.651	.001	.142
Error	Employee Practice	724.392	176	4.116			
	Organization Practice	3429.625	176	19.487			
Total	Employee Practice	7117.000	185				
	Organization Practice	35446.000	185				
Corrected Total	Employee Practice	777.059	184				
	Organization Practice	3998.735	184				
a. R Squared = .068 (Adjusted R Squared = .025)							
b. R Squared = .142 (Adjusted R Squared = .103)							

4.3.3.2. Individual Factors

Box's Test of Equality of Covariance Matrices checks the assumption of homogeneity of covariance across the individual KS factors using p<.05 as a criterion. Therefore, p (.388) > (.05), indicating that there are no significant differences between the covariance matrices which implies that the assumption is not violated and Wilk's Lambda is an appropriate test to use as significance testing method (Table 4.59).

Table 4.59. Box's Test of Equality of Covariance Matrices for Individual Factors

Box's Test of Equality of Covariance Matrices[a]	
Box's M	30.616
F	1.054
df1	27
df2	11350.796
Sig.	.388
Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.	
a. Design: Intercept + Individual	

The result was generated using the Wilk's Lambda test at an alpha level of .05, it can be seen that the test is significant, Wilk's À=.63, F (30, 336) =2.96, p=.000, Multivariate μ^2 = .21 (Table 4.60). This implies that individual factor has a significant difference in influencing employees KS practice and organizational KS practice. Moreover, the Multivariate μ^2 = .21 indicates that 21% of Multivariate variance of the dependent variables is explained by the individual factors (Table 4.60). Therefore, individual factors can be considered as a predictor of KS practice in the context of EEU.

Table 4.60. Multivariate Test Result for Individual Factors

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.735	232.839[b]	2.000	168.000	.000	.735
	Wilks' Lambda	.265	232.839[b]	2.000	168.000	.000	.735
	Hotelling's Trace	2.772	232.839[b]	2.000	168.000	.000	.735
	Roy's Largest Root	2.772	232.839[b]	2.000	168.000	.000	.735
Individual	Pillai's Trace	.406	2.870	30.000	338.000	.000	.203
	Wilks' Lambda	.626	2.961[b]	30.000	336.000	.000	.209
	Hotelling's Trace	.548	3.050	30.000	334.000	.000	.215
	Roy's Largest Root	.430	4.850[c]	15.000	169.000	.000	.301

a. Design: Intercept + Individual

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

The results indicate that individual KS factor has a significant potential to influence both Employees' KS practice, F (15, 169) =4.39, p=.000, partial µ2 =.28 and organizational KS practice, F (15, 169) =3.60, p=.000, partial µ2 =.24 since the p-value (.000) is less than the Alpha value (.025) (Table 4.61).

Table 4.61. Tests of Between-Subject Effects due to Individual Factors

Tests of Between-Subjects Effects							
Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Employee Practice	217.793[a]	15	14.520	4.388	.000	.280
	Organization Practice	968.283[b]	15	64.552	3.600	.000	.242
Intercept	Employee Practice	1205.609	1	1205.609	364.313	.000	.683
	Organization Practice	6345.797	1	6345.797	353.888	.000	.677
Individual	Employee Practice	217.793	15	14.520	4.388	.000	.280
	Organization Practice	968.283	15	64.552	3.600	.000	.242
Error	Employee Practice	559.266	169	3.309			
	Organization Practice	3030.452	169	17.932			
Total	Employee Practice	7117.000	185				
	Organization Practice	35446.000	185				
Corrected Total	Employee Practice	777.059	184				
	Organization Practice	3998.735	184				
a. R Squared = .280 (Adjusted R Squared = .216)							
b. R Squared = .242 (Adjusted R Squared = .175)							

4.3.3.3. Organizational Factors

Box's Test of Equality of Covariance Matrices checks the assumption of homogeneity of covariance across the organizational KS factors using p<.05 as a criterion. Therefore, p (.505) >α value (.05), indicating that there are no significant differences between the covariance matrices which implies the assumption is not violated and Wilk's Lambda is an appropriate test to use as a significance testing method (Table 4.62).

Table 4.62. Box's Test of Equality of Covariance Matrices for Organizational Factors

Box's Test of Equality of Covariance Matrices[a]	
Box's M	78.757
F	.988
df1	66
df2	4828.888
Sig.	.505
Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.	
a. Design: Intercept + Organizational	

In the same way, the following MANOVA result was generated using the Wilk's Lambda test for organizational factors and KS practice variables. It used an alpha level of .05, it can be seen that the test is significant, Wilk's À=.38, F (64, 322) =2.93, p=.000, Multivariate μ^2 = .38 (Table 4.63). This implies that organizational factor has a significant difference in influencing employees KS practice and organizational KS practice. This implies that there is a significant difference between Organizational Structure, Culture, Rewards and Recognition and Work Process on KS practice specifically knowledge retention and the level of frequency in which employees share knowledge with their colleagues. Moreover, the multivariate μ^2 = .38 indicates that 38.0% of Multivariate variance of the dependent variables is explained by the organizational factors (Table 4.63). Therefore, organizational factors noted above can be a predictor of KS practice in the context of EEU.

Table 4.63. Multivariate Test Result for Organizational Factors

Multivariate Tests[a]							
Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.914	802.600[b]	2.000	151.000	.000	.914
	Wilks' Lambda	.086	802.600[b]	2.000	151.000	.000	.914
	Hotelling's Trace	10.630	802.600[b]	2.000	151.000	.000	.914
	Roy's Largest Root	10.630	802.600[b]	2.000	151.000	.000	.914
Organizational Factors	Pillai's Trace	.724	2.696	64.000	304.000	.000	.362
	Wilks' Lambda	.381	2.925[b]	64.000	302.000	.000	.383
	Hotelling's Trace	1.348	3.160	64.000	300.000	.000	.403
	Roy's Largest Root	1.096	5.207[c]	32.000	152.000	.000	.523
a. Design: Intercept + Organizational							
b. Exact statistic							
c. The statistic is an upper bound on F that yields a lower bound on the significance level.							

The results indicate that individual KS factor has a significant potential to influence both Employees' KS practice, F (32, 152) =2.66, p=.000, partial µ2 =.36 and organizational KS practice, F (32, 152) =5.12, p=.000, partial µ2 =.52 since the p-value (.000) is less than the Alpha value (.025) (Table 4.64).

Table 4.64. Tests of Between-Subject Effects due to Organizational Factors

Tests of Between-Subjects Effects							
Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Employee Practice	278.764[a]	32	8.711	2.657	.000	.359
	Organization Practice	2074.219[b]	32	64.819	5.119	.000	.519
Intercept	Employee Practice	3474.798	1	3474.798	1059.952	.000	.875
	Organization Practice	16679.297	1	16679.297	1317.346	.000	.897
Organizational Factors	Employee Practice	278.764	32	8.711	2.657	.000	.359
	Organization Practice	2074.219	32	64.819	5.119	.000	.519
Error	Employee Practice	498.295	152	3.278			
	Organization Practice	1924.516	152	12.661			
Total	Employee Practice	7117.000	185				
	Organization Practice	35446.000	185				
Corrected Total	Employee Practice	777.059	184				
	Organization Practice	3998.735	184				
a. R Squared = .359 (Adjusted R Squared = .224)							
b. R Squared = .519 (Adjusted R Squared = .417)							

4.3.3.4. Information Communication Technology Factors

Again, Box's Test of Equality of Covariance Matrices checks the assumption of homogeneity of covariance across the ICT infrastructure for KS factors using $p<.05$ as a criterion. Therefore, p (.892) >α value (.05), signifying that there are no significant differences between the covariance matrices which implies that the assumption is not violated and Wilk's Lambda is an appropriate test to use as significance testing method (Table 4.65).

Table 4.65. Box's Test of Equality of Covariance Matrices for ICT Factors

Box's Test of Equality of Covariance Matrices[a]	
Box's M	56.254
F	.780
df1	60
df2	3504.462
Sig.	.892
Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.	
a. Design: Intercept + ICT	

The result was generated using the Wilk's Lambda test using an alpha level of .05; it can be seen that the test is significant, Wilk's A=.30, F (58, 308) =4.37, p<0.05, Multivariate μ^2 =.44 (Table 4.66). This implies that technological factor has a significant difference in influencing employees KS practice and organizational KS practice. Moreover, the multivariate μ^2 = .45 indicates that 45% of multivariate variance of the dependent variables is explained by the ICT factors (Table 4.66). Therefore, ICT factors can be a predictor of KS practice in the context of EEU.

Table 4.66. Multivariate Test Result for ICT Factors

Multivariate Tests[a]							
Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.935	1099.073[b]	2.000	154.000	.000	.935
	Wilks' Lambda	.065	1099.073[b]	2.000	154.000	.000	.935
	Hotelling's Trace	14.274	1099.073[b]	2.000	154.000	.000	.935
	Roy's Largest Root	14.274	1099.073[b]	2.000	154.000	.000	.935
ICT	Pillai's Trace	.853	3.976	58.000	310.000	.000	.427
	Wilks' Lambda	.301	4.366[b]	58.000	308.000	.000	.451
	Hotelling's Trace	1.808	4.769	58.000	306.000	.000	.475
	Roy's Largest Root	1.456	7.782[c]	29.000	155.000	.000	.593
a. Design: Intercept + ICT							
b. Exact statistic							
c. The statistic is an upper bound on F that yields a lower bound on the significance level.							

The results indicate that individual KS factor has a significant potential to influence both Employees' KS practice, F (29, 155) =5.35, p=.000, partial µ2 =.50 and organizational KS practice, F (29, 155) =6.60, p=.000, partial µ2 =.55 since the p-value (.000) is less than the Alpha value (.025) (Table 4.67).

Table 4.67. Tests of Between-Subject Effects due to ICT Factors

Tests of Between-Subjects Effects							
Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Employee Practice	388.798[a]	29	13.407	5.352	.000	.500
	Organization Practice	2209.861[b]	29	76.202	6.603	.000	.553
Intercept	Employee Practice	3666.082	1	3666.082	1463.558	.000	.904
	Organization Practice	18800.479	1	18800.479	1628.999	.000	.913
ICT	Employee Practice	388.798	29	13.407	5.352	.000	.500
	Organization Practice	2209.861	29	76.202	6.603	.000	.553
Error	Employee Practice	388.261	155	2.505			
	Organization Practice	1788.874	155	11.541			
Total	Employee Practice	7117.000	185				
	Organization Practice	35446.000	185				
Corrected Total	Employee Practice	777.059	184				
	Organization Practice	3998.735	184				
a. R Squared = .500 (Adjusted R Squared = .407)							
b. R Squared = .553 (Adjusted R Squared = .469)							

To substantiate the Multivariate analysis result, Multiple Linear Regression analysis has been done. Therefore, more data analysis results generated through Multiple Linear Regression method have been presented as follows.

