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Andrew Wabwezi

The Role of Knowledge Sharing in Fostering Innovation in Higher Education: A Case Study of Tallinn University

Supervisor: Sirje Virkus

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DECLARATION

I certify that all material in this dissertation which is not my own work has been identified and that no material is included for which a degree has previously been conferred upon me.

.....Andrew Wabwezi..... (Signature of candidate)

Submitted electronically and unsigned

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ABSTRACT

The system of higher education is undergoing heightened evaluation and reform in a number of countries. These reforms have included embracing knowledge sharing to improve organizational performance. Realizing that in this era, innovation would be counted as being part of organization success for the higher education sector, this study was aimed at investigating whether higher education institutes have taken knowledge sharing on board for its own sake or for the sake of fostering innovation to maximize competitive advantage.

This study was guided by the interpretivist theoretical perspective and therefore followed a qualitative approach. The case study method was employed in order to profoundly understand the phenomenon of knowledge sharing and how it fosters innovation in a public university. In-depth interviews were used as the principle data collection technique alongside observation and document analysis. Snowball sampling was used for obtaining the sample for the study, whereby each participant pointed to the next potential interviewee as the study progressed. Sampling was terminated when no new information was obtained via new interviewees. This happened after the researcher had interviewed 15 interviewees. The constant comparative method of analysis was used for analyzing the data. The formation of categories was done basing on raw data as illustrated in the grounded theory of Glaser and Strauss.

The findings show that staff at Tallinn University share knowledge but also acknowledged that they can do better. According to the results, staff not only share knowledge with colleagues at the university, but also with colleagues from other universities and professionals in the private sector. The results also revealed that they shared knowledge in different ways which included face to face communication, using digital tools and by use of non digital tools. Most interviewees' perceived innovation mainly as something new that never existed before but also as something that has been redesigned or modified from its original state. The results showed that innovations in form of products are as important as innovation in form of processes. The findings further revealed that innovation is easily achieved when people of different professional backgrounds share knowledge. The findings show that knowledge sharing does not stop at contributing to the realization of innovation but also continues after the innovation is achieved to effect its implementation or adoption. The findings also highlighted the factors that affect knowledge sharing at the university and these included organizational culture, incentives for innovation, availability of social meeting places commitment from management and sensitization.

Keywords: knowledge sharing, higher education, innovation, case study, Tallinn University

Table of Contents

CHAPTER 1: INTRODUCTION	1
1.1 Background	1
1.2 Research Problem.....	3
1.3 Research Aim, Objectives and Questions	4
1.4 Significance of the Study	4
1.5 Methodology	5
1.6 Definitions.....	5
1.7 Delimitation and Scope	6
1.8 Outline of the Thesis	6
1.9 Conclusion.....	7
CHAPTER 2: LITERATURE REVIEW	8
2.1 Introduction.....	8
2.2 Knowledge	9
2.3 Knowledge Management.....	11
2.4 Knowledge Sharing.....	13
2.4.1 Factors Influencing Knowledge Sharing.....	17
2.5 Knowledge Sharing and Knowledge Management in Higher Education.....	32
2.6 Innovation	39
2.7 Innovation in Higher Education	41
2.8 Previous Research on the Influence of Knowledge Sharing on Innovation.....	44
2.9 Conclusion.....	46
CHAPTER 3: METHODOLOGY	48
3.1 Introduction.....	48
3.2 Research Paradigm.....	48
3.3 Methodology	49
3.4 Method	50
3.5 Research Design.....	52
3.6 Credibility	52
3.7 Sampling	53
3.8 Data Collection Techniques	54
3.8.1 Interviews.....	54

3.8.2 Observation	56
3.8.3 Document Analysis	57
3.9 Limitations	57
3.10 Ethical Considerations.....	58
3.11 Data Analysis	58
3.12 Conclusion.....	60
CHAPTER 4: DATA ANALYSIS AND DISCUSSION.....	61
4.1 Introduction.....	61
4.2 Institutional Background Information	61
4.2.1 Knowledge Transfer Center of Tallinn University.....	62
4.2.1.1 Some of the Success Stories Registered by the Knowledge Transfer Center	63
4.2.2 Enterprise Estonia	65
4.2.3 Center for Educational Technology	65
4.3 Interviews, Observations and Document Analysis.....	66
4.4 Perception of Innovation	66
4.5 How Staff at Tallinn University Share Knowledge.....	68
4.5.1 Meetings.....	68
4.5.2 Informal Knowledge Sharing	69
4.5.3 Seminars, Workshops and Conferences	70
4.5.4 Daily Basis in Office.....	70
4.5.5 Collaborative Writing of Research Papers and Research Grant Proposals	71
4.5.6 Team Work and Networking.....	71
4.5.7 Dissemination.....	72
4.5.8 Knowledge Sharing with Other Universities.....	72
4.5.9 Knowledge Sharing with People outside One's Realm.....	73
4.6 Knowledge Sharing Tools Used by Staff.....	73
4.6.1 Web Blogs (LeContract)	74
4.6.2 Mendeley	75
4.6.3 Wikis (Trac)	76
4.6.4 White Boards.....	76
4.6.5 Flickr	77
4.6.6 Card Sorting	77

4.6.7 Concept Maps.....	77
4.6.8 E-mail and Webmail.....	78
4.6.9 Social Networks (Facebook and Twitter).....	78
4.6.10 Skype.....	79
4.7 Less Knowledge Sharing Across Departments	80
4.8 Using Face to Face Communication Vs Technology Tools for Knowledge Sharing	81
4.9 How Knowledge Sharing Contributes to Innovation	82
4.9.1 Does Knowledge Sharing Contribute to Innovation?.....	82
4.9.2 Sharing Knowledge as Soon as One Acquires it to Achieve Innovation	83
4.9.3 How Knowledge Sharing Precedes Innovation	84
4.9.4 Multi-disciplinary Players for Cross Fertilization of Ideas	85
4.9.5 Knowledge Sharing Should Proceed Innovation As Well	86
4.10 Factors Influencing Knowledge Sharing.....	87
4.10.1 Incentives	87
4.10.2 Vertical and Horizontal Communication	87
4.10.3 Commitment from Management	88
4.10.4 Social Meeting Places	89
4.10.5 Organizational Culture	90
4.10.6 Sensitization	92
4.10.7 Policy on Open Access.....	93
4.11 Discussion and Relationships to the Literature	93
4.11.1 Perception of Innovation by Staff at Tallinn University	94
4.11.2 How Staff at the University Share Knowledge	95
4.11.3 Using Face to Face Vs Technology Tools for Knowledge Sharing	96
4.11.4 How Knowledge Sharing Contributes to Innovation	97
4.11.5 Factors Influencing Knowledge Sharing at Tallinn University.....	98
4.11.5.1 Organizational Culture	99
4.11.5.2 Incentives	99
4.11.5.3 Social Meeting Places	100
4.11.5.4 Commitment from Management	100
4.11.5.5 Sensitization	101
4.12 Conclusion.....	101

CHAPTER 5: CONCLUSION AND RECOMMENDATION	103
5.1 Conclusions about Research Questions.....	103
5.2 Perception of Innovation	103
5.3 How Knowledge is Shared.....	104
5.4 Contribution of Knowledge Sharing to Innovation.....	105
5.5 Factors affecting Knowledge Sharing	106
5.5.1 Organizational Culture	107
5.5.2 Incentives	107
5.5.3 Social Meeting Places	107
5.5.4 Commitment from Management	108
5.5.5 Sensitization	108
5.6 Conclusion about the Research Problem.....	108
5.7 Implications for Theory and Practice	109
5.8 Limitations	110
5.9 Direction for Further Research.....	110
5.10 Conclusion.....	111
REFERENCES.....	113
APPENDICES.....	126
Appendix 1: Interview Guide	126

LIST OF ABBREVIATIONS

CET:	Centre for Educational Technology
EU:	European Union
IT:	Information Technology
KM:	Knowledge Management
KS:	Knowledge Sharing
R & D:	Research and Development

CHAPTER 1: INTRODUCTION

This chapter outlines the purpose of conducting the research. It begins by shading light on the background of the study and thereby highlighting the research problem. The research aims, objectives, research questions, the significance of the study and methodology used in the study are then discussed, followed by the definitions and the delimitation of the research project. Finally, an outline of the broad structure of the thesis is given.

1.1 Background

During the 19th century, invention was seen as the product of genius, wayward, uncontrollable, often amateurish or if not genius, then of accident (Myers, 1996). Myers further points out that people later began to realize that actually innovation could be organized and prepared for as was evident towards the beginning of the 20th century when many little clubs or coterie of leading minds in science and literary works were formed especially in England. The groups were formed to be friendly and scientific at the same time. The members were to exchange views with each other on topics relating to literature, arts and science each contributing his quota of entertainment and instruction (Myers). What these groups were involved in was in essence knowledge sharing (KS) where each individual had something to contribute towards the invention of something new.

In this century, organizations are looking for all possible means to stimulate innovation. KS could simply be one of the means to achieve the desired innovation. Since the early 1990s knowledge management (KM) has become a hot issue. The topic of KS has been explored by various researchers in the exclusive context of the business world. Most of these studies have been focused on the growing corps of engineers, scientists, medical doctors, software designers and other creative thinkers to build a learning environment that will meet the needs of the post industrial information economy (Krogh, Ichijo, & Nonaka, 2000).

For organizations, most of the KS initiatives have been designed to create competitive advantage. Myers (1996) points out that apart from monopolistic policies and other market irregularities, there is no sustainable advantage other than what a firm knows, how it can

utilize what it knows, and how fast it can learn and develop something new. The new thing is what leads to innovation after knowledge creation, and KS have taken place in an organization. KS creates opportunities to maximize organizational ability to meet those needs, and create solutions which provide business with a competitive advantage (Reid, as cited in Lin, 2007).

Much as competitive advantage is at the forefront of the KM concept in business, there are other factors that have made the subject so popular in the recent years. One of such factors is globalization of the economy as indicated by Myers (1996) that this factor has put enormous pressure on firms for increased adaptability, innovation and process speed. As a consequence, many firms have been making the best of their knowledge, and fostering KS to remain competitive globally. The notion of globalization however, has not only influenced the business world but also other sectors such as higher education. Bloom (2005) concurs, stating that higher education institutions today and in the near future will experience different and intensified extended pressure influenced by globalization as the past few decades have witnessed the pressure on higher education institutions to respond to this global integration. Zeleza (2007) contends that universities have peculiar relationships with globalization because as institutions they see themselves as universal communities of ideas they trade in international currency. He further stresses that universities have been impacted by globalization and are implicated in the discursive framing of globalization in that they have always aspired to be globalised.

Globalization has impacted on higher education in similar ways it has done to the business world. Universities as a consequence are under unprecedented pressure to be more innovative, and create their own competitive advantage. Dodds (2008) points out that the effect of globalization has led higher education institutions to attain an economic role. He further elaborates that higher education institutions have come to collaborate with business to create knowledge based goods. The production of the so called knowledge based goods is what has yielded to innovation. Valimaa and Hoffman (2008) agree that the growing importance of knowledge, research and innovation are changing the social role of universities in the globalised world.

This study is particularly concerned with the notion of innovation at universities and how the universities use KS for its enhancement. Tallinn University which is one of the public universities in Estonia, has had several innovations, some of which have been developed through collaboration between staff, students and the private sector. Some of the innovations were related to the development of software, designing toy products, digital archives, creation of new courses to mention but a few. The university was chosen for the case to find out how KS has contributed to the success of the innovative initiatives. The findings of the study may be transferable to other universities in the same situation as Tallinn University.

1.2 Research Problem

The system of higher education is undergoing heightened evaluation and reform in a number of countries. There are pressures for greater productivity and efficiency, demands for more responsiveness and enhanced application, as well as reforms in the financing of universities (Bleiklie & Powell, 2005). These factors have driven universities to become more entrepreneurial and enterprising not only for income generation but also for enhancing the national competitiveness in innovation and research development in order to prove their worth, attract funding and compete favorably in international ranking exercises (Cranfield & Taylor, 2008).

Before universities can enhance national competitiveness in innovation, they must first of all create their own competitive advantage. The resource-based view adjudicates that the only way to achieve competitive advantage is through the strategic use of scarce, intangible and firm-specific resources that include knowledge (Zack, 1999a, b). Knowledge in this regard has been stressed as the most eminent factor as viewed from the knowledge-based perspective. It is for this reason that the business sector have progressed to equip themselves with the ability of managing knowledge to stand competition strategically, to overcome problems swiftly, and to capitalize on opportunities as they emerge. Similarly, the higher education institutions, just like the private sector, see the dire need to gain competitive edge due to stiff competition and pressure to face globalization (Ramachandran, Chong, & Ismail, 2009).

Liebowitz (2001) points out that some organizations attain competitive advantage by encouraging and promoting KS. Sohail and David (2009) note that KS leads to organizational success. They maintain that for public universities, innovation would be counted as being part of that success. They further contend that the need for KS is even more desired for knowledge intensive organizations such as universities. They acknowledge though that knowledge sharing is not an end in itself but a means to an end.

According to Hawamdeh (2003), the outcome of KS is the creation of new knowledge and innovation that eventually improves organizational performance. The question this study seeks to pose is whether public universities have taken KS on board for the sake of it or for purposes of fostering innovation and gaining competitive advantage.

1.3 Research Aim, Objectives and Questions

The aim of this research is to investigate the role of KS in fostering innovation at Tallinn University. This aim will be realized by fulfilling the following objectives:

- a) To determine the perception of innovation at Tallinn University.
- b) To find out how staff within innovative initiatives share knowledge.
- c) To determine how KS has contributed to the innovation at Tallinn University.

In meeting the above mentioned objectives, the research shall be guided by the following research questions:

- How innovation is perceived at Tallinn University?
- How staff share knowledge within innovative initiatives at Tallinn University?
- How KS would contribute to the success of the innovative initiatives?
- What factors influence KS at Tallinn University?

1.4 Significance of the Study

The study will enable higher education institutions to consider the factors and create conditions that foster KS among staff in order to bolster innovation. Universities that are

struggling to find tenable strategies to foster innovation will find this research useful because it will provide valuable information regarding the role of KS in promoting innovation. This study will also be useful to knowledge managers, chief executive officers, policy makers and researchers in various research institutions who have innovations as one of their main objectives.

1.5 Methodology

The study adopted the qualitative methodology which well suits the aim of collecting in-depth detailed data for exploration of the phenomena under study. The case study method was used with the application of open ended interviews, observations and document analysis as data collection techniques. Snowball sampling was employed whereby each interviewee pointed to the next potential interviewee. The point of saturation was reached after interviewing 15 interviewees. The data was analyzed using the method of constant comparative analysis. While using this method, the inductive approach was maintained during the formation of categories to ensure that the analysis was grounded in the data collected.

1.6 Definitions

In order to provide some form of guideline to the reader, definitions of some key words used in this study have been given as shown below:

Van Den Hooff and De Ridder's (2004, p.119) definition of KS was adopted in this study and according to them, KS is a process where individuals mutually exchange their implicit (tacit) and explicit knowledge to create new knowledge. It should be noted that there are different approaches of sharing tacit knowledge. As pointed out by Gourlay (2006) that "the term 'tacit knowledge' has been applied in three distinct ways: first, where the knowledge in question could be stated (articulable knowledge), second where only feelings to tacit knowledge were claimed, and third where there was evidence of action or behavior of which the actors could not give an account (and the actors' inability is not intentional, nor due to inhibitions about

communicating knowledge” (p.67). This study however, does not seek to dwell so much on philosophies but rather to discuss knowledge sharing and its influence on innovation.

Fostering will be defined according to the Free Online Dictionary, this dictionary defines fostering as to sustain and promote or to encourage or to nature (Fostering, 2003).

West and Farr (1990) defined innovation as “an intentional introduction and application of new products, processes, procedures, or ideas that are designed to significantly benefit the individual, the group, the organization or wider society” (p. 11).

1.7 Delimitation and Scope

Although KS is practiced in most organizations and universities, this study focused on its implementation at Tallinn University which acted as a vehicle for the case.

KS in this context was studied in terms of its influence on innovation at Tallinn University. Despite the fact that KS can influence other areas or be applied in various fields, this study focuses on its contribution to innovation. Tallinn University is a fairly big university with numerous institutes colleges and departments. The researcher could not explore all of them and collect data from each staff member given the limited time that was available for the study. The researcher therefore collected data only from staff members whose names were mentioned during the snowball sampling.

1.8 Outline of the Thesis

The first chapter of this thesis provides the background of the study and the rationale for conducting the research. The research problem, aims, research questions, summary of the methodology, significance, definition of key terms and the delimitation of the study are presented in the same chapter.

Chapter 2 reviews the literature which informed the study. It explores the concept of knowledge, KM, KS, factors affecting KS, KS in higher education, innovation, innovation in higher education and finally previous research conducted on the influence of KS on innovation.

The third chapter outlines the methodology and research paradigm chosen to guide the study and provides a justification for that choice. The research design, sampling method, data collection techniques, credibility and ethical considerations are discussed. The method and criteria of data analysis are also examined.

Chapter 4 presents the data analysis and discussion of findings. This includes institutional background information, analysis of the data, and the discussion that aids in the interpretation of the data as it relates to previous literature.

The final chapter (Chapter 5) presents the conclusions about the findings of this research and discusses theoretical and practical implications of the research. Suggestions for areas of further researcher are also presented.

1.9 Conclusion

This introductory chapter provided background information to this research and discussed the initial motivation for the project. The research problem was presented and the research questions outlined. The methodology was briefly described and definitions and limitations as they apply to this study were addressed. An overview of how this thesis will progress was also provided. The following chapter reviews the literature as it pertains to this study.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter discusses works by previous researchers that are related to the subject under investigation. The chapter is set out in seven sections. First, an overview of the definition of the term knowledge and the types of knowledge as set out by previous researchers is presented. Secondly the debates surrounding the concept of KM and the main activities that define it are discussed. This is followed by the concept of KS and how it has been defined. The different categories of KS as suggested by previous researchers are then presented. This section is further divided into factors affecting KS. Next, KS and KM in higher education are discussed. This is followed by innovation as a concept and how it has been defined by previous scholars. Innovation in higher education is then discussed. Lastly, an overview of previous literature about the influence of KS on innovation is presented.

Literature searches were conducted in Emerald database, EBSCOhost database and JSTOR database all of which were accessed via the electronic resources of Oslo University College, and Tallinn University electronic resources. The World Wide Web including Google Scholar was also searched. The key terms used for searching included “knowledge sharing”, “knowledge sharing and higher education”, “Innovation”, “Innovation in higher education”, “knowledge management”, “knowledge management and higher education”, “factors affecting knowledge sharing” and “Knowledge”. The researcher first of all used the simple search option before embarking on the advanced search option for each search session that was conducted. The results of the search sessions were checked for relevance to the search terms by first of all checking the topic and then the abstract. Whenever a relevant article was identified, it was immediately downloaded and saved in a folder bearing the subject of the article for future reference. This literature review was also informed by both electronic books from the World Wide Web, Google Books and hard copy text books whose subject matter was related to the subject under investigation. Most of the hard copy text books used were identified by searching the online public access catalogue of Tallinn University and thereafter physically collecting the hard copy from the Academic Library of the university.

The literature searches that were conducted yielded few results about KS and innovation in the higher education sector. In some cases the search results from different databases produced the same authors with the same articles but limited in number. This indicates that comprehensive research in the area of knowledge sharing and innovation in higher education is limited. The search through different journal databases indicates that more research about KS and innovation has been conducted in the business sector than has been done in the higher education domain. This study aims to fill the research gap in the literature by focusing on examining the role of KS on innovation in higher education.

2.2 Knowledge

The value of knowledge is not debatable but to benefit from it, requires a fuller understanding of what it is, and how it works (Duffy, 1999). Knowledge has often been used synonymously with information though some studies show the existence of a fine line between the two concepts. Duffy suggests that knowledge is information that has been enriched by the user of the information. He goes on to say that knowledge is a combination of insights, judgments, and innovation. Cook and Brown (1999) contend that innovation is the result of a generative dance between knowledge and knowing.

To make the distinction explicit, some scholars have tried to illustrate the distinction between knowledge and information by first of all distinguishing data from information. Bailey and Clark (2000) elaborated that data becomes information when they are put in context and information becomes knowledge when it becomes of interest to potential users at a particular time. They further conclude that information only becomes knowledge when it is interpreted meaningfully in relation to the situation and users. Indeed, users' experiences in given situations coupled with the information they acquired prior about same or similar situations, may constitute what they know. Miller and Morris (1999) concur, stating that knowledge is gained when information and experience are integrated. Nonaka and Takeuchi (1995, p.15) defined knowledge as "a dynamic human process justifying personal belief towards the truth". Small and Sage (2006) elucidate that belief is critical to this concept of knowledge because it is closely connected with individuals' or groups' values and beliefs. They further claim that knowledge from this perspective originates from the minds and bodies of individuals.

On the other hand some scholars like Wilson (2002), claim that knowledge is what we know and can only exist in our minds and anything we communicate or disseminate from our minds is information. In other words, Wilson argues that knowledge cannot exist anywhere else except in our minds. The study of the knowledge in one's mind is what led Polanyi (1966) who has been heralded as the father of tacit knowledge, to suggest that what we know is more than what we are able to articulate. According to Nonaka (1991), knowledge has been classified into tacit and explicit knowledge. Dalkir (2005) clarifies that tacit knowledge is not easy to articulate and therefore difficult to put into words, texts or drawings. In contrast he explains that explicit knowledge is manifested in form of content that has been captured in some tangible form such as words, audio recordings or images. He further elaborates that whereas tacit knowledge tends to reside in the minds of the knower, explicit knowledge is usually in form of tangible or concrete media. This makes explicit knowledge easier to share via products, services or documented processes while face to face communication is a better medium for sharing of tacit knowledge.

It has been claimed that tacit knowledge is acquired through an individual's direct experience for example, on job training and informal learning at work (Herbig, Bussing, & Ewertt, 2001; Marchant & Robinson, 1999). Gourlay (2006) contends that tacit knowledge is both an individual and collective type of knowledge. He explains that individuals acquire it through experience although it is also innate. The presence of others is generally regarded as essential for its acquisition. It has also been claimed by Gourlay that tacit knowledge facilitates routine behaviors but is simultaneously a source of innovation if not knowledge more generally. Alwis and Hartman (2008) seem to agree with this notion when they say that there is the beginning of a realization that tacit knowledge is critical to the key organizational tasks of creating new knowledge, generating new products and improving new business procedures leading to innovation. Kikoski and Kikoski (2004) portray explicit knowledge as what can be embodied in a code or language and because of this it can be verbalized, communicated, processed, transmitted and stored relatively easily. Although for a few scholars like Horvath et al. (1999), one hardly acquires tacit knowledge from other people, the majority of scholars seem to agree that person to person contacts and observation of others are important in the

acquisition of tacit knowledge (Leonard & Sensipe, 1998; Collins, 2001). The debate on what really constitutes knowledge can prove to be a long one but probably the controversy surrounding KM has attracted even more curiosity from researchers and scholars as shown in the following section.

2.3 Knowledge Management

Some scholars have reasoned that knowledge can't be managed but it can be enabled (Krogh et al., 2000). Others have even claimed that knowledge management is a concoction promoted by consultants to keep themselves in business. This notion is emphasized by Wilson (2002) when he suggests that KM was a formulation of the consultancy companies to continue reaping businesses after the waning of re-engineering. This conjecture is contested by Prusak (2001) noting that while the idea of consultants looking for a profitable new subject to replace an expiring one may hold water, the fact is that KM is not just a consultant's invention but a practitioner based, substantive response to real social and economic trends. Organizations today are in a quest of finding out what they know, who knows it and how to make the best use of it.

All these assertions about KM by the aforementioned scholars may be made, and whether they are true or contestable, there should be a definition for the subject of discussion. There have been several definitions of KM depending on what scholars have chosen to associate it with. Pohs (2001, p. 2) defined it as "a discipline that systematically leverages content and expertise to provides innovation, responsiveness, competency and efficiency". This definition ties the knowledge resources to content and expertise which may be regarded as resources embedded in the knowledge that is leveraged for other benefits as mentioned above. Peter Drucker's definition also emphasized knowledge resources and their exploitation in organizational pursuance of other benefits. According to him, KM "is the coordination and exploitation of organization's knowledge resources in order to create benefits and competitive advantage" (Drucker, as cited in Perseus Publishing, 2002, p. 543).

Although as claimed by Wiig (1997), that knowledge has been managed implicitly as long as work has been performed in an organization, Dalkir (2005, p. 3) associates his definition with intentionality when he defines KM as “the deliberate and systematic coordination of an organization’s people, technology, processes and organizational structure in order to add value through re-use and innovation”. This coordination is achieved through feeding the valuable lessons learned and best practices into co-operate memory in order to foster continuous organizational learning. Organizational learning is part of the aims of KM. Perhaps this explains why Call (2005) simply put it that successful KM gives you access to the information you need to do your job, better than you did in the past. He further elaborates that KM does not provide you with the answer to your problems rather it facilitates the learning of the answer. The facilitation of learning to effect KM is also implied by O’Dell and Grayson (1998) stating that KM is 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. Implementation of KM is done in different ways depending on the model that may be adopted by the implementing organization.

There are various KM models whose distinguishing factor lies in their points of emphasis during implementation (Kakabadse, Kakabadse, & Kouzim, 2003). For example while the cognitive model focuses on repetitive action, replication and standardization or routinization of knowledge and its replication (Swan & Newell, 2000), the network model is considered to be characterized by horizontal patterns of exchange, interdependent flow of resources and reciprocal lines of communication (Powell, 1990). While commenting on the network perspective of KM, Kakabadse et al. elaborate that this perspective emerges parallel with the themes of the network organization and focuses on acquisition, sharing and knowledge transfer.

Some KM studies focus almost entirely upon information technology tools whereas others focus on KM as a transdisciplinary subject with major behavioral as well as technical concerns (Small & Sage, 2006). Some of the strategies that generally define KM in an organization are briefly explained below (Sohail & Daudi, 2009; Adhikari, 2010).

Knowledge acquisition: Obtaining new knowledge for an organization impacts on its future and this may be done by acquiring knowledge from outside the organization, hiring experts, licensing patents and creating knowledge within the organization through formal research activities (Sohail & Daudi, 2009, p. 129; Adhikari, 2010, p. 97).

Knowledge sharing: This is mostly practiced by sharing experiences through, exchanging ideas, observations, imitations, apprenticeships, workshops, seminars, and other socialization practices (Sohail & Daudi, 2009, p. 129).

Knowledge retention and dissemination: The aim of knowledge retention strategy is to maintain the knowledge base of the organization. Given that the knowledge is a contributing factor to the performance of the organization, it must be maintained at the point of exploitation. It also involves conversion of tacit to explicit knowledge for example, where one writes a report about what they learned in a workshop (Adhikari, 2010, p. 97).

Knowledge exploitation: This is what yields into sustainable competitive advantage because the exploitation of the knowledge gained is an economic justification for existence of any type of organization (Adhikari, 2010, p.97).

All the above mentioned strategies are always designed for the bottom line benefits of the organizations in which they occur (Adhikari, 2010). Although it is quite often implemented as one of the strategies of KM as shown above, KS is critical to the creation of knowledge and organizational performance (Small & Sage, 2006). Results from a qualitative study by Mason and Pauleen (2003) demonstrated that sharing was the single most important factor in KM implementation. The following section gives a deeper insight into the subject of KS.

2.4 Knowledge Sharing

KS may be defined in various ways depending on the context in which it is considered. Van Den Hooff and De Ridder's (2004) conceptualization of KS portrays it as a "process where

individuals mutually exchange their implicit (tacit) and explicit knowledge to create new knowledge” (p.119). According to De Vrie, Van Den Hooff and De Ridder (2006), this definition implies that every KS behavior consists of both the supply of new knowledge and the demand for new knowledge. In line with Van Den Hooff and De Ridder’s stance, De Vrie et al. describe two central behaviors of KS as follows: (a) “Knowledge donating, as communicating one’s personal intellectual capital to others and (b) Knowledge collecting, as consulting others to get them to share their intellectual capital” (p.116). They maintain that both behaviors as distinguished above are active processes either actively communicating to others what one knows or actively consulting others to learn what they know. They elucidate that both behaviors have a different nature and can be expected to be differentially influenced by different factors.