The Multiple Linear Regression analysis presented in Table 4.68 and Table 4.69 below also affirm the findings of Univariate, Bivariate and Multivariate results that Individual dimension (Trust and Job Satisfaction), organizational dimension (Organizational Structure, Culture, Rewards and Recognition and Work Process), ICT dimension (ICT Infrastructure for KS, ICT Tools Type and ICT Know-How) and NOK dimension (Knowledge Complexity and Tacitness) can influence KS practice in EEU.

Model Summary Table 4.68

R^2=.64; Taken as a set, The predictors individual, organizational, ICT and NOK factors accounts 64% for KS practice variation.

Table 4.68. Model Summary for Knowledge Sharing Practice

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.802[a]	.642	.615	3.80850
a. Predictors: (Constant), NOK Factors, Trust, Office Layout, Work Process, ICT Infrastructure, Awareness, Structure, Job Satisfaction, Personality, ICT Tools Type, Culture, ICT Know-How, Rewards				
b. Dependent Variable: Knowledge Sharing Practice				

ANOVA Summary Table 4.69 (Test using Alpha=0.05)

The overall Regression Model is significant, F (13,171) =23.64, p<.001, R^2=.64. This implies that 64% of KS variation is explained by the individual, organizational, ICT and NOK factors (Table 4.69). Meaning all KS factors can significantly predict KS practice in EEU as group.

Table 4.69. ANOVA for Knowledge Sharing Practice

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4457.538	13	342.888	23.640	.000[b]
	Residual	2480.300	171	14.505		
	Total	6937.838	184			
a. Dependent Variable: Knowledge Sharing Practice						
b. Predictors: (Constant), NOK Factors, Trust, Office Layout, Work Process, ICT Infrastructure, Awareness, Structure, Job Satisfaction, Personality, ICT Tools Type, Culture, ICT Know-How, Rewards						

4.4. Qualitative study analysis

The qualitative study was intended to supplement the quantitative study. Therefore, from the beginning the interview questions were mapped to the questions of the questionnaires in a way that can enrich the data collected through self-administered questionnaires. For the simplicity of discussing the interview's results, the questions were grouped in to seven thematic areas: KS awareness, Organizational culture towards KS, KS mechanisms used, ICT for KS, KS factors from the perspective of Individuals, organizational, Technological and NOK, and possible strategies to improve KS practice. As noted in the methodology Chapter, nine management body staffs were interviewed three from each management hierarchies: senior management, middle management and junior management.

The first thematic area forwarded to the interviewees was about KS awareness. All attendants replied that they have KS awareness and explained KS by their own way including the importance of KS as summarized below.

> Knowledge sharing is the processes of giving one's skill and knowledge for others to pave the situation that staffs can do the office activities in the absence of others. Furthermore, knowledge sharing is used to build the capacity of employees so that it can increase the performance of the organization and make sure the survival of the institution. knowledge is not an ordinary idea; it is in the other side. So, if knowledge is not shared, it could not be a knowledge". Knowledge also helps employees to carry out tasks based on evidence other than try and error.

However, there is no organizational culture in EEU to practice KS according to all respondents. Invariably all replied that EEU doesn't have organizational KS practice and systems intended to KS.

> EEU doesn't have a formal KS/KM activity as institution except training and foreign training and education. Even the training is not based on need and gap assessment. People who took foreign education and training do not cascade the knowledge they got abroad in time of return. Moreover, EEU does not have rewards and recognition scheme to motivate employees who are engaged in KS activities.

> The newly hired employees have not been made familiar with their new job routinely except the sub-station electro-mechanical employees who are being given trainings for six months. All newly hired staffs became familiar with their job through orientation or induction if the department takes the initiative; otherwise they will be acquainted by self-study through trial and error and to some extent through colleagues.

The third thematic area was the KS mechanisms implemented or used in EEU. In this case the respondents agreed on that training is the major KS mechanism in EEU. Next to that employees take part in person or face to face KS practice. Few respondents also confirmed that they used email to share documents rarely.

> In EEU there is no mechanisms that is intended to KS purpose at all except the common trend which is training. The training part is a routine task implemented by default. Even the foreign training and education are sponsored by other countries. The email exchange practice introduced for the first time during management function outsourcing contractual agreement to Indian Companies. Since the email is personal (do not contain organizational domain), the communication is not auditable and legal. To some extent, the senior management staffs and other few experts used video conference before but not now. The other infrequently used KS mechanism is a story telling from the experienced staffs. Group mail in the ICT department is being used and meeting is also one means of KS.

The fourth thematic area is about availability of ICT for KS. In the above thematic areas, the interviewees have discussed that EEU does not have KS culture totally. Therefore, it is obvious that KS mechanisms particularly the ICT part could be very low. There is internet access and computers available but all respondents agreed invariably that “there is no ICT infrastructure implemented for KS in EEU”.

> EEU does not implement ICT to facilitate communication and KS among employees. Even the ICT infrastructure is not standardized and no intranet or any platforms to facilitate KS in EEU.

> Most of the time employees are sharing knowledge in person or face to face and meeting while very rarely email is used. Recently the EEU is developing ERP which also has a KS feature, Document Management System, to be implemented in the near future and implementing advanced call center this year. These two activities may ease the KS challenges when operating fully.

The next thematic area is about factors affecting KS in EEU. All participants agreed on the KS awareness, trust, personality, organizational structure and culture, office layout, Work process and ICT infrastructure and NOK can be considered as KS factors in EEU. All factors listed above have their own contribution of role in affecting KS practice in EEU specially the KS culture and ICT infrastructure for KS. All interviewees invariably stressed the same mind that the existing organizational structure is conducive for KS.

> There are staffs who are hoarding their tacit knowledge even about the organizational policy and procedures for their own purpose and interest. Staffs consider KS as a threat for their survival and lack willingness to share with their colleagues. The organization, EEU, doesn't have a culture of rewarding and recognizing employees for KS. As a result, there is no knowledge retention practice and system to perform such activities at all. The other notable factor is the absence of ICT infrastructure for KS. Regarding NOK, in the department of distribution network there is tacit knowledge that resides in fewer experienced employees that is not documented and coded.

The sixth thematic area is about knowledge retention. This is directly related to KS culture of EEU. In the previous thematic areas, the respondents support the absence of KS culture in EEU. Therefore, it confirms that EEU does not retain individual knowledge in any kind of form. As a result, EEU rehire the retired staffs who have peculiar expertise that could not be replaced by other employees. EEU also outsources its major business functions due to volume of work to focus on strategic functions or to create experience opportunities from high expertise as well as due to lack of expertise in EEU as well.

> The big gap about KS in EEU is failing to retain staffs' tacit knowledge. EEU even does not organize the explicit knowledge in such a way that staffs can access and use it for their daily work. EEU is not retain experienced staff's tacit knowledge and no effective succession plan before the experienced and aged or other staffs leave the office for different reasons. This challenge imposes on EEU to rehire the retired staffs. Even EEU is extending aged staffs' retirement time to fill this knowledge gap. The outsourcing also practiced due to many reasons. Among these, lack of expertise is one. This is directly connected with the failure to retain knowledge.

The last thematic area is focusing on the possible strategies to overcome the challenges enumerated and forwarded by the respondents to improve the current KS challenges in the organization. The KS encounters several type of factors that are spanning around the individual, organizational, Technological and NOK according to the previous discussions. Based on the KS factors identified, the respondents proposed several strategies to improve KS practice in EEU.

> EEU should set up KS structure and system as an organization in the first place to use its knowledge resource and to retain staffs' tacit knowledge. Therefore, EEU should implement succession policy and plan, provide a rewards and recognition scheme for employees who are engaged in KS activities and put in place ICT infrastructure for KS. Improve the culture of KS and locate where tacit and explicit knowledge resides then organize them in a proper platform and make them accessible for employees. Capture the challenges, lesson learned and expertise ideas from active projects that EEU outsourced. Moreover, EEU should set up its own advanced training center. In general, KS strategies should be a core task in future for EEU.

Generally, the respondents forwarded similar suggestions about KS from the individual, organizational, technological and NOK perspectives. Most respondents also proposed similar strategies to reduce the existing KS challenges in EEU.

Finally, eleven departments: energy management, EHS and Q and PE, Corporate planning, Finance policy and reporting and Fund management and Treasury, Human development, Human Resource CEO office, Distribution (wiring and retail), ICT, ERP and design Engineering and Localization have been observed and assessed using the prepared check list to add more information. Uniformly, all departments have internet access and computers. Regarding to space availability, except ERP and design Engineering and Localization departments all have meeting hall. Whereas, in most departments there is no scheduled and planned meeting to discuss electric service challenges and gaps. No KS artifacts posted or put on table or elsewhere like magazine that targeting knowledge sharing among employees.

4.5. Discussion

The general objective of this study is identifying factors affecting KS in EEU. In doing this, four KS dimensions are determined. These are, NOK, Individual, Organizational and Technological dimensions. In subsidiary of the above realization, this research also came up with a KS Framework to represent and understand more the existing KS practice of EEU. To this end, the research was interested in the following two research questions:

1. What are the factors affecting KS among employees in EEU?
2. How does intra-organisational KS take place in EEU?

To answer on these questions, literatures were reviewed and majorly quantitative and qualitative data collection methods were used. Therefore, the results of the study have been discussed below accordingly.

4.5.1 Nature of Knowledge Factor

NOK in EEU has been assessed through structured quantitative study and semi-structured interview. Under Univariate analysis, 36% of the respondents describe that the NOK is complex while 43% participants confirmed not. For the tacitness 32% of the respondents believed that the NOK in EEU is sticky while 28% considered it as leaky (Table 4.26-27). About 80% of the interviewees also confirm that the electrical engineering part is more or less sticky in nature to share verbally and in written form. Al-Salti Z. S. (2011) also noted that knowledge was difficult to be shared because of its complexity and tacitness in their study.

The Bivariate correlation analysis also depicts that NOK has a significant association with KS practice (Table 4.41). Moreover, the Multivariate analysis result shows that NOK can be a factor to influence KS practice in EEU (Table 4.57).

4.5.2. Individual Factors

The individual KS factors is comprised of four components: awareness (Lee & Al-Hawamdeh, 2002; Ismail & Yusof, 2010), trust (Sharratt & Usoro, 2003; Ismail & Yusof, 2010), personality (Awad & Ghaziri, 2004; Ismail & Yusof, 2010) and job satisfaction (Engstrom, 2003; Ismail & Yusof, 2010). The awareness about the important of knowledge sharing is considered as an attitude that every employee should have including the top management (Van den Brink, 2003; Ismail & Yusof, 2010). Of these KS factors, about 80.5% of the participants have awareness on KS (Table 4.14). Similar study shows that 73% respondents have awareness on KS sharing (Sandhu, Jain, & Ahmad, 2011) which is closer each other. This is statistical satisfactory for one's organization for venture in to KS. But it does not mean that the remaining smallest staffs could not have impact on KS in the institution. Even a person can create impact on KS if he/she does not have awareness about KS. However, the majority of the respondents have know-how about KS and its importance which is a conducive environment for EEU to speed up the implementation and practice of KS strategies.

The Bivariate Spearman's analysis results assert that KS awareness has very weak negative association with KS practice; awareness and KS practice, $r(183) = -0.08$, $p=0.133$ (Table 4.42). The negative association depicts the existence of continuous improvement on KS among employees while the organization does not show any kind of improvement about KS practice. The second composite Likert Scale is Trust. According to the statistics generated in this research, half of the respondents affirm that they have trust to their colleagues (Table 4.15). According to (Sandhu, Jain, & Ahmad, 2011), 60% of the participants have trust on KS. In the case of Bivariate analysis, the result shows that the existence of a significant positive association between trust and KS practice in EEU; Trust and KS practice, $r(183) = .19$, $p=.005$ (Table 4. 43) and $r=0.37$, $p<0.01$ (Ismail & Yusof, 2010). The p-value shows that the existence of strong correlation between the two variables.

Personality affects KS activities (Ismail & Yusof, 2012). Based on this fact five questions were distributed to the respondents to assess their personality towards KS activities. The Univariate analysis describes that majority of the employees have extrovert and open personality to share knowledge and interested in helping others by sharing knowledge. Moreover, they are confident about their ability to provide knowledge for others. On average 71% of the participants have positive personality towards KS (Table 4.16) but according to Rahel & Ermias (2011) it is found 55.5%. The mean value (4=Agree) of personality in Vuori & Okkonen (2012) study shows the larger number of the respondents have extrovert personality for KS. However, half of the employees are still thinking knowledge as a power and as a result there is an act of hoarding knowledge to their own personal interest and purpose (Table 4.16).

An employee should feel satisfied with his/her daily jobs to be in knowledge sharing environment effectively (Engstrom, 2003; Ismail & Yusof, 2010). More than half of the respondents affirm that employees in EEU are not satisfied with their daily jobs (Table 4.17). Therefore, EEU as a public institution should be responsive to motivate employees on one or other ways to keep its employees engaged in KS activities. Otherwise the situation might jeopardize or put in danger the core functions of EEU. However, under this condition most of the participants (68%) felt that they often share knowledge with their colleagues which is paradox to job satisfaction findings (Table 4.17) which almost similar to Rahel & Ermias (2011), 54%.

The correlation analysis again shows the existence of significant positive association between job satisfaction and KS practice in EEU which supports the findings of Univariate analysis; Job Satisfaction and KS practice, rs (183) =0.38, p=0.000 (Table 4.45). Furthermore, the Multivariate analyses showed that 21% of the variance of KS is explained by individual factors (Table 4.60). The above findings indicate that individual factors are good determinants of KS practice in EEU and other studies also confirm this fact in which 21% of variance of KS is explained by awareness, trust and personality (Ismail & Yusof, 2010).

4.5.3. Organizational Factors

The organizational KS dimension is consisting of five Likert items: organizational structure (Syed Ikhsan & Rowland, 2004; Sharrat & Usoro, 2003; Ismail & Yusof, 2012), organizational culture (Syed Ikhsan & Rowland, 2004; Sharrat & Usoro, 2003; Ismail & Yusof, 2012), rewards

and recognitions (Lee & Al-Hawamdeh 2002; Ismail & Yusof, 2012), work process (Lee & Al-Hawamdeh, 2002; Ismail & Yusof, 2012) and office layout (Lee & Al-Hawamdeh, 2002; Ismail & Yusof, 2012).

The responses captured through quantitative study illustrates that 56% of the respondents said that the organizational structure of the EEU is not flexible to share knowledge easily (Table 4.19). But from the interview side it was different. The interviewees responded EEU's structure is flat and flexible even the EEU can develop new organizational structure any time it needs and endorses by itself without the willpower of any external body. Therefore, they argue that EEU'S organizational structure could not be a barrier to KS practice rather it is an enabling factor. Furthermore, the hypothesis test shows that the existence of significant positive relationship between organizational structure and KS practice in EEU. Based on the correlation analysis result, about 10.5% of the variation in KS practice is explained by organizational structure. Since the correlation is positive, EEU's organizational structure is considered as KS enabling factor in this study; Organizational structure and KS practice, r (183) =0.32, p=0.000 (Table 4.46).

The organizational culture is one of the KS dimensions explored to understand how much it impacts KS in EEU. The quantitative study result, 47.5%, (Table 4.20), the qualitative results and direct observation together reveal the absence of organizational culture to share knowledge. The empirical evidence (61%) shown in Table 4.30, confirms that EEU does not retain skilled and experienced employees' knowledge rather it rehires after they left the office for different reasons or extends their retirement period. Moreover, there is no succession policy and plan put in place at all. No informal KS practice and formal meeting is there that is intended to facilitate KS (Table 4.20). In respect to correlation analysis result, about 29.2% of the variation in KS practice is explained by organizational culture which depicts the positive impact on KS practice in EEU; Organizational Culture and KS practice, r (183) =0.55, p=0.000 (Table 4.47). So, improving organizational culture respect to KS could improve the KS practice among employees in EEU.

Rewards can be in terms of monetary incentives and non-monetary incentives (Bartol & Srivastava, 2002; Ismail & Yusof, 2012). To encourage and create a consistent knowledge sharing, monetary values such as financial rewards, salary increment and the like should be used

(Davenport & Prusak, 1998; Ismail & Yusof, 2012). Underpinning this argument, about 65% of the respondents do not get any motivational bonus in due of KS activities. The study shows that EEU does not have rewards and recognitions except annual salary increment to motivate its employees to be engaged in KS activities (Table 4.19) and based on Wanjau & Kenneth (2014), 68% participants assert the absence of motivational scheme in their study. Even the annual salary increment is equally and uniformly distributed for all staffs with no merit according to the interview respondents. In this study, it could be argued that it might have a negative effect on employees' motivation towards KS and innovation. Few respondents also reflect their fear in this regard during interview session.

The correlation analysis result show that about 28.7% of the variation in KS practice is explained by Rewards and Recognitions which describes the positive association with KS practice in EEU (Table 4.48) and become another potential area to focus on. Some authors suggested (Davenport & Prusak; 2000; Ismail & Yusof, 2012) that corporate planner, architects, academics and executives should give consideration and creative thought to the issue of office design which hinder corporate world citizens from working with knowledge (Ismail & Yusof, 2012). In line with this, the office layout and work process of EEU has been explored through quantitative and qualitative studies to understand the environment.

Subsequently, more than half of the respondents agreed on the inconvenience of office lay out and absence of integration of procedures and steps in daily staffs' activities (Table 4.21-22). The interview results also affirm this reality. Moreover, according to the researcher's direct observation, there are departments dispersed in different places without any technological interconnection actually which should be in one place. Again, as observed by the researcher, the physical office layout in three Addis Ababa Regions (West, South and East Addis Ababa) has the potential to restrict KS activities among employees. Finally, the Multivariate analyses showed that 38% of the variance of KS is explained by organizational factors (Table 4.63).

4.5.4. ICT Factors

Technology can enhance the KS by reducing the restriction of distance and time. The application of electronic mail, internet, collaboration technologies, bulletin boards and news groups can support the distribution of knowledge throughout an organization. However, the vast array of

technologies available to support organizations in their quest to engage in effective KS can be overwhelming. An over reliance on technology for the purpose of KS can also lead into the free-for-all mentality where everything is important and everything is shared (Greco, 1999; Islam & Khan, 2014).

EEU cannot place itself apart from this reality. With this in mind, the ICT infrastructure implemented for KS, ICT Know-How that the employees have to use the existing ICT infrastructure and ICT tools suitability in EEU to share knowledge have been investigated. The findings illustrate that 48.6% of the respondents agree with the existence of up to date ICT infrastructure but 38% of the participants do not agree with this statement (Table 4.23). Similar study conducted on Universities in Ethiopia shows that 28.9% of the participants assert the presence of the up-to-date ICT infrastructure while 26.7% do not agree with this note (Rahel & Ermias, 2011). The qualitative and researcher's direct observation results assert that except email there is no other mechanisms intended for KS. this fact too. Even, not more than one third of respondents are using email to exchange documents rarely where most do not have KS intention (Table 4.11).

The other important factor is employees' ICT Know-How. About half of the employees do not have Know-How on ICT (Table 4.24). Even 21% of the employees did not use any kind of electronic means to share knowledge so far (Table 4.11). This could be a real challenge to knowledge sharing activities in EEU. However, during the semi-structured interview and direct observation, it is understood that an ERP project is under process which incorporates KS feature known as 'Document Management System'. Finally, three hypotheses testing results found about ICT for KS results show that ICT infrastructure for KS, employees' ICT Know-How and ICT Tools Type have a significant positive impact on KS practice in EEU (Table 4.51-53). In addition to this, the Multivariate analysis result describes the same findings that KS practice in EEU has a strong positive association to be considered as a KS enabling factor in this public institution (Table 4.60).