Haas and Hansen (2007) claim that KS has been shown to improve individual and organization performance and innovativeness. They add that KS is a practice that has become increasingly important to organizations as most organizations are now considered to operate in a knowledge economy. KS in an organization not only occurs at the individual level but also at the collective level (Obembe, 2010). Obembe further states that an organization’s capacity for KS is crucial as a factor in the ability to generate new knowledge as well as its ability to utilize the resources and capabilities of its members.

In their book about enabling knowledge creation, Krogh et al. (2000) praise the power of KS and give an example of how one person’s comments about a difficulty of using the internet for instance, may lead to an extended group discussion that results in a new concept for a user friendly interface. They urge that the original owner of the idea matters less as long as “the community members provide the energy for an evolutionary process in which loosely formulated ideas turn into concepts, concepts are justified and turned into prototype and these ultimately turn into innovative products and services” (p.126). In other words KS affects not only tacit knowledge but all phases of the knowledge creating process. Nonaka and Takeuchi (1995) discuss a theory of knowledge creation that consists of four knowledge conversion phases: socialization (tacit to tacit), externalization (tacit to explicit), combination (explicit to explicit) and internalization (explicit to tacit). They point out that the conversion phase takes

place in five steps: sharing tacit knowledge, creating concepts, justifying concepts, building archetypes and cross leveling. According to the authors, KS primarily occurs during the socialization, externalization and the combination phases. They add that the importance of sharing in the creation of knowledge is captured in the concept of redundancy. Nonaka (1991) defines redundancy as “the conscious overlapping of company information, business activities and managerial responsibilities” (p.102). He cites an example of the Canon Company in Japan where product development teams are organized according to the principle of internal competition. He elaborates that a team is divided into competing groups that develop different approaches to the same project and argue over the advantages and the disadvantages of their proposals. He points out that this encourages the team to look at a project from a variety of perspectives. Under the guidance of a team leader the team eventually develops a common understanding of the best approach.

According to Nonaka (1991), redundancy is important because it encourages frequent dialogue and communication. He further adds that it helps create a common cognitive ground among employees and thus facilitates the sharing of tacit knowledge. He points out that since members of the organization share overlapping information they can sense what others are struggling to articulate. Redundancy also spreads new explicit knowledge through the organization so that it can be internalized by employees.

Formal knowledge sharing

Taminiau, Smit, and De Lange (2007) present two forms of KS which include formal KS and informal KS .While elaborating on the former the authors contend that formal KS comprises all the forms of KS that are institutionalized by management. The authors add that these are resources, services and activities, which are designed by the company or organized with the aim of KS or of learning from each other (organizational learning). According to Nonaka (1994), formal exchange mechanisms, such as procedures, a formal language, and the exchange of handbooks will ensure that people will exchange and combine their explicit knowledge. Taminiau et al. (2007) list other examples of formal KS as meetings and organized brainstorm sessions. The authors assert that a culture, which makes sure that explicit knowledge is shared, does not preclude the sharing of implicit knowledge.

Informal knowledge sharing

Werr and Sjernberg (2003) highlight the need for informal KS and the importance of experiences. Literature links Informal KS to informal networks and informal communication (Awazu, 2004; Bresnen, 2003). There seems to be an overlap between informal KS, informal communication and the conceptualization of an informal network (Taminiau et al., 2007). McEvily & Reagans (2003) claim that business relations between colleagues, and friendship relationships (close ties) between the members, will enlarge the possibility of knowledge exchange. Krogh et al. (2000) state that trust and openness in the business culture are preconditions for KS. Sturdy, Schwarz and Spicer (2006) describe the importance of informal settings such as lunches, drinks and dinners. The authors contend that such informal meetings have proven to facilitate smooth knowledge exchange also between consultants and their clients.

Swap, Leonard, Shields and Abrams (2001) suggest that often inter-organizational knowledge is shared unconsciously by employees, incorporation having unconsciously taken place through informal interaction. This implies that the sharing of knowledge can also take place even where there is no the specific intention to do so. Truran (1998) suggests that intra-organizational communication has changed tremendously. He states that half of the KS is taking place through informal channels (“ad hoc channels”) for example through telephones or mails. Krogh et al. (2000) also found that the greater part of KS takes place informally, even in organizations in which KS is highly institutionalized.

In their research Werr and Sjernberg (2003) described experience of colleagues as an important source of knowledge especially during formulation of more creative ideas. It is also pointed out that sharing of experiences also took place in more informal arenas, such as spontaneous hallway meetings or over a cup of coffee. The experience gained by individuals in their practice was shared among colleagues as stories about concrete cases. This knowledge was a large extent tacit, but transformed in part into articulate knowledge through the process of sharing. “Extension of experimental knowledge to organizational level was a question of

creating arenas for interaction between consultants possessing, as well as needing, this type of knowledge” (Werr & Sjernberg, 2003, p. 894).

Taminiau et al. (2007, p. 45) defined informal KS as “all forms of KS which exist alongside all the institutionalized forms of KS”. According to the authors, it relates to resources, services and activities, which are used to facilitate KS, but are not necessary, designed for that purpose. They list as examples of informal KS, conversations and exchange of ideas at the coffee machine, dinners, lunches and when commuting together to work or to a client.

2.4.1 Factors Influencing Knowledge Sharing

Several studies have been carried out to determine the factors that influence KS by different scholars. Ives, Torrey and Gordon (2003) describe KS as a human behavior that should be examined in the context of human performance. Human performance is described as a complex activity that is influenced by many factors. They describe a human performance model which includes business context, organizational and individual factors. Organizational performance factors include: structure, roles, processes, physical environment, and culture. They assert that the individual factors include direction, measurements, means, ability and motivation. These factors are interrelated and each contributes to the success of KS but can only be effective if considered collectively. These factors are further elaborated as described here below:

Business context: They point out that employees are more likely to share knowledge if the KS behavior is linked to business goals. They add that employees will share knowledge if it is linked with the common goal of the organization. These authors emphasize the need for business strategy to be communicated to employees. They claim that it is not enough to make sure that the KM system is simply aligned with the business strategy for KS to occur. They indicate that it is important that the business strategy is communicated to employees such that a consensus of support is created (Ives et al., 2003, p. 3).

Organizational structure and role: According to the authors, supporting KS is encouraged by means of a two-part organizational structure which involves dedicated KM staff who run the knowledge processes, templates and technologies and the sponsors and integrators from the business units who own the knowledge content. The KM staff are sometimes referred to as knowledge champions. These people attain the role of change agents in an organization (Ives et al., 2003, p. 4).

Organization processes: The authors suggest that in order to create an atmosphere in which KS is likely to occur, it needs to be built into the daily work processes. If KS is a normal and expected part of the job then it is likely to be done. They claim that it is also important that everybody knows where and how to contribute to knowledge and what happens after their contribution is made (Ives et al., 2003, p. 6).

Organizational Culture: The authors stress the importance of organizational culture to KS but also emphasize the importance of understanding the cultural difference between individual workers. They point out that in a hierarchical organization where employees are competing for a decreasing number of positions, KS is less likely to occur. In a relatively flat organization that centers around functional or project teams, sharing is more likely to occur because personal knowledge may be seen as critical to promotion. Trust and integrity on the part of leaders will help to unlock employees' resistance to share. Once trust is established KS needs to be part of everything in the organization. They point out that steps to achieving a KS culture include: setting KS priorities, strong KS leadership, modeling by senior leadership (i.e. visible advocacy of KS behavior) and KS investment support (Ives et al., 2003, p. 8).

Physical environment: The authors claim that many organizations are beginning to recognize the need to create environments for KS, for example: quiet spaces, informal environments, relaxed physical environments enhanced with technologies that are appropriate for KS. The authors point out that physical environments shouldn't be taken for granted as individuals need a quiet space where they can reflect and input contribution. They claim that much KS occurs without the use of technology. Some of it is not occurs without prior planning. The sharing of best practice can occur in the coffee room or by the copy machine. However, many

organizations are employing team spaces and scheduled team KS meetings to allow for these exchanges (Ives et al., 2003, p. 10).

The authors cite an example of a study that was conducted in 1998, that showed that most employees thought they gained most of their work related knowledge from informal conversations and not from procedure manuals or formal training (Wensley, as cited in Ives et al., 2003). They assert that a number of organizations are creating spaces specifically designed to foster more informal sharing of knowledge. They cite an example of the London Business School that created an attractive space between two major departments to increase KS between these formerly detached departments. The authors also give an example of Reuter's News Service known for its excellent internal KS. They note that Reuters installed kitchens on each floor to encourage interaction and KS. They claim that their own firm had created several sites such as the financial ideas exchange in New York and the Smart Store in Chicago designed to promote innovation and KS. They infer that technology can enhance the utility of these spaces for example network connection in these rooms can facilitate access to the KM system and the increased ability to immediately input insights gained from these discussions so others can have access to them (Ives et al., 2003, p. 11).

Direction: The authors infer that given that KS is a new behavior to many organizations, guidance is needed to achieve enhanced value. Guidance is needed in terms of the contextual awareness, abstraction of what to share, when to share, how to share, why to share and whom to share with. Guidance of this kind given in the context of daily work processes is especially useful to knowledge sharing (Ives et al., 2003, p. 13).

Measurement: They contend that human performance measurement is becoming increasingly more important as knowledge based organizations begin to recognize that the organization's greatest resource is composed of its people. A description of how the KS proficiency has been established and measured at the authors company is given. KS expectations are communicated and translated into actions that can be documented in a performance review. Individual and team KS metrics provide definition to KS behavior and communicate that the organization places a value on it. They further suggest that documenting the mission impact (outcome

metrics) is important to obtaining and keeping senior leadership support (Ives et al., 2003, p. 14).

Means: They reason that effective organizational KS cannot be realized without information technology. The existing infrastructure (internet, e-mail, intranet, and groupware and web technology) can be extended to support KS processes. Video conferencing, application sharing and electronic meeting support are KS enablers. Many organizations focus on the information technology (IT) component because it is the most tangible however, it is important to provide the means to accomplish this within the context of the various organizational performances attributes (Ives et al., 2003, p. 16).

Ability: They advise that KS behavior within a corporate environment needs continuous support and training. They state that it is important to integrate KS training within the entire array of training initiatives. Knowledge workers need training prior to job performance, knowledge support during job execution, and time to reflect on lessons learned to improve individual learning and contribute to organizational learning (Ives et al., 2003, p. 18).

Motivation: They deduce that there are individual and cultural differences that drive KS behavior. KS is best supported by intrinsic rewards (for example: saving work time, participating in useful and interesting dialogue or professional pride in being recognized as an expert). External rewards should be selected carefully because what motivates in one organization may be a barrier in another. The importance of employee care and trust is also emphasized. KS motivation factors include: being a normal part of the job, being related to career growth, receiving thanks and recognition, knowing how others used their contribution and knowing it is expected behavior (Ives et al., 2003, p. 20).

Basing on a review of literature, Peariasamy and Mansor (2008) list four factors that influence KS in an organization. They elaborated the factors as described below:

Openness: They point out that openness is to do with a person's openness in terms of willingness to share knowledge and partner interaction. Openness explains the partner's

willingness to put all cards on table, eliminating hidden agendas, revealing their motives, feelings, making their biases known and inviting other opinions and points of view (Peariasamy & Mansor, 2008, p. 89).

Channel of interaction: They list e-mail, computer conferences, telephone and face to face interactions as some of the most important channels of KS (Peariasamy & Mansor, 2008, p. 89).

Trust: They assert that trust is an important facilitator in communication, creates good communication and enables one to be more willing to engage in KS. “Trust is developed upon a reliable person who is honest and can be counted on after a long term relationship” (Peariasamy & Mansor, 2008, p. 89). Ives et al. (2001) concur, stating that KS is a human behavior that can’t be fostered without genuine trust and care. Krogh et al. (2000) support this view stating that tacit KS among individual participants thrives well in an atmosphere of high trust. They add that “open ended conversations in which members learn to trust each other and have established a caring atmosphere, generate new concepts” (p. 129).

Prior experience: They state that prior experience supports effective KS between partners when prior knowledge is used in exploring new knowledge in the organization (Peariasamy & Mansor, 2008, p. 89).

Using the survey method and the questionnaire as the data collection technique, Han and Anantatmula (2007) carried out an empirical study targeting two information technology services and consulting organizations in the United States. The study was conducted to examine cultural, technological and motivational factors that influence KS within an organization from the perspective of non-executive employees.

The results showed that issues related to availability and usability of technology, leadership support and motivating structures have influence on KS. The study also revealed that employees’ willingness to share knowledge was not affected by their concerns about the loss of power or job insecurity (Han & Anantatmula, 2007, p. 431).

The study showed that the following factors impacted on KS as described below:

Organizational factor: The results showed that organizational factors were an important component to employees' willingness to share knowledge. The organizational factor construct was based on an organizational culture and employees trust among other things. The researchers based their evidence of the organization factor on the fact that majority of the employees indicated that they were aware of the emphasis and practice of KS in the organization. The results showed that both organizations were very much willing to invest in new technology to promote KS (Han & Anantamula, 2007, p. 430). Tohidinia and Mosakhani (2010) concur, stating that organizational culture has a positive impact on K.S in an organization.

Technology: The findings showed that the availability of advanced technology does not mean that the employees will use the technology to share knowledge. However, if the technology is easy to use and sufficient training is provided, employees may be persuaded and encouraged to use the available technology to share their knowledge (Han & Anantatmula, 2007, p. 431). This factor is supported by Tohidinia and Mosakhani (2010) stating that IT has a significant impact on KS behavior in an organization. Hinds and Pfeffer (2003) are however, skeptical about the role of technology in facilitating KS. According to them, expertise or knowledge is largely tacit and embedded in the context in which it is being used. They claim that systems that purport to capture expertise for later perusal by those in need often fall short of the goal. They urge that it is difficult to absorb knowledge from such a system. They claim that experts find it difficult to articulate their knowledge in such a way that it can be loaded into an information system for later use.

Leadership: The findings showed that most of the interviewees indicated that their managers were willing to share knowledge with them. The data showed that management facilitates KS through allocation of resources to support the sharing of knowledge. The study findings implied that leadership that encourages KS would allocate resources to support KS in other words the leadership would support their employees by allocating paid hours and funds for training courses, conference attendance and purchase of technology to support KS. The study

also showed that encouragement, verbal praise and social support were contributing motivational factors for KS among employees (Han & Anantatmula, 2007, p. 432).