4.5.5. Knowledge Sharing Mechanisms

KS process in local government can be supported by the Internet as it has the ability to provide users with access to any information anywhere and anytime (Canzano and Grimaldi, 2012; Ncoyini & Cilliers, 2017). According to Becerra-Fernandez and Sabherwal (2010) cited in Ncoyini & Cilliers (2017), systems that facilitate knowledge exchange are groupware, web-based access to data and databases, and repositories that include best practices databases and lessons learned systems. Furthermore, intranets also facilitate KS in organisations. Web portals are another KS mechanism used for KS as they provide links to other sites and offer opportunities to search other pieces of information (Canzano and Grimaldi, 2012; Ncoyini & Cilliers, 2017). An organisation might have any combination of both long-standing tools, such as e-mail, telephones, teleconferencing, intranets, group decision support systems, or databases, and newer interactive social media tools, such as wikis, blogs, online communities, social networking sites, and microblogging (Yuan, Zhao, Liao, & Chi, 2013).

In EEU there is an internet service infrastructure. However, about 28.6% of the employees use this internet infrastructure for email to exchange documents (Table 4.11). Mostly the email service customers are junior to senior management staffs and even this is also happing infrequently based on the evidence found from the interview respondents. There are also employees using, Social Media, Webinar, Video and Telephone conference and a combination of the above. These are the preference of employees to exchange knowledge with others. But the number of employees who uses these KS mechanisms is insignificant that spans from 1% - 8.5% except multiple mechanisms users (Table 4.11). As an institution, EEU uses training, email, Video, Telephone conference storytelling and direct observation as KS mechanisms though KS practice is still a challenge for it. Despite the fact, EEU does not use even these KS mechanisms in a regular base and systemic way to facilitate KS activities among employees.

4.5.6. Knowledge Retention and Outsourcing

The other main issue in EEU was to investigate the real driving factors that delight EEU to outsource its business functions and to rehire the retired staffs. This research question was addressed partly through quantitatively whether EEU retains highly skilled and experienced staffs' knowledge before they leave the office or not, because the quantitative study does not

have a part to investigate the basic reasons behind about this. As shown in Table 4.30, 61% of the respondents ratify that EEU does not retain knowledge from these individuals. During the interview session, the management staffs also admitted this challenge as a major gap in EEU. In other words, EEU does not have the culture and initiative to retain individual tacit knowledge before they leave the office. As a result, EEU either rehires the retired staffs or extend their retirement period ahead of time. In the case of outsourcing, volume of work, intent of getting experiences from high tech projects and lack of expertise staffs in EEU force it to be engaged in fully or partly contractual agreement. Sandhum et al. (2011) in their study found that 58% of the respondents confirme that there was lack of knowledge retention whereas 22% of the participants agree with the practice.

4.5.7. Knowledge Sharing Framework

The Quantitative (Univariate, Bivariate and Multivariate) and Qualitative studies' results discussed above affirms that Trust and Job Satisfaction from Individual dimension, Structure, Culture, Rewards and Recognitions from Organizational dimension, complexity and Tacitness from NOK, ICT infrastructure, ICT know-how and ICT Tools type from Technological dimensions have impact on or correlated with KS practice at EEU (Table 4.70 and Table 4.71). As shown in Table 4.70 below, except Awareness, Personality and Office Layout all KS factors have a significant positive association with KS practice. This implies that these KS factors can influence positively KS activities in EEU.

Table 4.70. One-Tailed Bivariate Analysis Findings (n=185)

KS Factors	R-values	p-values
Nature of Knowledge	.180 (weakly positive association)	.007 (sig.)
Awareness	-.082 (very weak negative association)	.133 (not sig.)
Trust	.190 (weakly positive association)	.005 (sig.)
Personality	-.027 (very weak negative association)	.359 (not sig.)
Job Satisfaction	.380 (weakly positive association)	.000 (sig.)
Rewards and Recognitions	.553 (moderately positive association)	000 (sig.)
Organizational Structure	.324 (weakly positive association)	.000 (sig.)
Organizational Culture	.551 (moderately positive association)	.000 (sig.)
Office Layout	.041 (very weak positive association)	.290 (not sig.)
Work Process	.397 (moderately positive association)	.000 (sig.)
ICT Infrastructure	.449 (moderately positive association)	.000 (sig.)
ICT Know-How	.608 (moderately positive association)	.000 (sig.)
ICT Tools Type	.600 (moderately positive association)	.000 (sig.)

Moreover, the Multivariate analysis done using KS factors that have a significant positive association with KS practice. As shown in Table 4.71, each KS factors evaluated with Alpha value (.05) and found to be statistically significance to influence both the dependent variables; significant at the .05 level. However, NOK does not have impact to organizational KS practice from the perspective of the items used to assess the KS practice of EEU (Table 4.71).

Table 4.71. One Factor MANOVA Results Summary (n=185)

KS Dimensions	KS Factors	Significance Level to Dependent Variables	
		Employees KS Practice	Organizational KS Practice
NOK Dimension	Nature of Knowledge	p-value=.128 (not sig.)	p-value=.001 (sig.)
Individual Dimension	Trust	p-value=.000 (sig.)	p-value=.000 (sig.)
	Job Satisfaction		
Organizational Dimension	Rewards and Recognitions	p-value=.000 (sig.)	p-value=.000 (sig.)
	Structure		
	Culture		
	Work Process		
Technological Dimension	ICT Infrastructure	p-value=.000 (sig.)	p-value=.000 (sig.)
	ICT Know-How		
	ICT Tools Type		

Consequently, the following knowledge sharing Frame work is made ready (Figure 4.1) based on the above this study's findings and research KS model perspective which is supposed to have useful contribution to enhance KS activities in EEU. Meaning, this KS Framework is believed to contribute in designing and implementing KS strategies in EEU. Moreover, 48% (rounded) of the respondents confirm that EEU does not encourage new idea focusing on learning from failure (Table 4.72). Finally, in enriching the quantitative findings and meeting objective, the KS Frame work was evaluated by seven selected senior to junior management staffs using checklist.

Few evaluators suggested that the leadership role to be included in the Framework. However, majorly the organizational factors and ICT factors are clearly the role of the leadership. Therefore, the proposed modification idea is already included implicitly. Otherwise, each evaluator agreed on the Frameworks' potential to describe the existing KS practice of EEU and its usefulness for KS practice in the future at EEU. Moreover, the evaluators express their view on which the Framework can help the EEU during KS strategies planning process and implementation phase.

Table 4.72. Encouraging for New Idea (n=185)

EEU ENCOURAGES NEW IDEA			
Encouraging New Idea		Percent	Cumulative Percent
	Strongly Disagree	12.4	12.4
	Disagree	35.1	47.6
	Neutral	22.7	70.3
	Agree	23.8	94.1
	Strongly agree	5.9	100.0
	Total	100.0	

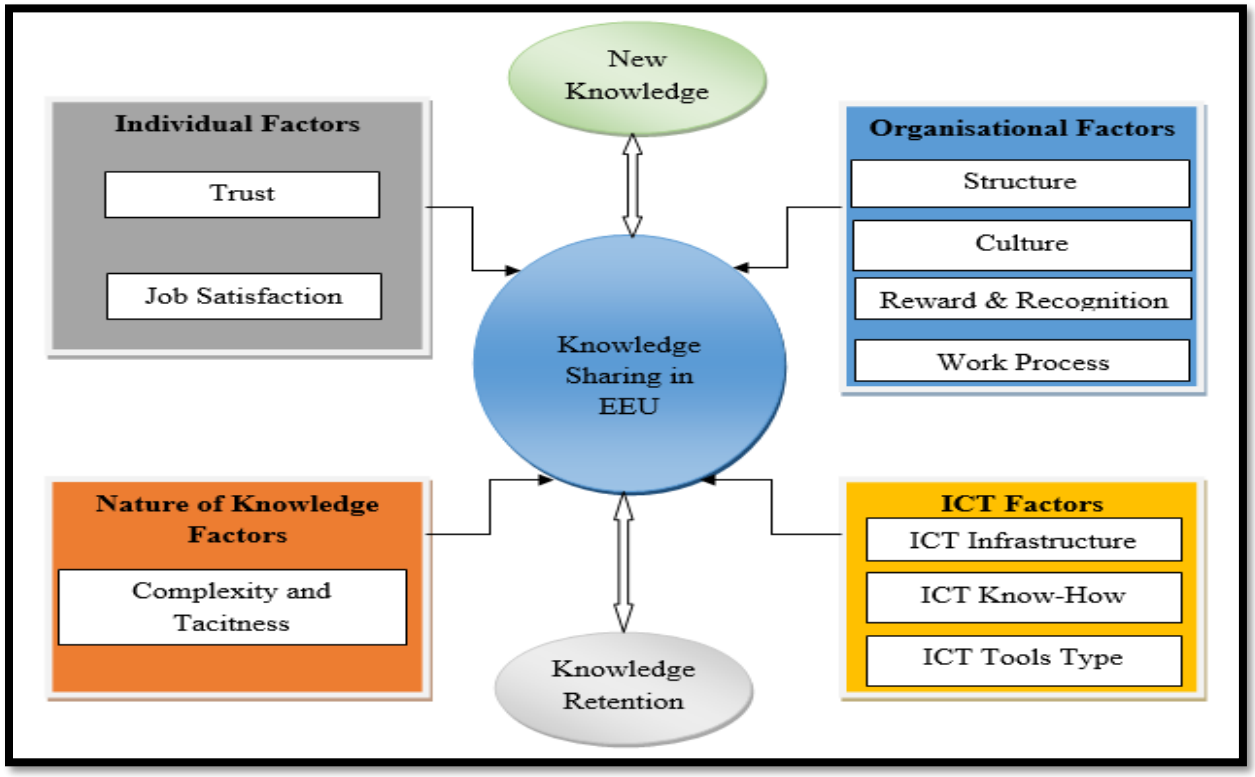

Figure 4.1. Knowledge Sharing Framework in EEU

4.6. Chapter Summary

This chapter presented and discussed the findings of the quantitative and qualitative study as well as the direct observation steered in EEU to identify factors affecting KS practice. The data collected through questionnaires was presented in the form of demographic description, Univariate variable, Bivariate and Multivariate accepted point of view. Then, discussions, description and interpretation of statistical findings has been made so.

The qualitative data has been also grouped in to seven thematic areas and presented properly by comparing with the study's finding asserted through quantitative method. Then after, a KS Framework produced based on the KS factors identified and found to be statistically significant.

The KS Framework was evaluated for its simplicity, usability, usefulness and understandably using the check list designed for this purpose. In discussion part, the results of the research raised in detail and viewed in cross-sectional way to bring about the theme boldly. Moreover, the chapter addresses the internal consistence of the questions, the response rate and prepare operational definitions for key terms. In general, the findings prompt that KS achievement is determined by four main and important sets of factors: Individual factors, Organizational factors, ICT for KS factors and NOK factors. The KS mechanisms implemented in EEU and the knowledge retention and outsourcing driving factors also discussed in detail.

CHAPTER 5: CONCLUSION AND IMPLICATIONS

5.1. Conclusion

EEU is one of the public service providers in Ethiopia. Above all, it is a sole electric utilities provider by establishing its vision to energize Ethiopia and enabling the country electric utilities contributor. As a result, the organization is expected to manage its corporate knowledge resource that can assist it to move forward in the future and getting its customers satisfied. Knowledge sharing is an inevitable activity that underpins the business of knowledge management. It is a crucial activity since knowledge bears no value if it is not distributed and shared (Ismail & Yusof, 2012). Knowledge sharing is a mechanism through which knowledge held by individual is converted into organizational knowledge where it can be used to create business value (Temtim, 2014). However, EEU is outsourcing its business functions and rehiring the retired staffs to fill the knowledge gap. This could be due to a broad range of factors that influence the effectiveness of knowledge sharing and acquisition (Al-Salti, 2009).

In line with the above paragraph, this study was intended to examine and determine factors that affecting knowledge sharing and knowledge retention in EEU. To this end, four research questions were articulated to be answered through. These are, (i) What are the factors affecting KS in EEU? (ii) How does intra-organisational KS take place among EEU's employees? (iii)Why does the EEU rehires the retired staffs and outsource its major business processes and (iv)the strategy that EEU is implementing to capture the tacit knowledge of retiring electrical engineers and technical staffs? The KS dimensions were NOK, Individual, Organizational and Technological to investigate the association of each dimension with the KS practice. In doing this, thirteen hypotheses were claimed and tested against the Null hypothesis (H_0).

Of the thirteen hypothesis, three (Personality, NOK and Awareness) hypotheses were rejected while the remaining ten were accepted. In the case of significance level, except Awareness, Personality and Office Layout all have strong relationship with KS practice in EEU. In general, the correlational analysis shows that NOK (Complexity and Tacitness), Individual (Trust and Job Satisfaction) Organizational (Structure, Culture, Work Process and Rewards and Recognitions) and Technological (ICT Infrastructure, ICT Know-How and ICT Tools Type) dimensions are enabling factors to KS for this study. This is also reaffirmed through the Multivariate findings.

According to Becerra-Fernandez and Sabherwal (2010) cited in Ncoyini & Cilliers (2017), systems that facilitate knowledge exchange are groupware, web-based access to data and databases, and repositories that include best practices databases and lessons learned systems. An organisation might have any combination of both long-standing tools, such as e-mail, telephones, teleconferencing, intranets, group decision support systems, or databases, and newer interactive social media tools, such as wikis, blogs, online communities, social networking sites, and microblogging (Yuan, Zhao, Liao, & Chi, 2013). EEU uses training, email, storytelling and direct observation as KS mechanisms. Despite the fact, EEU does not use even these KS mechanisms in a regular base and systemic way to facilitate KS activities among employees. For instance, it is about 27% of the employees use the internet infrastructure for email to exchange documents (Table 4.11). Therefore, there is no comprehensive KS mechanisms put in place and practice of the existing ones at EEU where a critical attention is required.

The last questions of this study is about the driving factors delighting EEU to outsourcing its business functions and rehiring retired staffs and the strategy put in place to capture staffs' tacit knowledge. About 60% of the respondents ratify that EEU does not retain highly skilled and experienced staffs' tacit knowledge. The interviewees confirmed this reality invariably. Consequently, EEU either rehires the retired staffs or extend their retirement period ahead of time to fill this knowledge gap. In other words, EEU does not have the culture and strategy or initiative to retain individuals' tacit knowledge before they leave the office or retire. In the case of outsourcing, volume of work, intent of getting experiences from high tech projects and lack of staffs with the required knowledge in EEU force it to be engaged in fully or partly contractual agreement. Therefore, implementing strategy to capture the tacit knowledge of senior and aged electrical engineers and technicians is a valuable endeavor for EEU.

Finally, a KS framework is prepared mainly based on the Bivariate and Multivariate analysis results found about ten KS factors identified which influence the practice of knowledge sharing in EEU. Those KS factors are grouped into four categories which are NOK factors, Individual factors, Organizational factors and Technological factors. The constructs have been operationally defined based on the scope of the research noted under Chapter one. The KS Framework was evaluated by senior, middle and junior staffs to increase its importance to EEU as well.

5.2. Recommendations

The findings describe the KS practice in EEU and factors affecting it. The descriptive statistics, the correlation analysis (Bivariate and Multivariate), the interview results and direct observation in joint show that the existence of chasm about KS practice in EEU in all four aspects of the study dimensions (NOK factors, Individual factors, Organizational factors and Technological factors). As an electric utilities provider, EEU needs to addresses its changing demographics and the challenges associated with a changing workforce. The main and critical failure of EEU about KS is its inability to retain aged staffs' knowledge before they leave the organization. Therefore, these findings offer essential statistical evidence for management body through empirical facts and presented through KS Framework to bring improvement in this regard. Consequently, EEU can better leverage its know-how about KS to improve its organizational culture towards KS and make sure operation continuity for the delivery of safe, reliable, and sustainable electric utilities for the customers across the country.

The leadership also needs to become aware about the significance of KS in achieving organizational effectiveness, quality service delivery and work environment characterized by knowledge based and knowledge driven one. Therefore, EEU needs to encourage organizational culture that foster collaboration, trust, team work, employees' motivation which are most significant in the implementation of KS practices. Organization Culture creates suitable environments for knowledge exchange and accessibility. Because it is obvious that individuals are unlikely to share their knowledge without a trusting feeling between each other's.

ICT plays a fundamental role in KS practices as it determines how new knowledge is sourced, stored and disseminated in the organization, therefore, EEU should exert a maximum effort to have ICT infrastructure for KS and scale up the Know-How of its employees about the ICT infrastructure implemented. This will in turn speed up the proper use of the ICT infrastructure and the exchange of quality knowledge in time among the employees since human resource capacity determines the requisite skills to effectively execute KS practices. ICT infrastructure is crucial for KS. However, if culture of collaboration and knowledge sharing does not exist, the infrastructures will give minimal benefit to organizations.

Full effect of KS is gained when leadership, culture and organizational structure encouraging learning, knowledge sharing and exchange are developed.

One of the main issues related to technology is to select the appropriate and suitable application that can provide the best communication link among employees to enhance KS activity (Supar, 2012; Norulkamar et al., 2014). The strategy must be shaped according to organizational structure and culture. Standards of knowledge exchange, sharing and modeling and standards for the measurement of knowledge work will be critical in that effort. Technology can offer big access to large amounts of data and information. Therefore, to pave the way in improving intra-organizational KS practice and knowledge retention in EEU the researcher believes that considering the findings and use of the KS Framework opens the lane for good start. In summary, the following recommendations are outlined:

- Implement Motivational scheme
- Conduct formal and informal meeting intending KS
- Establish standard and regular system to introduce new employees about their new job on entry
- Put in place secession strategy and plan
- Integrate KS with Performance evaluation process (task employees that sharing knowledge is part of their daily work)
- Give a special attention to capture the tacit knowledge of senior and aged electrical engineers
- Capture the challenges, lesson learned and expertise ideas from active projects that EEU outsourced.
- EEU needs to establish its own training center and knowledge base
- Conduct gap and need assessment before providing training
- Scale up management's awareness about KS
- Invest on ICT infrastructure dedicated for KS and scale up employees' ICT know-how
- Reward and Recognize new ideas, encourage tea work
- Use audio-visual and other comprehensive KS mechanisms platforms to capture and organize knowledge resources

5.3. Contribution to Practice

This study contributes important findings to EEU on KS practice in which the decision-making bodies could take proper actions timely to improve KS practice and knowledge retention. The KS framework again offers general guidance for KS practitioners to develop and carry out an effective KS strategy to fill the gaps identified in this research. The major influencing KS factors in EEU are Trust, Job Satisfaction, organizational Culture, Structure, Rewards and Recognitions, Work Process and ICT for KS in EEU. Therefore, EEU management bodies can make improvement by understanding these factors and other related areas to meet the KS outcomes.

5.4. Limitation of the Study

Regarding to the quantitative research, the respondents may exaggerate or undermine some organizational or/and individual facts due to their personal prejudice they have about EEU or other domains. The researcher tried to reduce such kind of biases ahead of time by incorporating the purpose of the research under the cover page and during questionnaire distribution. But, it is unnatural to claim that this research is free from respondents' bias. The finding shows that meeting is one of the KS mechanisms but actually it is not. So, it should be investigated further. The study does not include the KS practice, attitude, behavior and awareness of employees with less than two years' experience and who do not have at least first degree.

5.5. Recommendation for Future research

This research delivers new comprehension and appeals valuable findings regard to knowledge sharing in EEU. As a result, this finding can be taken as an indication in which the KS challenges can happen or exist in the rest of government institutions. Therefore, similar studies in other government offices may be recommended to investigate factors affecting KS. Moreover, in the future if the EEU implements KS practice fully, it is also possible to check the role or contribution of KS for its organizational performance and knowledge retention practice improvement as well. Finally, a research can be conducted in-depth by taking KS factor like 'Trust' or organizational culture or leadership role and ICT for KS one at a time.

REFERENECES

Abiy, Z., Alemayehu, W., Daniel, T., Melese, G., & Yilma, S. (2009). *Introduction to Research Methodes.* Addis Ababa: Addis Ababa Press.

Abzari, M., Shahin, A., & Abasaltian, A. (2014). Developing A Conceptual Framework For Knowledge Sharing Behavior By Considering Emotional, Social And Cognitive Intelligence Competencies. *Kuwait Chapter of Arabian Journal of Business and Management Review), 4*(1), 230-237.

Adem, A. (2010). *Knowledge Sharing Among Health Professionals: The Case Of Felege Hiwot Referal Hospital.* Addis Ababa: MSC Thesis.

Agarwal, N. K., & Marouf, L. (2016). Quantitative and qualitative instruments for knowledge management readiness assessment in universities . *Qualitative and Quantitative Methods in Libraries (QQML) 5*, 149-164.