It is also worth noting that the study above demonstrated that the loss of personal power as well as job security were not obstacles to KS among employees. The results indicated that employees were willing to share knowledge without the feeling of losing power of their job. Trust and level of interaction with co-workers was however, found to influence KS (Han & Anantatmula, 2007, p. 431).

Regarding the loss of power and job insecurity, the afore-mentioned findings contrast with research results of Chaudhry (2005) on KS practices that were based on review of literature of various studies done about KS in institutions in Singapore. His study revealed that career advancement and performance appraisals created a mentality of fear called “*Kiasuism*” (afraid to lose mentality) that discourages employees from sharing knowledge in organizations in Singapore. He explains that most people who hoard their knowledge are almost fearful of losing their jobs or feel insecure. He elaborates further that many purposefully refuse to document procedures and information about certain tasks because they do not want to lose their knowledge power to others. His study shows that there is a general belief that people are reluctant to share knowledge because they are afraid of losing their exclusiveness (Chaudhry, 2005, p. 6). The disparity in the two studies about power and job insecurity could be attributed to the different cultural contexts in which the studies were conducted.

Basing on literature review, Cummings (2003) classified the factors affecting knowledge internalization and consequently KS into 4 broad categories:

- relational context;
- knowledge context;
- recipient context;
- source context and
- environmental context (Cummings, 2003, pp. 9-31).

The factors above were elaborated on as shown below:

Relational Context

It is pointed out that the relational context includes those factors that create different types of distance between the parties. These are described as organizational distance between the units based on the governance mode and the distance between the source and the recipient in terms of physical location, Institutional setting, Knowledge competence and their Relationship (Cummings, 2003, p.10).

Organization Distance

It is indicated that research on organizational distance suggests that the strength of social ties, free flow of communication, consistency in administration controls and level of trust between the source and recipient will be greater to the degree that the units interact through defined and structured organizational arrangements rather than through ad-hoc processes. Studies have shown that parties embedded within a network (McEvily & Zaheer, 1999; Uzzi, 1996; Burns & Wholey, 1993) are able to share knowledge more effectively among members than with outsiders. A key argument underlying much of this literature is that being embedded with a network enhances denseness of social ties (Tichy, Tushman, & Frombrun, as cited in Cummings, 2003, p.10).

Physical Distance

Assertion was made that physical distance between parties can affect the difficulties, time requirements and expenses of meeting face to face and communicating. Dutton and Starbuck (1979) found that face to face meetings and conferences were more effective way of KS than the exchanges of documents, manuals, and correspondences. Davenport and Prusak (1998, p. 99) noted that sometimes KS can only work if the various parties are brought to gather physically. The underlying logic is that parties draw upon social capital embedded within the group relationships to facilitate KS (Cummings, 2003, p.12).

Allen's (1977) empirical study demonstrated that communication between research and development (R&D) employees decreased markedly with increased physical distance. One exception to this conclusion was found in Darr's (1994) study of KS in pizza franchise where

strategic similarity mediated the relationship between geographical distance and KS success. Even with great physical distances between them, since all the franchising faced similar operating dynamics, they shared a common sense of purpose that allowed exchanging strategic knowledge within difficulty. This implies that physical distance can have an impact on KS although where the parties share a common sense of purpose the impact may be less (Cummings, 2003, p.12).

Knowledge Distance

It is claimed that knowledge distance refers to how large a gap exists between the source and the recipient in terms of their knowledge bases. Hamel (1991, p. 97) found that organizational learning was enhanced when the knowledge gap between a source and a recipient was not so great to make the recipient unable to identify if not retrace, the intermediate learning steps between its present competence level and that of its partners. Lane and Lubatkin (1998) found that a recipient that has a large knowledge gap between it and the source would be less likely to assimilate the source's knowledge. In other words, an organization's absorptive capacity, although the focus of numerous knowledge related studies (Dixon, 2000; Lyles & Jalk, 1996; Baughn, Denekamp, Stevens, & Osborn, 1997), is not the appropriate concept to address the issue of the ability of an organization to absorb knowledge. Rather it is the relative knowledge of the recipient with respect to the source's knowledge. This is also consistent with the discussion of Dinur, Inkpen & Hamilton (1998) with respect to the need for two parties to have some alignment in terms of knowledge to facilitate KS. Nonaka and Takeuchi (1995) also emphasize the need for the overlapping areas of expertise to facilitate KS. As Nelson and Winter (1998) noted the same knowledge apparently is more tacit for some people than for others depending upon how much knowledge overlap exists.

On the whole, whether it is too little a knowledge overlap between the parties or too extensive a knowledge base on the part of the recipient relative to the knowledge to be shared, the knowledge distance between the parties can affect the ability of the recipient to internalize shared knowledge (Cummings, 2003, p. 15).

Relationship Distance

It is inferred that relationship distance refers to the duration and quality of the experience that the source and recipient have in working together. The argument is that as parties to KS arrangement work together, they develop social bonds that allow them to better access the tacit knowledge that may only become accessible (Dixon, 1994) through the use of the experiential interactions between the parties (Hansen, 1999). Trust, which is “a warranted belief that someone else will honor their obligation” (Casson, 1997, p. 118) is needed in situations where the complexity of the relationship or the fact that it is marked by unanticipated contingencies prevents the parties from having the ability to find recourse if things should not go as planned (Lazaric & Lorenz, 1998).

On the overall basis, each of these relational factors can be seen as potentially affecting KS processes. The evidence seems to point to the need to develop friendly relationships between the parties so as to bridge any distance between them (Cummings, 2003, p.17).

In his study of KM in universities, Rooney (2000) concurs with Cumming, describing the relational context as a set of relationships in which the knower is situated. He further elaborates that the relational context is important for developing a social perspective of knowledge because it makes us sensitive to the fact that knowledge is highly dependent on communication in socially and culturally contextualized relationships for its diffusion acquisition, creation and value (Rooney, 2000, p. 11).

Knowledge Context

According to Cummings (2003), the knowledge context includes two aspects of knowledge which are explicitness and embeddedness. These have been described as shown below:

Knowledge explicitness

Knowledge explicitness is referred to as the extent to which knowledge is verbalized, written, drawn or otherwise articulated. As mentioned in section 2.2, highly tacit knowledge is hard to articulate, is acquired through experience and thus, a primary distinction with respect to knowledge is between its explicitness and its tacitness. At the same time, Polanyi (as cited in

Cummings, 2003, p. 21) states that, “While tacit knowledge can be possessed by itself, explicit knowledge must rely on being tacitly understood and applied. Hence all knowledge is either tacit or rooted in tacit knowledge.” Inkpen and Dinur (1998) argued that the distinction between tacit and explicit knowledge is not a dichotomy, but a spectrum or continuum with extremes of the two types at either end. At the explicit end of the continuum, knowledge is codified in specific products and processes; at the tacit end, knowledge resides in individual cognition and organizational routines all developed through experience and use (Cummings, 2003, p. 21).

According to Cummings (2003), the logic behind identifying the explicitness vs. tacitness of knowledge is that explicit knowledge is seen as more easily transferable than tacit knowledge. However, organizational learning theories tell us that the sending of a fully explicit development manual to a client does not necessarily result in the contents and meanings of that manual being internalized by the client. On the contrary, such a complete codification of knowledge as would be contained in a manual could instead effectively preclude a recipient from localizing or taking ownership of the knowledge, since the knowledge could be so predefined to limit its adaptability. For example, the work of Nonaka (1994), Dixon (1994), and Yeung, Ulrich, Nason and von Glinow (1999) in general suggest that organizational learning occurs through a process along the lines of:

- Tacit knowledge – knowledge held in someone’s head – is accessed from internal and external boundary crossing interactions;
- Accessible knowledge is translated and re-categorized to allow members to make sense of it, to see where it fits within their focused area and overall within the organization;
- Tacit knowledge is made explicit through dialogues;
- Knowledge is put into action to allow its conversion from explicit to tacit by ‘learning by doing.’ While these activities do not necessarily proceed in this order, the extent to which each does occur is likely to have an influence on knowledge-sharing success (Cummings, 2003, p. 22).

This organizational learning process suggests that by participating in articulation processes, recipients might be able to have better opportunities to translate and re-categorize the given

knowledge, which in turn could allow them to see how it fits within their own area, organizations, as well as participate in the dialogues through which much of the meaning behind the tacit components of the knowledge can become evident (Nonaka, 1994). In other words, a recipient's early participation is akin to their helping to create a presentation rather than only being in the audience that receives one. All that would be omitted from the final presentation, as well as the rationales for everything included and excluded, can only be learned if the recipient is involved in the presentation's creation (Cummings, 2003, p. 22).

Thus, explicitness is potentially a two-edged sword. On the one hand, the existence of casual ambiguity with respect to a package of knowledge to be shared suggests that efforts to codify or articulate the knowledge could enhance its transferability. Intel's "copy exactly" policy for building semiconductor plants (Iansiti, 1998) follows such a philosophy. On the other hand, too much reliance upon codification might limit a knowledge package's internalization, as a seemingly complete codification could ignore the reality that tacit elements still exist (Polanyi, 1966). For example, research on the use of information and communication technologies to bring internationally dispersed teams together found that, while the technologies were effective at facilitating the sharing of codified knowledge, they could not transfer related sensory information, feelings, intuition, and non-verbal communications that were important to the knowledge's ultimate implementation (Boutellier, Grassmann, Macho & Roux, as cited in Cummings, 2003, p. 23).

Knowledge embeddedness

The second aspect of knowledge that has been emphasized in the literature is embeddedness. The concept of knowledge embeddedness is consistent with the notion of knowledge complexity (Dixon, 2000). The issue to be considered is how many knowledge elements and related sub-networks (e.g., people, tools, and routines) will need to be shared, absorbed, adapted and adopted by the recipient. In many situations, a significant component of an organization's knowledge is embedded in people (Starbuck, 1992). At its simplest, the sharing of people-embedded knowledge would require only the movement of people between units, since they would carry the knowledge with them. Alternatively, people-embedded knowledge

can also be shared by extracting their tacit knowledge through some series of knowledge sharing activities (Cummings, 2003, p. 23).

According to Argote and Ingram (2000), knowledge can also be embedded in a complex mix of multiple elements and sub networks. The people-routines network contains knowledge about who is good at what tasks. It is this knowledge that the recipients of routine-embedded knowledge will need in order to figure out how to reconfigure and adapt the original knowledge. While a routine may be easy to transfer, knowledge about who is good at using that routine may take time to develop. In response to this very issue, many organizations have attempted to codify who-knows-what in their organizations through the development of directories of expertise or knowledge yellow pages (Davenport & Prusak, 1998; Yeung et al., 1999; Dixon, 2000), so that they may access the organization's intellectual capital (Stewart, 1997). Knowledge about which tools best support which routines (held in the tools-routines network) is also important with respect to the effectiveness and the efficiency of the reconfiguration and adaptation process. As Teece (2000, p. 36) noted, since organizational knowledge is embedded in processes, procedures, routines and structures, "Such knowledge cannot be moved into an organization without the transfer of clusters of individuals with established patterns of working together." Kogut and Zander (1992, p. 383) made a similar argument:

because we know that hiring new workers is not the equivalent to changing the skills of a firm, an analysis of what firms can do must understand knowledge as embedded in the organizing principles by which people cooperate within the organizations.

The capabilities of the firm in general are argued to rest in the organizing principles by which relationships among individuals, within and between groups, and among organizations are structured (Cummings, 2003, p. 25).

Recipient Context

The one variable emphasized in the literature as specifically within the recipient context is its learning culture (Davenport & Prusak, 1998), learning capability (Yeung et al., 1999) or fertility (Szulanski, 1996). The need for a culture of learning in an organization to facilitate organizational learning in general, and knowledge internalization, has been emphasized by

various researchers (Aubrey & Cohen, 1995; Wick & Leon, 1993; Davenport & Prusak, 1998). In an organization that fosters delegating responsibility, tolerating creative mistakes, and providing slack time to work on new ideas, the richness of the knowledge shared is likely to be much higher (Davenport & Prusak, 1998).

On the other hand, if learning is not considered important, the slack required to enable people to think and discuss, and for learning groups to emerge, may be sacrificed in the name of efficiency (Stewart, 1996). Moreover, even when knowledge is shared with a willing recipient, the sharing will only be effective when the knowledge is retained (Glaser, Abelson, & Garrison, 1983). As Szulanski (1996) noted, knowledge retention cannot be taken for granted, given the evidence from research on innovations (e.g., Rogers, 1983) and planned organizational change (see e.g., Glaser et al., 1983). In addition, even if retained, the knowledge may not be nurtured and further developed. Szulanski (1996, p. 32) termed organizational environments as ‘fertile’ or ‘barren’ depending on the extent to which they facilitated the development of transferred knowledge or hindered the “gestation and evolution” of this knowledge (Cummings, 2003, p. 28).

Taken together, the literature on learning culture posits that organizations with extensive sets of routines and competencies designed to retain and nurture shared knowledge are better able to support knowledge internalization than less fertile organizations (Yeung et al., 1999). Lacking the ability to invest significant time or other resources in new knowledge due to a barren organizational learning environment, a recipient may be simply incapable of developing the necessary degree of commitment and ownership toward the new knowledge to allow for its full internalization. Moreover, since a recipient’s ability to retain and nurture transferred knowledge interacts with its motivation to do so (Vroom, Porter, & Lawler; Campbell; as cited in Cummings, 2003), having a fertile organizational environment can provide an offset to mitigate any potential low motivation on the part of the recipient. Thus, the literature concludes that a recipient’s capability with respect to accepting, retaining and nurturing new knowledge are an important factor affecting the success of knowledge sharing efforts (Cummings, 2003, p. 29).

Source Context

Yeung et al. (1999) suggests that a source's learning culture is also an important factor affecting knowledge sharing success. This is because a capable source is able to manage knowledge-sharing activities in a way that improves a recipient's learning of the specific knowledge, much as a university professor structures lectures, readings and assignments to best facilitate their students' learning. In addition, a capable source may also be able to help a recipient overcome some of the many of what Yeung et al. term 'learning disabilities.' For one, by engaging the recipient through an administrative structure that allows for a greater degree of autonomy for the recipient than it might generally have, the recipient may become more adaptive and flexible (Weick, 1979), and this in turn, can allow it to pursue the types of varied experience-based learning opportunities that can move it along its learning curve (Westney, 1988; Epple, Argote, & Devadas, 1991).