Alavi, M., & Leidner, D. E. (1999). Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues. *MIS Quarterly*, 64-65.

Al-Qdah, M. S., & Salim, J. (2013). A Conceptual Framework for Managing Tacit Knowledge through ICT Perspective. *Al-Qdah and Juhana Salim / Procedia Technology 11*, (pp. 1188 – 1194).

Al-Salti, Z. (2009). Knowledge Transfer and Acquisition in IS Outsourcing: Towards a Conceptual Framework. *BBS Doctoral Symposium* (pp. 3-4). Brunel: Brunel Business School.

Al-Salti, Z. S. (2011). *An Investigation Of Knowledge Transfer In Information Systems (Is) Outsourcing.* Doctoral Dissertation.

Al-Salti, Z., Hackney, R., & Özkan, S. (2010). Factors Impacting Knowledge Transfer Success In Information Systems Outsourcing. *European, Mediterranean & Middle Eastern Conference on Information Systems* (pp. 4-5). Abu Dhabi, UAE: EMCIS2010.

Amezenech, A. (2014). *Assessment Of Knowledge Sharing Practices And Continuous Learning Commitment Of Health Care Professionals In Hospitals In Hawassa.* Addis Ababa: MSC Thesis.

Andreasian, G., & Andreasian, M. (2013). *Knowledge Sharing and Knowledge Transfer Barriers. A Case Study.* Ukrain: MSc Thesis.

Arisha, Amr, Ragab, & Mohamed. (2013). Knowledge Management and Measurement: a Critical Review. *Journal of Knowledge Management 17(6)*, 5-11.

Asrar-ul-Haq, M., & Anwar, S. (2016). A systematic review of knowledge management and knowledge sharing: Trends, issues, and challenges. *Cogent Business & Management 3*, http://dx.doi.org/10.1080/23311975.2015.112774.

Ayodele, F. O., Yao, L., Haron, H. B., & Juan, S. H. (2016). Review on Knowledge Sharing: Barriers and Motivations. *The National Conference for Postgraduate Research* (pp. 165-169). Pahang: Universiti Malaysia Pahang.

Beins, B. C., & McCarthy, M. A. (2012). *Research Methods and Statistics.* New Jersey: Pearson Education, Inc.

Bethelehem, L. (2017). *A Framework to Support Knowledge Sharing Practice among Health Care Professionals at Yekatit 12 Hospital Medical College.* AA: MSC Thesis.

Bhojaraju, G. (2005). Knowledge Management: Why Do We Need It For Corporates. *Malaysian Journal of Library & Information Science 10(2)*, 37-50.

CETIN, M., & KINI, F. S. (2017). The Paradigm Of Knowledge Management In Higher Education: A Qualitative Exploration Of Organizational Factors Affecting Km Readiness . *International Journal of Management and Applied Science 3(9)*, 94-102.

Dalkir, K. (2005). *Knowledge Management in Theory and Practice.* London: McGill University.

Dawson, C. (2002). *Practical Research Methods.* UK: How To Books Ltd.

Dharmasiri, A. S. (2011). A Study of Knowledge Sharing Practices of Civil Society Organizations in Sri Lanka. *Sutheshna Kodeeswaran 16(1-2)*, 114-119.

E.Jennex, M., & E.Bartczak, S. (2013). A Revised Knowledge Pyramid. *International Journal of Knowledge Management, 9*(3), 19-30.

EEP. (2018, February 28). *www.eep.gov.et/profile*. Retrieved February 28, 2018, from www.eep.gov.et: http://www.eep.gov.et

ERKELENS, R., HOOFF, B. V., HUYSMAN, M., & VLAAR, P. (2015). Learning From Locally Embedded Knowledge: Cilitating Organizational Learning In Geographically Dispersed Settings. *Global Strategy Journal*, https://onlinelibrary.wiley.com/doi/full/10.1002/gsj.1092.

GAGN, M. (2009). A Model Of Knowledge-Sharing Motivation. *Éohn Molson School of Business, Concordia University 48(4)*, 571– 589.

Gavrilova, T., & Andreeva, T. (2012). Knowledge elicitation techniques in a knowledge management context. *Journal of Knowledge Management 16(4)*, 523-537.

Gogtay, N., & Thatte, U. (2017). Principles of Correlation Analysis. *Journal of The Association of Physicians of India 65*, 78-81.

Grant, K. A. (2007). Tacit Knowledge Revisited – We Can Still Learn from Polanyi . *The Electronic Journal of Knowledge 5(2)*, 173-10.

Gu, Huang, Q., Davison, R. M., & Jibao. (2008). Impact of personal and cultural factors on knowledge sharing in China. *Asia Pacific Journal of Management 25(3)*, 451-471.

Hackney, R., Özkan, S., & Al-Salti, Z. (2010). Factors Impacting Knowledge Transfer Success In Information Systems Outsourcing. *European, Mediterranean & Middle Eastern Conference on Information Systems.* Abu Dhabi, UAE .

HAREYA, G. (2011). *Knowledge Sharing Among Employees Of Mesfin Industrial Engineering.* Addis Ababa: MSc Thesis.

Haslinda, A., & Sarinah, A. (2009). A Review of Knowledge Management Models . *The Journal of International Social Research*.

Hicks, R. C., Dattero, R., & Galup, S. D. (2006). The five-tier knowledge management hierarchy. *Journal Of Knowledge Management 10(1)*, 19-31.

Ingari, B. K., & Ali, I. (2017). Inter-Firm Knowledge Sharing Strategies To Ensure Successful Public Outsourcing In Kenyan County Governments. *International Journal of Scientific and Research Publications 7(2)*, 2250-3153.

Ipe, M. (2003). Knowledge Sharing in Organizations: A Conceptual Framework. *SAGE Publications 2(4)*, 337-359.

Islam, S., & Khan, R. H. (2014). Exploring the Factors Affecting Knowledge Sharing Practices in Dhaka University Library. *Library Philosophy and Practice (e-journal)*, 2-11.

Ismail, M. B., & Yusof, Z. M. (2010). The Impact of Individual Factors on Knowledge Sharing Quality. *Journal of Organizational Knowledge Management*, 1-13 DOI: 10.5171/2010.327569 .

Ismail, M. B., & Yusof, Z. M. (2012). Factors Affecting Knowledge Sharing In Public Organizations In Malaysia. *Faculty of Technology and Information Science, Universiti Kebangsaan Malaysia.*, 165-169.

Jennex, M. E., & Durcikova, A. (2013). Assessing Knowledge Loss Risk. *2013 46th Hawaii International Conference on System Sciences* (pp. 3478-3486). Hawaii: IEEE.

King, W. R. (2009). Knowledge Management and Organizational Learning. *Annals of Information Systems 4*, 3-12.

Kothari, C. (2004). *Research Methodology Tecchniques and Methods.* Jaipur: New Age International.

Krejcie, R. V., & Morgan, D. W. (1970). Determining Sample Size For Research Activities. *Educational And Psychological Measurement 30*, 607-610.

Ladd, D. A. (2002). *An Investigation Of Environmental Factors That Influence Knowledge Transfer In The Air Force.* Ohio: MSc Thesis .

Lam, W., & Chua., A. Y. (2009). Knowledge outsourcing: an alternative strategy for knowledge management. *JOURNAL OF KNOWLEDGE MANAGEMEN 13(3)*, 28-43.

Lee, H.-Y., & Roth, G. L. (2009). A Conceptual Framework For Examining Knowledge Management N Higher Education Contexts. *New Horizons in Adult Education and Human Resource Development 23(4)*, 22-36.

LENTH, R. V. (2001). Some Practical Guidelines for Effective Sample Size Determination. *he American Statistician 55(3)*, 187-192.

Liao, S.-h., Fei, W.-C., & Chen, C.-C. (2006). Knowledge sharing, absorptive capacity, and innovation capability: an empirical study of Taiwan's knowledge-intensive industries. *Journal of Information Science 33(3)*, 340–359.

Lin, H.-F. (2007). A stage model of knowledge management: an empirical investigation of process and effectiveness. *ournal of Information Science 33 (6)*, pp. 643–659.

Lin, H.-F. (2007). Knowledge sharing and firm innovation capability: An empirical study. *nternational Journal of Manpower 28(3-4)*, 315-332.

Mahmoudsalehi, M., Moradkhannejad, R., & Safari, K. (2012). How knowledge management is affected by organizational structure. *The Learning Organization 19(6)*, 518-528.

Manus, P. M. (2016). Examining the Factors to Knowledge Sharing within an Organisational Context. *Irish Academy of Management Doctoral Colloquium* (pp. 4-5). Dublin: Dublin Institute of Technology.

Marshall, M. N. (1996). Sampling for qualitative research. *Family Practice 13(6)*, 522-525.

Martins, E. C., & Meyer, H. W. (2012). Organizational and behavioral factors that influence knowledge retention . *ournal of Knowledge Management 16(1)* , 77-96 https://doi.org/10.1108/13673271211198954.

Mesfin, W. (2017). *Exploring Factors Affecting Knowledge Transfer Process in Information System Outsourcing at Ethio Telecom.* AA: MSC Thesis.

Mills, A. M., & Smith, T. A. (2011). Knowledge management and organizational performance: a decomposed view. *Journal of Knowledge Management 15(1)*, 156-171.

Milovanović, S. (2011). Aims And Critical Success Factors Of Knowledge Management System Projects. *Facta Universitatis 8(1)*, 31-40.

Mohajan, H. (2017). Tacit Knowledge for the Development of Organizations. *ABC Journal of Advanced Research 6(1)*, 17-24.

Moinester, M., & Gottfried, R. (2014). Sample size estimation for correlations with pre-specified confidence interval. *The Quantitative Methods for Psychology 10(2)*, 124-130.

Morris, R. (2013). Motivating and retaining local government workers: what does it take? *Proceedings of the 3 National Local Government Researchers' Forum .* Adelaide: Edith Cowan University.

Najibullah, A., Darren, G., & Muhammad, K. (2013). *Barriers and Enablers of Knowledge Sharing: A qualitative Study of ABB, Bombardier, Ericsson and Siemens.* Vasteras: Bachelor Thesis.

Nassuora, A. B. (2011). Knowledge Sharing In Institutions Of Higher Learning. *American Academic & Scholarly Research Journal 1(1)*, 1-6.

Nawaz, N., & Gomes, A. M. (2014). Review of Knowledge Management in Higher Education Institutions. *European Journal of Business and Management 7(6)*, 71-77.