A second way that a capable source can assist a less capable recipient is to help remove some of the perceptual 'blind spots' that can lead it to fail to consider the decisions of others in its own decisions (Zajac & Bazerman, 1991). Similarly, as research has shown that an organization's existing stocks of resources and capabilities can limit and channel its ability to develop these and other resources, thereby also affecting its decision-making (Teece, Pisano, & Shuen, 1997). The source can introduce new resources that can help the recipient avoid becoming too constrained or developing learning myopia (Levinthal & March, 1993).

In addition, two other recipient variables can also affect transfer success. These variables include the credibility of the source with the recipient (Arrow, 1971) and the strategic intent of the source to complete the transfer (Hamel, 1991). As described, knowledge internalization requires that a recipient recognises the value of the knowledge being shared. If the source is seen as less than credible, then its knowledge may also lose value in the eyes of the recipient, thereby affecting the outcomes of the sharing processes (Cummings, 2003, p.30).

Environmental Context

It is claimed that entrepreneurial, learning and innovation environments in which knowledge sharing takes place can affect the parties and knowledge-sharing processes in many ways (Kim & Nelson, 2000). For example, organizations in rapidly changing technological environments have been found to pursue fewer site visits, benchmarking studies, and direct forms of communication than those in more stable industries (Appleyard, 1996; Von Hippel, 1988).

In the strategic management literature, both organization-level and environment-level variables are seen as affecting organizational performance, and it is through the strategies adopted by organizations that the two sets of variables are joined (Andrews, 1971; Barney, 1991). With respect to the knowledge sharing arena, what this literature suggests is that the broad economic, cultural, political and institutional environmental variables need to be examined to determine the extent to which they play a role in affecting the micro-context variables. In other words, a complete examination of the factors that can create distances between the parties (relational context), make knowledge assessment and analysis more challenging (knowledge context), or have an effect on the motivations and intents of the parties (source and recipient contexts), requires consideration of the broader environment in which the two parties conduct their KS (Cummings, 2003, p.31).

2.5 Knowledge Sharing and Knowledge Management in Higher Education

As we enter the 21st century, higher education institutions face a world that is more interconnected, one in which knowledge, creativity and innovation are essential elements of thriving societies (Birgeneau, 2005). Higher education institutions need to be consciously and explicitly managing the processes associated with the creation of their knowledge assets, and to recognize the value of their intellectual capital to their continuing role in society, and in a wider global marketplace for higher education (Rowley, 2010). Petrides and Nodine (2003) concur stating, that higher education institutions serve as reservoir of knowledge and are no

longer just providing knowledge to students. The authors point out that information practices and learning strategies known as knowledge management, are gaining acceptances in the field of education. These institutions manage, blend, and share knowledge among the faculty staff themselves. Thus, KS is inevitably challenging and an important concept in higher education institutions. This is evident by the fact that several higher education institutions, particularly in the developed world have been receiving grants to implement knowledge management practices (Sohail & Daud, 2009). Swart and Kinnie (2003) point out that the need for KS is even more required for knowledge intensive organizations like public universities. The authors assert that such organizations need to share knowledge held by employees if they are to gain the most from their intellectual capital and compete effectively in the global market place.

Using the survey method Sohail and Daudi (2009) carried out a study about KS in higher education institutions. The results showed that nature of knowledge, working culture, staff attitude, motivation to share and opportunities to share play an important role in KS in public universities. The presence of culture among the factors shows that knowledge sharing does not only depend on technology alone. Steyn (2004) contends that in order to harness the power of knowledge in higher education, management should give an equal emphasis on people, technology and structures. The results further showed that sharing could be enhanced if the university administration plays a positive role by encouraging their staff to share knowledge through open discussions, forums, seminar and colloquiums (Sohail & Daudi, 2009, p. 138).

In his study of KM in academic institutions, Adhikari (2010) identified 5 major pre-requisites that should be undertaken while implementing KM in academic institutions. Most of these initiatives would qualify to support KS. The pre-requisites include:

I. Map the knowledge flows at the educational institution: According to the author, identifying the prevailing state of knowledge flow shows very clearly which part of the institution suffers from a lack of knowledge flow and these can then be highlighted for attention. It is necessary to examine the prevailing level of connection between faculties, staff, students and institutions.

II. Identifying the source of expertise at the institution: He points out that it is essential to map the stocks of knowledge and use them to push the sharing of best practice. This can be done by examining performance.

III. Investigating who needs knowledge at the institution: He suggests that it is important to focus on mission critical rather than nice to have knowledge practices. If core faculties need some specific skills to enhance their class performance skills, it is better to carry out the training.

IV. Make the knowledge visible: He advises that there should be easy access to knowledge for the institutional members' manuals, instructions, catalogues, notices, computer facilities and database help in making knowledge visible. Visible knowledge can easily be transferred around an organization. All departments can use such knowledge for planning and making decisions.

V. Develop policy to institutionalize KM initiatives: According to him, it is necessary to facilitate knowledge growth through culture and incentives. Such growth of knowledge provides soft form of incentives to reinforce KM initiatives at the institution. Incentives help reinforce best practices and at the same time to instill a shift in behavior. He asserts that incentives should be based on annual performance review of faculties and staff on the basis of their contribution to the institution's knowledge (Adhikari, 2010, p. 102).

In the same study, Adhikari (2010) noted that KM initiatives are required for educational institutions and these are elaborated as shown below:

1. Teaching and learning environment: He notes that the creation and dissemination of knowledge is practically not possible without a harmonious teaching and learning environment. He maintains that there should be incentives for commitment for those who have been engaged in teaching activities. Students have to be aware of the benefits that are possible from a sound teaching learning environment.

2. Research activities: He claims that although a number of research institutions are functioning within the university framework, it seems less collaborative and less knowledge based. He goes on further to suggest that there should be a system of transferring research knowledge and skills within different research institutions.

3. Technology based knowledge: He points out that technology helps to create and process the knowledge in a required form. He stresses that technology is now an effective media for disseminating and sharing knowledge.

4. Knowledge based networking: He notes that it is hardly possible to create store and disseminate knowledge without networking activities within and outside the university system. A networking hub is essential to foster social relations among business communities, government ministries and non government organizations (Adhikari, 2010, p.100).

Adhikari (2010) also notes problems or difficulties in the implementation of KM initiatives in the future as explained below:

1. Institutional culture: He states that culture is a crucial aspect for facilitating KS, learning and creating knowledge. An open institutional culture is required with incentives to promote integrating individual skills and experiences into institutional knowledge.

2. Recognition of the institution's strength that already exists: He claims that many institutions are not able to recognize that they are having abundant strength of knowledge to utilize formally and informally. He cites an example of some institutions whose organizational structure is designed in such a way that knowledge exchange takes place between those who most need it.

3. The mentality that technology is the main part of KM: He points out those KM activities that are not only supported by technology. He lists social relations, networking and interaction as the main elements for implementing KM practices at educational institutions. Information technology is never a substitute for these elements. Therefore a good fit between information technology and social relations is required.

4. Focusing on recycling old knowledge rather than generating the new one: He claims that most of the institutions are inward looking. They focus more on old knowledge rather than on creation of new knowledge. He notes that much more important, over the long term, is the ability to ring new knowledge into the institution, and turn it into new model of teaching and learning.

5. The reluctance to change habits: He infers that without changing prevailing habits it is difficult to implement KM initiatives. More time and efforts should be devoted to the process of socialization and internalization of knowledge. Staff should be willing to improve their skills in using emerging technologies (Adhikari, 2010, p. 101).

Using the case study method Cranfield and Taylor (2008) carried out a study about KM and higher education. The case study targeted seven higher education institutions within the United Kingdom. The findings revealed that universities have begun considering KM and have even created positions such as a vice principal, KM. However, the aforementioned authors claim that academic staff are considered as experts in their fields and therefore do not easily yield to being managed. They add that the staff are not averse to the idea of sharing best practice but rightfully so want to exercise their freedom so as to cultivate innovation and creativity (Cranfield & Taylor, 2008, p. 98).

The results also showed that the benefits of explicitly adopting KM principles within the context needs to be clearly understood by individual researchers and academics as well as administrators. As universities consider themselves to already be sharing, creating and disseminating knowledge, they need clear explanation of what areas will improve with the adoption of KM (Cranfield & Taylor, 2008, p. 98).

The results further revealed that the management structure of a university affects its ability to respond quickly to external influences and pressures. The study showed that universities have become more and more decentralized shifting budget and hence power down to the heads of schools or colleges. The impact of this is that colleges /faculties and hence the heads or deans

become all powerful which tends to weaken the center from implementing systematic or institutional wide change without the express approval and finances from deans (Cranfield & Taylor, 2008, p. 98).

In their study about applying corporate KM practices in higher education, Kidwell, Linde, and Johnson (2000) pose a question of whether the concepts of KM as applied in the cooperate sector are applicable in universities and colleges. They add that some would argue that sharing knowledge is their raison d'être. If this be the case, they ponder, the higher education sector would be replete with examples of institutions that leverage knowledge to spur innovation, improve customer service or achieve operational excellence. They however, observe that although some examples exist, they are the exception rather than the rule. KM is a new field and the experiments are just beginning in higher education. They point out that using KM tools techniques and technologies in higher education is as vital as it is in the corporate sector , if done effectively , it can lead to better decision making capabilities , reduced product development cycle time (for example , curriculum development and research), improved academic and administrative services and reduced costs. They cite examples of potential sources of knowledge in a university or college that would be beneficial if shared with other staff. The sources include:

- A faculty member who has led a successful curriculum revision task force.
- A department secretary who knows how to navigate the complex proposal development or procurement process.
- A researcher who has informal connections to national research funding bodies.
- A special assistant to the rector/president who has uncovered or generated useful reports that individual deans or departments could use to develop their own strategic plans (Kidwell et al., 2001, p. 31).

They claim that relying on the institutional knowledge of unique individuals can hamper the flexibility and responsiveness of any organization. They add that the challenge is to convert the information that resides in those individuals and make it widely and easily available to any faculty member, staff member or other constituents. They contend that an institution wide

approach to KM can lead to exponential improvements in sharing both explicit and tacit knowledge and the subsequent surge benefits (Kidwell et al., 2001, p. 31).

They list areas in which KM is applicable in universities and colleges as elaborated here below:

The research process: They contend that in this context KM can be implemented by building a repository of the following:

- Research interests within an institution or at affiliated institutions.
- Research results and where possible funding organizations.
- Commercial opportunities for research results (Kidwell et al., 2001, p. 32).

Curriculum development: They claim that KM activities in this area can include building a repository of the following:

- Curriculum revision efforts.
- Content modularized and arranged to facilitate interdisciplinary curriculum design and development.
- Pedagogy and assessment techniques (Kidwell et al., 2001, p. 32).

Alumni services: They suggest that KM activities in the context should include building a portal for:

- Career placement services.
- For student services, that serves both students and staff so that the staff are well informed in order to advise students.
- For alumni development services (Kidwell et al., 2001, p. 32).

Administrative services: The authors advise that KM activities in this area should include setting up a portal for financial services, procurement and human resources. They state that these should include frequently asked questions (FAQs), best practice, procedures, templates and communities of interest (Kidwell et al., 2001, p. 33).

Strategic planning: They state that KM activities in this area should include building a portal of:

- Internal information that catalogs strategic plans, reports developed for external audiences.
- External information including benchmarking, studies, environmental scans and competitor data.
- Data related to accountability and outcome tracking by monitoring assessment, performance indicators and bench marking (Kidwell et al., 2001, p. 33).

2.6 Innovation

Innovation is defined in many different ways in the literature. According to Chen et al. (2004), innovation refers to the introduction of a new combination of the essential factors of production into the production system. Plessis (2007) contends that innovation capital is “the competence of organizing and implementing research and development, bringing forth the new technology and the new product to meet the demands of customers” (p.21). She adds that it involves the new product, the new technology, the new market, the new material and the new combination. Cardinal et al. (2001) indicate that the innovation process encompasses the technical, physical, and knowledge-based activities that are central in forming product development routines. Amabile et al. (1996) define innovation as the successful implementation of creative ideas within the organization.

Some authors have linked innovation to commercial products and services. For example Herkema (2003) defines innovation as a knowledge process aimed at creating new knowledge geared towards the development of commercial and viable solutions. The same author also defines innovation with emphasis of novelty as the basis for describing the term. He notes that innovation is “the adoption of an idea or behavior that is new to the organization” (p. 341). This is in agreement with White and Glickman (2007) who point out that the term innovation may simply refer to the introduction of a new idea, method or device. A more comprehensive definition is provided by West and Farr (1990). These authors defined innovation as an “intentional introduction and application of new products, processes, procedures, or ideas that

are designed to significantly benefit the individual, the group, the organization or wider society” (p. 11). This definition is important because it distinguishes innovation from creativity in as much as innovation involves the “intentional introduction and application of new and improved ways of doing things” (Anderson et al., 2004, p. 148).

Gloet and Terziovski (2004) contend that innovation can broadly be described as the implementation of discoveries and interventions and the process by which new outcomes, whether products, systems or processes, come into being. The same authors related innovation to change, which can be radical or incremental. The authors distinguish between radical and incremental innovation. They elucidated that incremental innovations present themselves as line extensions or modifications of existing products. They add that they are usually classified as market-pull innovations. They urge that incremental innovation does not require significant departure from existing business practices and are therefore likely to enhance existing internal competencies by providing the opportunity to build on existing know-how.

On the other hand, Gloet and Terziovski (2004) claim that radical innovations are likely to be competence destroying. They add that these kinds of innovations make existing skills and knowledge redundant and require different management practices. They posit that radical innovations often put the business at risk because they are more difficult to commercialize. According to them, radical innovations are considered crucial to long-term success as they involve development and application of new technology, some of which may change existing market structures. Plessis (2007) contends that companies that facilitate both radical and incremental innovation are more successful than organizations that focus on one or the other.