Ncoyini, S., & Cilliers, L. (2017). Critical Success Factors To Improve Knowledge Sharing In South African Local Government. *Proceedings of the 28th Annual Conference of the Southern African Institute of Management Scientists* (pp. 573-582). African Journal of Hospitality.

Nonaka, I. (1994). A Dynamic Theory of Organizational Knowledge Creation. *The Institute of Management Science 5(1)*, 14-37.

Nonaka, I., & Krogh, G. v. (2009). Perspective—Tacit Knowledge and Knowledge Conversion: Controversy and Advancement in Organizational. *Organization Science*.

Nonaka, I., & Krogh, G. v. (2009). Tacit Knowledge and Knowledge Conversion: Controversy and Advancement in Organizational. *Perspective Organization Science 20(3)*, 635–652.

Nonaka, I., Toyama, R., Konno, & Noboru. (2000). SECI, Ba and Leadership: a Unified Model of Dynamic Knowledge Creation. *Elsevier Science Ltd 33*, 5-34.

Nonaka, l., & Konno, N. (1998). The Concept of "Ba": Building A Foundation For Knowledge Creation. *California Management Review 40(3)*, 40-54.

Noor, N. M., & Salim, J. (2011). Factors Influencing Employee Knowledge Sharing Capabilities in Electronic Government Agencies in Malaysia. *International Journal of Computer Science, 8*(4).

Norulkamar, U., & Hatamleh, A. (2014). A Review of Knowledge Sharing Barriers among Academic Staff-A Malaysian Perspective. *Department of Management, Universiti Teknologi Malaysia 2(2)*, 87-91.

Olsen, h., & George, D. M. (2004). *Cross-Sectional Study Design and Data Analysis.* Web: www.collegeboard.com: College Entrance Examination Board.

Olum, Y. (2014, July 12). Modern Management Theories And Practices. *Kenya School of Monetary Studies.*, pp. 2-23.

Omotayo, F. O. (2015). Knowledge Management as an important tool in Organisational Management: A Review of Literature. *Library Philosophy and Practice (e-journal)*, 2-16.

Østerlund, C., & Carlile, P. (2005). Relations in Practice: Sorting Through Practice Theories on Knowledge Sharing in Complex Organizations. *The Information Society 21*, 21-107.

Paroutis, S., & Saleh, A. A. (2009). Determinants of knowledge sharing using Web 2.0 technologies. *Journal Of Knowledge Management 13(4),* 52-63.

Paulin, D., & Suneson, K. (2012). Knowledge Transfer Knowledge Sharing and Knowledge Barriers. *The Electronic Journal of Knowledge Management 10(1),* 81-91.

Perjanik, N. S. (2016). *Tacit Knowledge Capture and the Brain-Drain at Electrical Utilities.* california: Dissertation.

Rahel, B., & Ermias, A. (2011). Prospects of Knowledge Sharing Among Ethiopian Institutions of Higher Learning. *Ee-JRIF 3(2)*, 20-35.

Razmerita, L., Kirchner, K., & Nielsen, P. (2016). What Factors Influence Knowledge Sharing in Organizations?: A Social Dilemma Perspective of Social Media Communication. *Journal of Knowledge Management 20 (6).*

Riege, A. (2005). Three-dozen knowledge-sharing barriers managers must consider. *JOURNAL OF KNOWLEDGE MANAGEMENT 9(3),* 18-35.

Rivera, J. C., Ortiz, V. L., & Flores, F. F. (2009). Overcoming cultural barriers for innovation and knowledge sharing. *Journal of Knowledge Management13(5),* 257-270.

Saccenti, E., Hoefsloot, H. C., Smilde, A. K., Westerhuis, J. A., & Hendriks, M. M. (2013). Reflections on univariate and multivariate analysis of metabolomics data.

Sandhu, M. S., Jain, K. K., & Ahmad, I. U. (2011). Knowledge sharing among public sector employees: evidence from Malaysia. *nternational Journal of Public Sector 24(3),* 206=226.

Santos, V. R., Soares, A. L., & Carvalho, J. Á. (2012). Knowledge Sharing Barriers in Complex Research and Development Projects: an Exploratory Study on the Perceptions of Managers. *Knowledge and Process Management 10,* 2-10.

Schutte, N., & Barkhuizen, N. (2015). Knowledge Management and Sharing in Local Government: A Social Identity Theory Perspective. *The Electronic Journal of Knowledge Management 13(2),* 130-141.

Sedziuviene, N., & Vveinhardt, J. (2009). The Paradigm of Knowledge Management in Higher Educational Institutions. *Inzinerine Ekonomika-Engineering Economics 5*, 79-85.

Sharma, B. P., Singh, M. D., & Neha. (2012). Knowledge Sharing Barriers: An Approach f Interpretive Structural Modeling. *IUP*.

Sheikhi, M. (2015). The Analysis Of Knowledge Management In The Electric Power Distribution Companies In Iran (Case Study: Alborz Electricity Province Distribution Company). *Indian Journal of Fundamental and Applied Life Sciences 5(S1),* 525-532.

Singh, A. S., & Masuku, M. B. (2014). Sampling Techniques & Determination Of Sample Size In Applied Statistics Research: An Overview . *International Journal of Economics, Commerce and Management 2(11),* 4.

Supar, N. (2012). Technological Factors Affecting Knowledge Sharing among Academic Staff in Selected Malaysian Higher Educational Institutions and the Effect on Performance. *Journal of Education and Vocational Research 2(7)*, 234-241.

Supar, N. (2012). Technological Factors Affecting Knowledge Sharing among Academic Staff in Selected Malaysian Higher Educational Institutions and the Effect on Performance . *Journal of Education and Vocational Research 3(7)*, 234-241.

Szulanski, G. (1996). Exploring Internal Stickiness: Impediments to the Transfer of Best Practice Within Firm. *Strategic Management Journal 17*, 27-43.

Takeuchi, H. (2006). The New Dynamism of the Knowledge-Creating Company . *JKE2_ch01.qxd*, 2-9.

Temtim, A. D. (2014). *Enabling Knowledge Sharing in the Workplace: The Case of Commercial Bank of Ethiopia (CBE).* Addis Ababa: Dissertation Paper.

Topchyan, R. (2013). *Factors Affecting Knowledge Sharing In Virtual Learning Teams.* Maryland: Instructional Design, Development and Evaluation-Dessertation Paper 61.

Vuori, V., & Okkonen, J. (2012). Knowledge sharing motivational factors of using an intra-organizational social media platform. *Journal Of Knowledge Management 16(4)*, 592-603.

Wanjau, & Kenneth. (2014). Factors Affecting Implementation Of Knowledge Management. *International Journal of Management Technology 2(1)*, 45-54.

Wijk, R. v., Jansen, J. J., & Lyles, M. A. (2008). Inter- and Intra-Organizational Knowledge Transfer: A Meta-Analytic Review and Assessment of its Antecedents and Consequences. *Journal of Management Studies 45*, 831-849.

Yozgat, U., Demirbağ, O., & Şahin, S. (2013). The Impact of Knowledge Sharing and Partnership Quality on Outsourcing Success. *Kırklareli University, Vocational School of Health Service 63(10)*, 50-53.

Yuan, Y. C., Zhao, X., Liao, Q., & Chi, C. (2013). The Use of Different Information and Communication Technologies to Support Knowledge Sharing in Organizations: From E-Mail to Micro-Blogging. *Journal Of The American Society For Information Science And Technology 61(8)*, 1659-1670.

ANNEX-I: QUESTIONNAIRE

Letter of Introduction and Informed Consent Form

Study Title:

Factors Affecting KS in Public Service Institution: The Case of Ethiopian Electric Utility

Researcher: Raey Zewdie Tirfie

Purpose of the Study

In the beginning, the Research Ethics Board of Addis Ababa University College of Natural Science School of Information Science has approved this study. It is designed to investigate the factors affecting knowledge sharing in EEU. The study is being conducting to learn more about this Title since it has not been studied in the past in the context of EEU. The knowledge obtained from this study will be of great value in guiding EEU to be more effective in knowledge sharing and work on knowledge retention and creation in its own vicinity.

Explanation of Procedures

Participation in the study involves completion of a questionnaire paper that will be administered by you. The completed questionnaire also will be returned back within a week after completed in person to the coordinator assigned or the coordinator will collect accordingly. Please inform immediately the coordinator or the researcher when you withdraw from the study.

Risks and Discomforts

There are no risks or discomforts that are anticipated from your participation in the study. Rather feel and understand that you are contributing for your own organization, EEU.

Confidentiality

The information gathered during this study will remain confidential in secure premises during this project. Only the researcher will have access to the study data and information. There will not be any identifying names on the study. The results of the research will be published in the form of a Research Paper.

Further Questions and Follow-up

You are welcome to ask the researcher any questions that occur to you during the study. Therefore, I encourage you to contact the researcher using the contact information given on cover page.

Consent

I have read the above information. I freely agree to participate in this study. I understand that I am free to refuse to answer any question and to withdraw from the study at any time. I understand that my responses will be kept anonymous.

Participant Signature_____ Date_____

ANNEX II: SELF ADMINISTERED QUESTIONNAIRES

April 27, 2018

Dear Participant:

I would like to conscript your help. I am a graduate student in Information Science at Addis Ababa University College of Natural Sciences School of Information Science. I am conducting a research on factors affecting knowledge sharing for my Master's Thesis. The purpose of the study is to examine and identify factors that affect knowledge sharing in EEU. Would you please help me by completing this questions and telling me about your knowledge sharing awareness, practice, information communication technology, organizational and nature of the knowledge related factors that facilitate or hinder knowledge sharing in EEU.

The questions should only take about 25-30 minutes of your time. Your answers are anonymous, DO NOT put your name on the paper given to you. All answer will be kept confidential. Only group results will be presented or documented, not individual answers. Your help with this research is strictly voluntary. So, I will collect the completed paper from you on time of completion, maximum one week. Finally, the results of this study will be presented publicly at Addis Ababa University.

If you have questions or concerns, please contact me at (+251) 911410821. viazf2309@gmail.com.

Thank you for your time and consideration!

Sincerely,

Raey Zewdie Tirfie

Student Researcher

General Direction: It is structured questionnaire consisting of ten pages for the investigation of factors affecting knowledge sharing in Ethiopian Electric Utility. EEU Head Office and another four branches (Regions) in Addis Ababa. Providing a complete and definite answer for each question is important.