Other authors have analyzed innovation as a combination of invention and exploitation (Kikoski & Kikoski, 2004; Roberts, 1987). It is implied that innovation can be achieved through two distinct strategies, namely exploitation where exploitation is making use of existing opportunities and exploration which involves the search for new ones (Schulze, Heinemann, & Abedin, 2008; Tushman & O’Reilly, 1996; March, 1991). The combination of both exploitation and the exploration strategy has been termed as ambidexterity (He & Wong, 2004; March, 1991). These authors view exploitation in terms of refinement, implementation,

efficiency, production and selection. They describe exploration in terms of search, discovery, experimentation, flexibility, variation, and risk taking.

Plessis (2007) points out that in the fast changing business world of today; innovation has become the main stay of every organization. Adhikari (2010) urges that the global environment has changed so drastically and operation processes of academic institutions have become more volatile and dynamic than ever. This implies a similarity in the surrounding environment for both the business world and academic institutions. If innovation has become the solution to the challenges facing the business world, the field of higher education can also take advantage of the same solution as shown in the following section.

2.7 Innovation in Higher Education

Innovation as perceived in other fields is not significantly different when considered in the field of higher education (White & Glickman, 2007). These authors contend that in the field of higher education innovation can refer simply to “some new way of doing things or a change that improves administrative or scholarly performance or a transformational experience based on a new way of thinking” (p.97).

In their study about innovation in higher education and its implications for the future, White and Glickman (2007) point out that today’s higher education administration are faced with several challenges. Among these challenges is the task of balancing the fiscal pressure of running a large organization influenced by external forces. They claim these pressures include rankings and increased competition for students and faculty and internal stress produced by boards and accrediting agencies who are demanding more transparency, accountability and tangible evidence of success. They advise that meeting such challenges would be best served by seeking continued innovation in curriculum programs, delivery mechanism, support services and operations. They contend that right from the “origination of Plato’s Academy in ancient Greece, to the founding of Oxford University College in 1249 A.D up to the advent of online degree programs in the late twentieth century, the landscape in higher education has been constantly changing. They assert that “while this evolution has led to the expansion of

higher education in industry and advancements in educational aspirations and attainment, ongoing improvements in these dimensions is imperative” (p. 98). Their assertion is consistent with the US Department’s prediction, that this new landscape demands innovation and flexibility (Higher, 2006). White and Glickman (2007) further note that technology is a major driver of innovation in higher education. They add that the flexibility afforded by technologies can facilitate gains in many facets of an institution’s operation, provided that this institution is willing to adopt the technology. They warn that many innovations are bound to meet challenges because of their novel approaches. The Western Governors University in the United States is cited as an example of a case where innovation met stiff resistance. According to authors, the university was born out of the desire to offer access to higher education to an increasing number of students in an era of fixed or even declining state appropriation for colleges and universities. They point out that the competency based model by Western Governors University which was delivered using a wide variety of instructional methods conflicted with traditional accreditation processes including the fundamental tenets of faculty and curriculum development. The authors advise that according to the lessons learned from this example, flexibility is a necessary condition for successful innovation in higher education. They cite curriculum innovation as exhibited by Western Governors University in the United States and the Leadership Foundation for Higher Education in the United Kingdom as a hall mark of innovation and flexibility within the academy. They claim that in addition to program development and curriculum reform, innovation can help institutions meet standards dictated by accrediting agencies and drive changes in the accrediting processes themselves (White & Glickman, 2007, p. 99).

White and Glickman (2007) observe that many higher education institutions in the United States behave like mature enterprises which have become self satisfied and risk averse. They add that risk averse ideas do not lend themselves to trying new ideas or ways of operating. They warn that self satisfaction allows little cause for the reflection that precedes innovation. They also deduce that fiscal pressure may offer easy excuse for the status quo. They contend as suggested by Donofrio (2006), the executive vice president for innovation at IBM, that collaboration of multiple and diverse cultures are needed to break the malaise. He maintains that innovation has to be more multi-disciplinary with collaboration among experts from many

different backgrounds. White and Glickman stress that universities must continually seek ways to innovate and thereby deliver increased productivity through gains in operating efficiencies. They indicate that institutions have sought such improvements in several ways including outsourcing of ancillary services, developing consortia to support a broad variety of academic programs, using technology better and matching inputs and outputs (White & Glickman, 2007, p. 100).

In their study of educational values and innovation, the executive staff of the Educause point out that the boundaries of knowledge are advanced by colleges and investments where learning and research reshape what we do (Educause, 2010). They claim that this is the essence of innovation; to redefine what individuals, organizations, industries and societies can achieve and how they do so. They contend that at its heart, higher education is an enterprise dedicated to driving innovation across all fields of human endeavor. They further state that IT is a catalyst and source of innovation. They indicate that as IT transforms work, learning and society, it also profoundly influences how colleges and universities pursue their mission. They assert that with technology as a prime enabler, innovation in the learning enterprise has increased dramatically “from using web resources in the classroom to developing online hybrid learning to conditioning classes in virtual environments” (Educause, 2010, p.14).

The Educause executives further posit that IT staff in the universities have a significant role to play in innovations in their institutions. This is evidenced by their assertion that being part of the higher education IT community means generating, experiencing, leading and managing innovation on a daily basis. They observe that higher education IT professionals play a central role in harnessing the transformation potential of technology for the good of their institutions and communities these institutions serve. These executives add that the IT professionals monitor development in technology in order to identify and capture the value of IT innovations for their institutions. The executives maintain that in addition to this the IT staff often create and develop innovative technology, uses of technology and processes that capitalize on the best of what technology has to offer in higher education. They also note that higher education IT professionals provide leadership on their campuses by clarifying the role that technology based innovation can play in advancing the institution’s mission and strategic goal (Educause, 2010).

2.8 Previous Research on the Influence of Knowledge Sharing on Innovation

“When markets shift, technologies proliferate, competitors multiply and products become obsolete almost overnight, successful companies are those that consistently create new knowledge, disseminate it widely throughout the organization and quickly embody it in new technology and products” (Nonaka, 1991, p. 96). Nonaka further states that these activities define the knowledge creating company whose sole business is innovation.

The development of innovative products and services has become essential for achieving and retaining competitiveness in global markets (Miron, Erez, & Naveh, 2004). Innovation is crucial for firms seeking to find their place in the market and ensuring long-term survival. In recent years, there has been widespread acceptance among scholars and practitioners that innovation is power for firms and other organizations (Drach-Zahavy, Somech, Granot & Spitzer, 2004). In the literature, one of the two factors considered essential for long term success of the firm involves the related concepts of innovation and knowledge (Capon, Farley, Lehmann & Hulbert, 1992). Knowledge as one of the most important resources of organizations (Nahapiet & Ghoshal, 1998; Grant, 1996), permits novel organizational outcomes including the process of innovation (Smith, Collins, & Clark, 2005; Kogut & Zande, 1996).

There is also increasing evidence that knowledge is a key building block for the innovation process and in particular for innovation management (Darroch & McNaughton, 2002; Nonaka & Takeuchi, 1995). Innovation is closely related to the concept of knowledge creation (Nonaka, 1991; Nonaka & Takeuchi, 1995). Kamasak and Bulutlar (2009) point out that in order to learn new knowledge; individuals should interact and share implicit and explicit knowledge with each other. In this way, individuals improve their capacities to define a situation or problem and apply their knowledge to problem solving (Nonaka et al., 2006). Ambrosini and Bowman (2001) contend that the KS process facilitates knowledge sharing. They maintain that the constant interaction between tacit and explicit knowledge, leads to the development of new and innovative ideas.

Previous research on innovation supports the relationship between effective KM and innovation (Smith et al., 2005; Darroch & McNaughton, 2002; Dougherty, Munir, & Subramaniam, 2002; Hargadon & Sutton, 1997; Nonaka & Takeuchi, 1995). For example Dougherty et al. (2002) argue that innovation relies heavily on the accumulation of new knowledge in an organization, which facilitates creative solutions.

Hargadon and Sutton (1997) contend that sharing of knowledge between groups and individuals in an organization leads to problem solving. They further note that when knowledge is shared among groups within the organization, existing ideas from one group appear novel to another and vice versa, resulting in potentially new products or services. Other authors (Afuah, 2003; Story & Kelly, 2002; Lin, 2001; Tsai, 2001, Drucker, 1985) have articulated the intuitive notion that knowledge is the most essential element in innovation. In their studies, Story and Kelly (2002) found that lack of knowledge is the main barrier to innovation in service firms. In addition, Tsai (2001) notes that new knowledge is critical to developing new products or innovation ideas. Knowledge dissemination and responsiveness to knowledge in other words KS have been put forward as the two most important components impacting upon innovation due to their ambiguous and unique nature within the firm (Teece, 1998; Grant, 1996; Day, 1994). Overall, continuously collecting and integrating new knowledge will lead to innovativeness (Subramania & Youndt, 2005).

Kamasak and Bulutlar (2009) carried out a study to explore the effects of KS on innovation. They used the survey method and the questionnaire data collection technique. The questionnaires were designed to measure the relationship between KS and innovation. Data was collected from 246 middle and top level managers in Turkey and was explored using multiple regression analysis. In this study the researchers focused on two forms of KS namely knowledge donating and knowledge collecting. In particular the effects of knowledge donating and collecting on ambidexterity in organizations are also studied with ambidexterity being regarded as the simultaneous achievement of exploitative and exploratory innovation. The results showed that knowledge collecting had a significant effect on all types of innovation and ambidexterity, whereas knowledge donating, involving donating inside and outside the group, did not have any effect on exploratory innovation. It was also observed that in-group

knowledge donating affected both exploitative innovation and ambidexterity (Kamasak & Bulutlar, 2009, p. 311).

Taminiau et al. (2007) carried out an empirical study about innovation in management consulting firms through informal KS. The study was conducted using in-depth interviews with 29 consultants in the Netherlands. In addition to the interviews that took place with the consultants, meetings were held with three specialists in the field of consultancy and innovation. Additionally one of the authors spent a period of four months as an intern and was therefore capable of making observations on KS between consultants (Taminiau et al., 2007, p. 47).

The findings revealed that the process of innovation can be problematic in consultancy firms. Consultants do simply not find the time to innovate, since they are mainly rewarded for client related work (billable hours). In order to innovate, consultants need to share knowledge with clients, colleague consultants and their experienced superiors. The KS routes the consultant can use, as described in by the researchers are: codified, formal knowledge and informal knowledge sharing. According to the findings, it was concluded that the most fruitful route to innovation is informal KS (Taminiau et al., 2007, p. 52).

2.9 Conclusion

Most of the previous studies that have been included in this literature review left research gaps that this study seeks to fill. Some of the studies reviewed in this chapter were carried out basing entirely on literature review. Examples include studies such as Peariasamy & Mansor, (2008), Ives et al. (2003) and Cummings, (2003). The study of Ives et al. (2003) was also based on the experience of the authors as KM consultants. This could have provided a potential source of bias in their analysis. Despite the fact that some studies were based on empirical evidence (for example, Han & Anantamula, 2007; Kamasak & Bulutlar, 2009), they were conducted using the survey method with the questionnaire as the data collection instrument. The interviewees accounts were therefore limited by pre-coded parameters which formed part of the questions in the questionnaires. As a consequence, the studies could have missed collecting in-depth detailed data that could have been imperative in explaining and

providing further elaboration of the phenomenon under investigation. Moreover, these studies targeted commercial firms and not higher education. Whereas some studies were conducted using in-depth interviews such as Taminiau et al. (2007), they were conducted in consultancy firms and not higher education. The study of Cranfield and Taylor (2008) was based on in-depth interviews and aimed at higher education however, it was mainly concerned with verifying whether the higher education sector was ready for KM and thereby creating a research gap regarding the influence of KS on innovation in higher education. The current study basing on the case study method while using in-depth interviews as the principle data collection technique, seeks to fill research gaps that were left by previous studies. The next chapter presents the methodology and the research paradigm that guided the study.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter discusses the methodology used in this research and provides justification for the choices made. The chosen guiding research paradigm for the study is given along with reasons for which this choice was made. The reasons for choosing the case study method for conducting the study are presented and the ways for achieving credibility explained. The research design for the case study has been delineated. The sampling technique and the criteria followed in obtaining the sample have been elaborated. The benefits for conducting the pilot interview have also been highlighted. The data collection techniques, the ethical consideration and the limitations have been addressed. Finally, the method and approach used for analyzing the data has been discussed.

3.2 Research Paradigm

According to Crotty (2003), objectivist epistemology holds that meaning and therefore reality exists as such apart from the operation of any consciousness. He further asserts that this epistemology using the positivist stance assumes that reality or truth exists in the objects and is only waiting to be discovered by means of a careful study. The positivist's theoretical perspective suggests that another researcher following the same procedure and methods of study can always attain the same truth or results thereby leading to generalization of findings (Crotty). However, the purpose of this research was not to generalize findings. For this reason, the study was guided by the interpretivist theoretical perspective which aims at obtaining sufficient detailed data to facilitate transferability of findings (Pickard, 2007). The transferability however, should be based on similarity of context as stated by Erlandson, Harris, Skipper and Allen (1993), that following the interpretivist stance, transferability depends on contextual applicability.

In line with the interpretivist stance, this study was based on the constructivist epistemology which urges that truth can only be constructed through interaction of the investigator with the subjects of investigation (Crotty, 2003). The aim of this study was to determine the role of KS

in fostering innovation. The researcher therefore found it necessary to construct reality or meaning by interacting with the subjects who are engaged in innovative initiatives. This study was carried out using open-ended interviews and non-participant observations as means of interaction with interviewees at Tallinn University.

The truth that was eventually presented as results could not be assumed to exist before this interaction took place. The researcher in accordance with the constructivist approach believed that truth about the investigation would be a product of the interaction between him and the subjects (Patton, 2002). He therefore anticipated research results that could reflect his interaction with the subjects. The researcher acknowledges that much as KS may influence innovation, there may be other factors that contribute to this influence that the researcher did not investigate due to time and resource constraints. This study mainly dwelled on the influence KS has on innovation.

The researcher's preliminary ideas about KS had to be matched with his lived experience of the subjects' accounts. In this study, the researcher's initial interpretation of KS had to conform to his lived experience of the phenomenon, by interpreting views from the subjects about its role in fostering innovation at Tallinn University. The researcher remained open throughout the research process to alternative explanation of the phenomenon, observed, focused first on description and then on explanation while constantly checking the plausibility of alternative interpretation of the phenomenon.