Part I: Demographic Profile of this research participant

Please put tick mark (√) on the given boxes or write in the space provided when appropriate.

1. Please indicate your gender?

Male ☐ Female ☐

2. Your age group?

23-28 year ☐ 29-34 year ☐ 35-40 year ☐

41-46 year ☐ 47-52 year ☐ >52year ☐

3. Please indicate your highest educational level?

First Degree ☐ Master's Degree ☐ Doctorate Degree ☐

4. Working department?

Distribution ☐ Energy Management ☐
Engineering Design and Localization ☐ Finance and Controls ☐
Human Resources and PGS ☐ Communications ☐
ICT Department ☐ EHS, Quality and PE ☐
Enforcement ☐ Technical Audit ☐
Other Specify_____

5. Work experiences EEU?

2-5 Year ☐ **6-10** Year ☐ **11-15** Year ☐

16-20 Year ☐ **21-25** Year ☐ **>25** Year ☐

Part II: Knowledge sharing Practice and Constructs

Knowledge sharing includes exchanging and transferring of ideas, information, and suggestions among employees keeping the quality and timeliness of that knowledge and delivering to the right person for use. Given this brief description of knowledge sharing, please put on tick mark (√) that represents your most appropriate answer.

1. At the start of your employment, how did you become familiar with your job? You can choose more than one when you get it appropriate

Via training only	☐	Training + Documented materials	☐
Via documented materials only	☐	Via self-study only	☐
Via self-study + Training	☐	Via self-study + Documented materials	☐
Via self-study + Colleagues	☐	Others Specify_____	

2. How long did it take you to be familiar with your job?

< 3 months	☐	3 months	☐	6 months	☐
7-9 Months	☐	10-12 Months	☐	>1 year	☐

3. What organizational Knowledge Sharing mechanisms (established and endorsed by EEU) do you use to share knowledge? (Choose more than one answer when you get it appropriate)

<u>Electronic-Based Mechanisms</u>:

E-mail	☐	Web Portal	☐	Groupware	☐	Social Media	☐
Knowledge base	☐	Webinar	☐	Video Conference	☐	Tele Conference	☐

Other Specify_____

<u>Face to face or in person Mechanisms</u>:

Discussion forum	☐	Meeting	☐	Training	☐	Symposium	☐
Workshop	☐	Seminar	☐	Conference	☐	Mentorship	☐

Other Specify_____

4. How important are the following incentives for you in order to improve your knowledge-sharing attitude?

	Please indicate the extent to which you agree or disagree with the following statements by putting a tick (√) mark in the appropriate box.	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
4.1	Monetary incentives (salary increment, extra time payment etc.)					
4.2	Career development					
4.3	Promotion					
4.4	Gaining status as expert					
4.5	Acknowledgement of your contribution					
4.6	Less complex and less centralized organizational structure					
4.7	ICT tools that are simple and easy to use					
4.8	Getting further Education or advanced training opportunity					

Part III: Knowledge sharing Factors

	Please indicate the extent to which you agree or disagree with the following statements by putting a tick (√) mark in the appropriate box	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
Individual Factors						
Awareness						
1	I am aware of the importance of knowledge sharing in daily work					
2	Knowledge sharing helps not to repeat the same mistake					
3	I believe I would gain new ideas, technologies, skills or techniques by sharing knowledge					
4	I believe knowledge sharing helps to learn faster					
5	My colleagues know that sharing knowledge increases the productivity of their organization and customer satisfaction					

	Please indicate the extent to which you agree or disagree with the following statements by putting a tick (√) mark in the appropriate box	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Trust						
1	I trust knowledge of my co-workers due to accuracy and credibility					
2	My colleagues feel very confident on my skill and knowledge or capability					
3	Employees share knowledge without the fear that his/her knowledge is being misused by taking unjust credit or bad intention					
Personality						
1	I am an extrovert type of person (like to know what is happening, socialize and open minded)					
2	I enjoy helping colleagues by sharing my knowledge					
3	I am confident in my ability to provide knowledge that others in my organization consider valuable one					
4	Employees in my organization do not share knowledge because they think knowledge is power					
5	I would rather cooperate with colleague than compete with them					
Job Satisfaction						
1	In my organization employees are happy with their daily work					
2	I often share knowledge with my colleagues in EEU					
Organizational Factors						
Reward and Recognition						
1	In my organization individuals who share their knowledge gets rewards and recognition					
2	In my organization I get bonus, promotion in return to my knowledge sharing with colleague					

	Please indicate the extent to which you agree or disagree with the following statements by putting a tick (√) mark in the appropriate box	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Organizational Structure						
1	The organizational structure in EEU is flexible and adoptable for changing-environment to share knowledge easily					
2	The EEU organizational structure emphasize on parallel relations (not hierarchical) rather than vertical ones formality so that conducive to share knowledge					
3	The EEU organizational structure is not static one which is recognized by characters such as less complexity and centralization that facilitates knowledge Sharing					
Organizational Culture						
1	My organization encourages new idea and focus on learning from failure					
2	My organization consults team members to make decision and solve problem					
3	My organization encourages group interaction (team work) regarding knowledge sharing					
4	In the EEU, there is periodic meetings in which people working in different teams, department may participate					
5	There is informal (spontaneous hallway meetings or over a cup of coffee) knowledge sharing practice within EEU					
Office Layout						
1	The physical design of my office layout is open which can facilitate knowledge sharing in the EEU easily. *Open office means workers are seated in partitions to communicate with EEU staffs fast and easily					
2	Physical work environment and layout of work areas not restrict effective knowledge sharing in my organization, EEU					
Work Process						
1	Knowledge Sharing is integrated or included into daily work process (processes and procedures involved when doing a particular job) of my organization, EEU					
2	There is a system put in place to identify the colleagues with whom I need to share my knowledge					

	Please indicate the extent to which you agree or disagree with the following statements by putting a tick (√) mark in the appropriate box	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Information Communication Technology Factors						
ICT Infrastructure						
1	Up to date physical Information Communication Technology and infrastructure (internet, intranet) are available in the EEU					
2	ICT systems and processes are put in place in my organization to share knowledge.					
ICT Know-how						
1	EEU employees have sufficient know-how or literacy on using ICT systems implemented for knowledge sharing					
2	In the EEU, employees use knowledge networks such as (email, intranet, internet and other ICT systems) to communicate and share knowledge with colleagues					
3	Employees make extensive use of electronic storage (such as databases) to access knowledge					
ICT Tools Types						
1	Information Communication Technology tools implemented in EEU are suitable to share knowledge					
2	My organization has user-friendly information technology systems which support employees to sharing knowledge easily					
3	Information Communication Technology tools implemented in EEU is useful to share knowledge					
Nature of Knowledge Factors						
Complexity and Tacitness						
1	The knowledge in EEU is complicated to understand and transfer to others since a number of interdependent routines, individuals, technologies and resources are linked each other-complex in nature					
2	The knowledge in EEU resides in individual mind is sticky to convert or articulate verbally or written form in to documents or other forms of explicit knowledge-tacitness					

	Please indicate the extent to which you agree or disagree with the following statements by putting a tick (√) mark in the appropriate box	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Knowledge Sharing						
1	In my organization knowledge sharing is a component of performance evaluation					
2	In my organization knowledge sharing is highly valued					
3	My organization, EEU, retains highly skilled experienced staffs' tacit knowledge before they leave the organization					
4	My organization has comprehensive motivational scheme to motivate knowledge sharing practice among employees					
5	My organization has knowledge repository that employees use to accomplish their daily office activities					
6	Employees in EEU often share knowledge with their colleagues					
7	Employees in EEU are motivated to share knowledge to their colleagues					

If you have any comment, please specify

_____
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Thank you so much for your cooperation and precious time!

ANNEX III: INTERVIEW QUESTIONS

Interview guideline to assess factors affecting Intra-organization knowledge sharing in EEU.

1. Do you have know-how about knowledge sharing?
2. What do you think about the importance of knowledge sharing among employees?
3. Does your organization support the culture of knowledge sharing?
4. How do the new employees become familiar with the organization's job?
5. Is there any knowledge sharing mechanism that the employees use to share their knowledge among each other?
6. Is there any motivational scheme for the employees that share knowledge with their colleagues?
7. How do you explain the availability of information technology infrastructure or communication tools in the organization?
8. What type of ICT tools or services EEU uses to execute its organizational task?
9. What is the structure of the organization? organic (structures which are relatively flexible and adoptable for turbulent and high-changing environment and emphasize on parallel relations rather than vertical ones), mechanic (structures which are recognized by traits such as high complexity and formality as well as centralization)?
10. Why do you outsource part of your major business processes or activities?
11. Why do you rehire EEU's retired staffs?
12. How do you retain staffs' tacit knowledge before they leave the EEU?
13. What are the possible factors that affect knowledge sharing in the organization? From individual perspective, organizational perspective or technology or nature of knowledge?
14. What actions should the organization take or plans strategies to improve knowledge sharing among its employees and knowledge retention?

ANNEX IV: THE RESEARCHER'S OBSERVATION CHECKLISTS

1. Department Name_____

2. The types of work performed

   _____
   _____
   _____
   _____
   _____
   _____

3. Availability programs/ schedule and places for discussion or meeting on electric service related gaps and challenges.

   Yes ☐ No ☐

4. Office design, whether it is comfortable for knowledge sharing among colleagues or not.

   Yes ☐ No ☐

5. Availability of communication tools such computer, internet, intranet mobile phone, fixed phone and others.

   Yes ☐ No ☐

6. Availability of knowledge artifacts such as:

   Printed as well as electronic materials; Yes ☐ No ☐

   Magazines: Yes ☐ No ☐

   Brochures: Yes ☐ No ☐

ANNEX V- KNOWLEDGE SHARING FRAMEWORK EVALUATION CHECKLIST

1. Do you think that the knowledge-sharing framework is useful to implement knowledge sharing and retention strategies in your organization?
2. Do you think that the knowledge sharing can provide the required knowledge at the required quality and time?
3. Do you think that the knowledge-sharing framework can expedite the knowledge sharing in EEU?
4. Do you think the way in which the knowledge going to be shared is helpful to create new knowledge?
5. What challenge do you think the knowledge sharing framework face to use it? Any modification needed.
6. Is the knowledge sharing Framework understandable? Any modification needed.