3.3 Methodology

Gorman and Clayton (2005) state that whereas quantitative methodology assumes objective reality of social facts, qualitative methodology assumes social constructions of reality. In order to achieve the purpose of this study, it was deemed fit for the researcher to spend substantial amount of time interacting with and obtaining information from the subjects in order to achieve social construction of the reality. The qualitative methodology was therefore adopted. Patton (2002) states that qualitative methods facilitate study of issues in depth and detail. This is what the study intended to do in order to achieve its earlier stated aim. On the other hand

quantitative methodology requires the use of standardized measures so that varying perspectives and experiences of people can be fit into “limited numbers of predetermined responses to which numbers are assigned” (p.14). The researcher viewed this limitation as something that would only inhibit the interviewees’ potential responses and yet the detailed responses would be invaluable in explaining the role of knowledge sharing in fostering innovation. This reason justified the choice of qualitative methodology over the quantitative one.

Patton (2002) asserts that “the quantitative approach enables the measurement of reactions of many people leading to the generalizable set of findings” (p.14). The implication of this assertion however, was not the interest of this study. Instead of generalizing its findings, this study sought to obtain in-depth data regarding the phenomena under investigation and leave the findings open to alternative plausible explanations. The alternative interpretations should however, be dependent on the context to which they may be related or compared with. For purposes of this study therefore, the qualitative methodology was employed.

3.4 Method

Survey and case study research are two possible methods that would be used to study the role of knowledge sharing in fostering innovation in a public university. This notwithstanding, “during survey research interviewees are asked the same questions in the same way while restricting their potential responses within pre-coded parameters” (Pickard, 2007, p.101).

The researcher viewed pre-coded parameters as a limitation that may stifle the emergent nature of the research and also limit the much needed high level of detail and multi-directional character in the subjects’ responses. The consequences would have deprived the research of valuable information which is vital in explaining the phenomenon and building a case for further interpretation. Surveys are designed to produce a generalization within the population while on the other hand a case study is “an empirical inquiry that investigates a contemporary phenomenon in depth and within its real life context especially when the boundaries between phenomenon and context are not clearly evident” (Yin, 2009, p.18).

KS is a contemporary phenomenon whose boundaries in a public university are blurred which justifies the use of the case study method to delineate these boundaries. As stated by Yin (2009), case study methods should be used to profoundly understand a real life phenomenon but such understanding involves important contextual conditions because they are highly pertinent to the phenomenon. In this study, the contextual condition is innovation in Tallinn University which may have a relationship with the phenomenon of knowledge sharing.

Ethnography would have been the other possible method to use for conducting this study however, as stated by Pickard (2007, p.111) “the focus of ethnography is to describe and interpret a cultural and social group whereas the focus of a case study is to develop an in-depth analysis of a single case”. The focus of this study was to conduct an in-depth analysis of the chosen case. Moreover, a case study site is usually visited at regular intervals to engage in data collection that can be largely predefined, whereas ethnography demands prolonged engagement within context (Creswell, 1998). Taking the issues of time and resources into account, the case study method was deemed more feasible than ethnography for this study.

According to Pickard (2007), case study research is a method designed to study the particular within context and has a very specific purpose. The purpose of the research is to study the role of KS in fostering innovation at Tallinn University. Emphasis was put on studying the phenomenon of knowledge sharing and this called for the use of instrumental case study (Pickard) whereby the purpose of the study is to investigate a particular phenomenon or theory defined here as KS and the case acts as a vehicle for the investigation.

Another pertinent point that Yin (2009) makes, is that one of the most important applications for case studies is to explain the presumed causal links in real-life interventions that are too complex for the survey or experimental strategies. KS being one such causal link in real life, further justifies the use of the case study method for its explanation. Moreover, Yin further stresses that the case study is the preferred method when the research questions seek answers to “why” and “how” because such questions deal with operational links needing to be traced over time such as the ones posed for this study rather than questions that seek to find out mere frequencies or incidences.

3.5 Research Design

Yin (2009) points out that the main purpose of a research design is to help to avoid the situation in which the evidence does not address the initial research questions. He further contends that the design addresses logical problems rather than logistical problems. In order to obtain logical results, it was therefore imperative that this study made explicit the components of the research design. According to Yin, a case study's research design includes a study's question as shown earlier in chapter 1 section 1.3, its proposition, its unit(s) of analysis, the logic linking the data to the propositions and the criteria for interpreting the findings.

The study proposition is the contribution of KS to innovation while the unit of analysis is KS but the embedded units of analysis are the innovation initiative projects in Tallinn University. The contextual event surrounding the unit of analysis is innovation at Tallinn University.

3.6 Credibility

Qualitative methodology often applies triangulation as a way of establishing credibility, including for example triangulation of investigators, theory techniques or source (Denzin, 1978). In order to ensure credibility for the research, this study not only used the interview data collection technique but also observation, document analysis and, verification on websites. Patton (2002) contends that the combination of interviews, observations and document analysis for a particular study leads to the attainment of triangulation in a qualitative inquiry. Yin (2009) claims that the purpose of triangulation is to collect information from multiple sources but aimed at corroborating the same facts or phenomenon. The researcher therefore looked out for similarities from the different data sources that were aimed at explaining the phenomenon.

This notwithstanding the researcher was mindful of the fact as stated by Patton (2002, p.248) that "different kinds of data may yield somewhat different results because different kinds of inquiry are sensitive to different real world-nuances". Following Patton's further assertion, the researcher treated any such inconsistencies as illuminative and offering an opportunity for

deeper insight into the relationship between the inquiry approach and the phenomenon under study.

3.7 Sampling

The researcher considered academic and administrative staff at Tallinn University as the wider population. Sampling is used when it is not practical to include the entire research population in your study (Pickard, 2007). Purposive sampling was adopted over probability or random sampling because the emphasis of the study was on quality rather than quantity. The objective of the research was not to maximize numbers, but rather in line with purposive sampling, to become saturated with information on the phenomenon under study (Padgett, 1998)

According to Patton (2002), “the logic and power of probability sampling derives from a purpose; generalization” (p.46), a purpose that this study didn’t seek to pursue. He further asserts that the power of purposeful sampling on the other hand is derived from the emphasis on in-depth understanding, a desirable component for a case study such as the one under investigation. In order to get out an in-depth study of the case, purposive sampling was used in getting the sample to engage in the study.

The logic of purposeful sampling lies in selecting information rich-cases for study in depth (Patton, 2002). Pickard (2007) elaborates that information rich cases are those in which one can learn a great deal about issues of central importance to the purpose of the research. For the study to be interactive in nature and in order to uphold the emergent design, the researcher specifically used snowball sampling. Snowball sampling is qualitative and maintains the emergent nature of the research (Pickard). Using snowball, the researcher made initial contact with a key informant from the Knowledge Transfer Centre. This key informant pointed to other potential interviewees and the next subjects also pointed to others as the research progressed. The purpose of such a sample was to maximize information yield (Pickard). The researcher terminated the sample at a point during the study when no new information was being obtained from new interviewees during the inquiry. This therefore made it impossible to pre- determine the size of the sample. The criterion used to determine when saturation was achieved was information redundancy, not a statistical confidence level as advised by Lincoln

and Guba (1985). However, they further suggest that a dozen or so interviews, if properly selected, would exhaust most available information to include. Saturation was reached when no new information was being obtained regarding the phenomenon under investigation. This occurred after interviewing 15 interviewees.

3.8 Data Collection Techniques

3.8.1 Interviews

Considering that the researcher sought to obtain qualitative descriptive in-depth data that is specific to the individual subjects, the interview data collection technique was adopted. The purpose of an interview is to access what is in and on the interviewee's mind (Patton, 2002). Except for the administered questionnaire, all other interviews allow for some degree of interaction between the researcher and the subject (Pickard, 2007). This helped provide an ample opportunity for the researcher to interact with the subject which interaction led to the construction of meaning and provided substantial information about the phenomenon under investigation.

The interviews were in-depth and open ended but guided by an interview guide that had been prepared earlier (see appendix 1). This was helpful in keeping focus of the phenomenon while creating sufficient space and time for the interviewees to control the process as they answered question pertaining to the interview. Patton (2002) indicates that the interview guide is meant to provide topics or subjects areas within which the interviewer is free to explore, probe, and ask questions that will elucidate and illuminate that particular subject area.

The interview was set in such a way that the researcher used a basic checklist to make sure that all relevant areas of the topic were covered while allowing space for him to explore, probe, and ask a question not previously specified when something seemed relevant to the study. The check list included topics like the subject's experience of KS, perception of innovation, contribution of KS to innovation and others related to the subject of investigation. This type of interview approach is useful for eliciting information about specific topics (Pickard, 2007).

The researcher had learned earlier that the university had a Knowledge Transfer Centre that coordinates various innovative initiatives between the university and the private sector. The researcher then decided to take one of the staff at the centre as an initial informant. An introductory e-mail message with the request for the interview was sent to this first interviewee and a positive response with indication of the date and time of the interview was received a day later. This staff was interviewed but the outcome of the interview was not included in the findings. The purpose of interviewing the initial informant, was to conduct a pilot interview in order to reflect more on and improve the interview questions and to request the interviewee to point to other potential interviewees who would also point to others as snowball sampling progressed.

The first pilot interview was helpful because basing on the time it took (one hour and thirty minutes) the interview questions were revised in such a way that all the irrelevant questions were eliminated and only questions that sought to answer or were related to the research questions were preserved. For example, the following questions were eliminated after revision of the interview guide following the pilot interview:

- 1) What are the reasons for a particular institute performing better than others in innovations? This was eliminated because the focus of the interview was not to evaluate the strength of the most innovative institutes or departments.
- 2) Who always comes up with the original ideas and why? This was eliminated because the question was not realistic given that it is not easy to always recall the original owner of an idea during KS let alone know why this happens. The other reason is that it was not very relevant to the study. The question about how staff share knowledge was modified to include asking whether there were any particular tools that the interviewees used to share knowledge.

The refinement of questions didn't stop here though, each subsequent interview gave an insight on what else should be probed in order to obtain and compare different perspectives about the same issues from various people. For example, in one interview, before even asking about impediments, the reasons impeding KS that was given by one interviewee were related to personality issues and yet on asking the same question to the next interviewee, the reasons were related to the building structural issues and office space arrangement. After the first

interview, all subsequent interviews lasted not more than an hour and were recorded both on a digital recorder and a personal mobile phone to provide backup in case anything unforeseen happened. As the recording went on during the interviews, the researcher took notes of important points using ink in a note book to make analysis easier and faster later after transcription. Whenever a question was asked, the question number was written in the note book, and notes of important points were taken corresponding to that particular question number and if something came up that was not related to the question, important points pertaining to that were given a small subheading but under the question number that elicited such a response.

After each interview, a copy of the audio recording was uploaded on a laptop for back up purposes. All interviews were conducted in the offices of the interviewees except four that were done near a restaurant located within the university. Whenever an interviewee recommended another potential interviewee, an email was sent to the target interviewee introducing the researcher, mentioning the aim of the interview and requesting for the interview. As mentioned above the point of saturation was reached after interviewing fifteen interviewees.

3.8.2 Observation

“When the case is carried out in a natural setting of the case, some relevant behavior or environmental conditions will be available for observation, such observations serve yet as a source of evidence” (Yin, 2009, p.109). Since this study was carried out in its natural setting, the researcher took advantage of this fact to use the observation technique as a source of evidence. In line with further advice by Yin, the researcher at times used the observation technique less formally to serve as an additional source of evidence during times when other evidence was being collected such as that from interviews.

In line with Patton’s (2002) assertion, that “the physical environment of a setting can be important to what happens in that environment” (p.281), only observations that were deemed helpful in explaining the phenomenon under study were presented. In some instances

photographs were taken on request to back up evidence of findings if such evidence warranted observation of the surroundings or settings.

3.8.3 Document Analysis

Yin (2009) contends that apart from studies of pre-literate societies, documentary information is likely to be relevant to every case study topic. This study was carried out in a university setting where documentation is part of the requirements for the various actors there in. The researcher made use of documentation that provided additional evidence of the claims made in the interviews or qualified as data sources in the context of the study. This of course took into account digital documents such as, project reports, proposals, publications, websites, and any activities done online that qualify as sources of evidence.

Yin (2009) elucidates that “because of their overall value, documents play an explicit role in any data collection in doing case studies” (p.103). This assertion was not to be taken lightly but rather to make good use of it, online documents were explored even before the site visits. This is supported by Patton (2009) stating that “documents prove valuable not only because of what can be learned directly from them but also as stimulus for paths of inquiry that can be pursued only through direct observation and interviewing” (p. 294).

3.9 Limitations

While using snowball sampling, the first key initial informant was purposively selected. Reference is made to section 3.8 that includes how this potential source of bias was mitigated. The principle data collection tool was verbal interviews and therefore some interviewees could have painted positive pictures of some situations, thinking that that’s what the researcher wanted to hear. To suppress bias that could have accrued as a result of such responses, whenever overly positive responses were heard from an interviewee, the researcher probed them with the next interviewee to get a balanced picture or confirm such claims. Likewise, overly negative responses underwent the same process of confirmation to reduce bias. This

was done with utmost care in order not to reveal the source of such claims while seeking their confirmation.

3.10 Ethical Considerations

The interviewees were sent an e-mail message before the interview indicating the purpose of the interview. This was followed with a promise that the interview was being done for purely academic research purposes just before each interview began. The interviewees were promised anonymity during the presentation and discussion of findings and this was followed through to ensure ethical values.

3.11 Data Analysis

According to Yin (2009), every case study should have a general analytic strategy to determine what to analyze. He further asserts that “no data manipulation method should substitute the adoption of a strategy in the first place” (p.129). He provides four general strategies which include; relying on the theoretical propositions, developing a case description which includes the development of a descriptive framework, examining rival explanations and using both qualitative and descriptive data. For the purpose of this study, the strategy of relying on theoretical proposition has been followed. Yin contends that this strategy suits a case study whose original objectives and design are “based on the proposition and are clearly reflected in the study’s research questions and literature review” (p.130). This case study has clearly been guided by its objectives that are well reflected in its research questions as shown in chapter 1 section 1.3 and therefore justifying the choice of the general strategy. This implies that the case study design was vital in guiding the analyst in determining which data to focus attention on and which data to ignore.

Given the emergent and inductive nature of the study, the constant comparative analysis, was used for analyzing the data. Careful analysis of data items using the constant comparative method, leads to the emergence of conceptual categories that would be useful in describing and explaining the phenomenon under study (Melia, 1997). The gathering and analysis of data

was done concurrently to create room for further consultations with subjects in case of necessity for further clarification on data as the study progressed. Qualitative analysis involves a constant interplay of data and analysis, data informing analysis and analysis informing data (Pickard, 2007).

Data from different sources was compared to identify differences and similarities in order to develop conceptualizations of various pieces of data. The researcher, as much as possible resisted the temptation to use prior accumulated knowledge but rather used raw data in the creation of categories as illustrated in the grounded theory methodology of Glaser and Strauss (1967). This is elaborated by Pickard (2007) when she states that “constant comparative analysis demands that the creation of categories is driven by the raw data and not established a priori, although it is inevitable that prior research will have identified some of the salient issues” (p. 241). To keep up with this notion, the analysis of interview transcripts and observation notes was based on the inductive approach which was geared at identifying patterns in the data by means of thematic codes. Patton (2002) states that “Inductive analysis involves discovering patterns, themes, and categories in one’s data” (p. 453). He further elucidates that the findings emerge out of the data through the analyst’s interaction with the data.

Transcription usually was done immediately after each interview. The analyst didn’t wait for completion of the entire interview process in order to start transcription. This enabled the analyst to get back to the interviewees by e-mail and sometimes physically to seek clarification thereby giving the study the character of iteration. This culminated into an iterative process which was helpful in upholding an emergent design. This kind of iteration makes up part of the strength of a case study because it allows confirmation or refutation of emerging themes as the analyst is aware of them before end of data collection and can adapt the data collection to respond to these emerging themes (Pickard, 2007; Miles & Huberman, 1994).

Formation of Categories

Data with similarities was grouped together into categories, while assigning a set of properties to each category basing on thematic codes which were used in the identification of data addressing similar issues. This is termed as open coding to mean being open to data (Strauss & Corbin, 1998). The interviews were transcribed in a double page note book but usually only on the page on the right-hand side. This was done to preserve the page on the left hand (opposite) side for analysis. The analyst began by reading through all of the interview data after transcription while making comments on important points of the data. This was aimed at identifying topics and similarities in data. Similar phrases of passages were then coded with arrows pointing to the codes on the opposite pages which provided the basis for formation of categories. For example Codes like “KST” which represented knowledge sharing tools were assigned to wherever data representing the tools appeared.

Another round of reading was done in-order to get data bearing same codes together and formulates patterns which later led to the formation of categories. This process of reading and re-reading was done several times before formulating the final categories. Several readings of the same data may be vital before observation notes or interviews can be completely indexed or coded (Patton, 2002).

3.12 Conclusion

This chapter provided a detailed discussion of the methodology used in this research, including the research paradigm that guided the study. The sampling criteria and the means for achieving credibility for the research were provided. The research design was elaborated according to Yin’s case study research design. Justification for the choices made for the method, and data collection techniques were given. The limitation and ethical consideration were given. Finally the strategy, method and approach used for analyzing the data were discussed. The next chapter will present the findings that were obtained using the above mentioned methods.

CHAPTER 4: DATA ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter presents the analysis of the data collected during the study. First, the institutional background information is presented. This includes information about the university as a whole, Knowledge Transfer Center of Tallinn University, Enterprise Estonia, and the Centre for Educational Technology. Giving this information is vital in defining the context in which the study was conducted. Secondly, the data collected from the interviews, observations and document analysis is provided. The interviewees' quotes are presented as they were said by the interviewees. The observations that were made during the data collection process are mentioned. Complimentary evidence from mostly electronic documents is also presented when it corroborates the evidence given orally by the interviewees. Lastly, the discussions which highlight the similarities or dissimilarities between the literature and the empirical evidence are presented.

4.2 Institutional Background Information

Tallinn University was established in 2005, as a result of a merger of 4 formerly independent institutions that included a university and research institutions ("History," n.d., para. 1). However, the main founding member was the Tallinn Pedagogical University which has carried on the traditions of teacher training that go back to 1919, when a Teachers' Seminar was established in Tallinn. Through a series of reorganisations, this seminar was turned into a higher educational establishment in 1952 and finally obtained the status of a public university in 1992 ("History," n.d., para. 7).

Tallinn University is a public institution of higher education. Its main strengths lie in the fields of humanities and social sciences, but it also has a strong and constantly growing component of natural and exact sciences, as well as a notable tradition of teacher training and educational research. It is a public university funded by the government of Estonia. It is the third largest university in the country, consisting of 19 institutes and 5 colleges. It has more than 9500 students as well as more than 540 faculty members and research fellows, and is the fastest

growing university in Estonia according to information on its website (“University today,” n.d. para. 2-3).

The university sees itself as providing an environment which encourages the intellectual and personal growth of all its members, faculty and students alike, and has proclaimed as its values academic quality (which involves combining research and teaching), solidarity and collegiality, procedural transparency and simplicity, openness (which involves significant internationalization) and an outward focus on society instead of isolating itself in an ivory tower. The university has committed itself to the strategic goal of becoming an international research university with a strong social conscience, a flexible and collegial environment for learning and personal growth, where considerable academic freedoms guaranteed to both the students and the faculties are balanced by strict quality requirements. One of the main aims of the university is large-scale internationalization – with its eleven academic degree programs and a number of shorter programs and courses offered in the English language. It is already the most international university in the Baltic area (“University today,” n.d. para. 4).

4.2.1 Knowledge Transfer Center of Tallinn University

The Knowledge Transfer Center is a small department in the university that acts as a liaison between the university staff and the industry. The centre was established in 2004. The objective of the centre is to create and strengthen ties between the university and the business sector. The centre operates under the Spinner project and is financed from European Union (EU) structural funds (“Knowledge Transfer Center,” n.d., para. 3).

According to the university website, the primary role of the center is linked with the direct transmission (transfer) of the university’s know-how and competences (knowledge) to businesses and institutions with the aim of increasing economic competitiveness. The center operates on the principle that knowledge transfer is a potential source of new hypotheses needed for the development of research and academic activities and offers additional financial resources. This is in line with one of the strategic goals

of Tallinn University, which is the social and commercial application of research outcomes in addition to academic and research activities (“Knowledge Transfer Center,” n.d., para. 2).

Some of the services the center offers to university staff include:

- assistance with the project from start to finish;
- raising the financial resources required for the development of research-based products and services;
- advising researchers writing R&D project applications, helping them write the applications;
- counseling R&D project managers;
- locating project writers and managers;
- promoting knowledge services offered by the university;
- help and advice in the field of intellectual property;
- help and advice on establishing spin-off companies;
- exchange of business contacts and facilitating cooperation with businesses and institutions;
- providing information to university staff on innovation and business-related subjects and
- introducing the competences of the university to the general public (“Knowledge Transfer Center,” n.d., para. 5).

4.2.1.1 Some of the Success Stories Registered by the Knowledge Transfer Center

This sub section highlights some of the success stories that were recorded by the Knowledge Transfer Center. The projects that led to the success stories were done by staff from different institutes at the university in collaboration with the center and the private sector.

The usability study of the digital archive and the electronic document management system-This was done by the staff from the Institute of Informatics, Centre for Educational Technology. According to the university’s website, their client had developed a complex package of software for keeping digital archive and the electronic document management

system. They approached Tallinn University to have the selected functionalities of the software to be analyzed for optimum usability. The results of researchers' job were the documented guidelines for making the software user interface more comfortable and attractive to the users. The study was carried out using heuristic usability analysis method that in turn included usage of logging, analysis of video footage recorded during the software usage sessions and interviews with the test users.

Comparative content analysis for the mathematics textbook for 9th grade

This was carried out by the Institute of Mathematics and Natural Sciences. The Institute analyzed the strengths and weaknesses of the textbook for the client's newly published book, comparing the contents of the book with similar textbooks for 9th grade pupils in Finland, Germany and Russia. The research team further suggested improvements that the client could make in the book, based on the report of the analysis.

Behavioral tests for recruitment of mid-level personnel

This was conducted by the Institute of Psychology. To further improve the service and sharpen their competitive edge a client ordered for consultations and series of behavioral tests for recruitment process of mid-level personnel. The scientific-reading-matter-based-tests were assembled to suit the needs of recruitment of sales managers, production managers, project managers and office managers.

DVD about learning how to swim

This project was done by the Institute of Health Sciences and Sports. According to the university website, the institute produced a visual study aid serving as a tool for everybody who wishes to learn how to swim or improve the technique. Copies of DVD have been sold to the public and the DVD came at the right time when every summer had started registering some death due to drowning in the sea ("Success stories," n.d., para. 1).

4.2.2 Enterprise Estonia

Some background information about Enterprise Estonia is important because it has sponsored many innovative initiatives that the university has done in collaboration with or on behalf of the private sector with the help of the Knowledge Transfer Center.

According to its website, Enterprise Estonia was established in 2000 and promotes business and regional policy in Estonia. It is one of the largest institutions within the national support system for entrepreneurship, providing financial assistance, advisory, cooperation opportunities and training for the entrepreneurs, research establishments, public and third sector (“Enterprise Estonia,” n.d., para. 1).

Enterprise Estonia operates in the following sectors:

- increase of sustainability and acceleration of growth of the new companies;
- improvement of export and product development capability of the Estonian companies;
- involvement of foreign direct investments in the Estonian economy;
- increase of tourism export and development of domestic tourism and
- promotion of region development and civil society (Enterprise Estonia,” n.d., para. 2).

4.2.3 Center for Educational Technology

Some background information about the Center for Educational Technology (CET) is vital because according to most interviewees, staff members from the CET, contributed most to the innovations at the university.

According to the centre’s website, it was established in 1996. It is an interdisciplinary R&D unit within the Institute of Informatics. CET staff (17 in total) consists of 8 full-time researchers, 5 software developers, 2 project managers, 1 post-doc, some part-time employees and a group of postgraduate students. Scientific and technological qualifications of CET staff intertwine deep knowledge in educational research, participatory design, open-source software engineering, and experiences of empirical research in authentic educational and work settings in the field of technology-enhanced learning, competency management, interactive media art, interaction design and Semantic Web technologies (“About the center,” n.d., para. 1).

The Institute of Informatics of Tallinn University and CET have established partnerships with leading Estonian software companies (Skype Estonia, Web Media, Eomap, Playtech, Net Group), and also with the main open-source based learning technology providers in the Baltic Sea region (JukuLab OU in Estonia, Media Maisteri OY in Finland). CET is also one of the key contributors to the technology-enhanced learning infrastructure of the Estonian E-University (Consortium of all major Estonian universities), thus providing a unique opportunity to use almost for the whole higher education sector on the national level as a test-bed for new tools and methods for technology-enhanced learning (“About the center,” n.d., para. 1).

4.3 Interviews, Observations and Document Analysis

In order to uphold ethical values anonymity of the interviewees was maintained. This therefore means that, their identities have been concealed. However, the analyst chose to assign the interviewees numbers such that the analysis can easily be followed by having the knowledge of which interviewee said what. The interviewees have been assigned numbers from 1 to 15. It is important to note that one of the interviewees (no.1) participated in the pilot interview. Her account was all transcribed and studied but has not been included in the analysis because of reasons that have been given in chapter 3, section 3.8. The proceeding sections consist of interview accounts from interviewees, data that was obtained through observations of the setting in which the interviews were conducted and data from electronic documents which were also used as data sources for the study.

4.4 Perception of Innovation

This section discusses how the interviewees perceived innovation. This was intended to find out how players in higher education specifically at Tallinn University perceived innovation. Most interviewees perceived innovation to be something new that didn't exist before. They however, stressed that innovation shouldn't only be tied to technology though most innovations have been technology oriented. One interviewee pointed out that as much as the development of new software constitutes an innovation, developing a new curricular or new

course also qualifies as an innovation. Another interviewee gave an example of a course unit that was developed from scratch in the Institute of Informatics. He said the course didn't exist before but its content was developed by various staff's contribution. Another interviewee said that innovation could be a new teaching method or a new research method that is used differently from the previous methods that existed before. This particular interviewee said that he had been involved in creating a new research environment and coming up with new ways of attracting funders and to him that is innovation. A significant number of interviewees also added that innovations can also be changes of processes or changing the ways things used to be done. One interviewee for example had this to say:

The innovation of practices of how we do things is just as important as the innovation of things we do things with. For instance if something is changed in our culture or the social way of doing things, for example it may be in management or social organization or something like that, that could also be considered innovation. [Int. 9]

It is worth noting that interviewees whose departments are related to IT also reported that innovation shouldn't be always tied to inventing something. They said that sometimes it involves re-thinking and redesigning something that has already been in existence. One interviewee referred to an example of the mobile phone. He said that mobile phones were already in existence but the I-phone was considered an innovation when it came on board.

Another interviewee who also agreed with the concept of redesigning, said that innovation may not necessarily begin from scratch. He said that sometimes even without re-inventing the wheel, an innovation can be born. "Innovation at times is not something new; it's taking up something that already exists and doing it differently." [Int. 10]

Another point worth mentioning, is that most interviewees mentioned that an innovation should be beneficial to the people for whom it is intended. They said that for something to qualify as an innovation it should have a positive impact on the society it is meant to serve. One of the interviewees with this view stressed that innovation should be beneficial to the intended audience. He expressed his view in the following way: "Innovation is something new and this may be a product, methods or new approaches to doing things. It could be any of these but must be beneficial or have a more positive impact to the society." [Int. 11]

Another interviewee in support of the above mentioned view had this to say:

“Innovation is an artifact or a process or an idea that is made/carried out differently and in a more effective way than before and leads to the advancement of activities.” [Int. 3]

Other interviewees attributed innovation to a monetary or economic value. They argued that for something to qualify as an innovation, it should have monetary value and should be a potential contributor to economic development towards the nation. One of the interviewees with this view explained this in the following: “Innovation involves transferring theoretical knowledge into something that can be sold. For example our department had a project with a telecom company making educational games.” [Int. 14]

Most interviewees agreed that most innovations have a technological orientation. Some interviewees claimed that most innovations are a combination of theory and new technology but the technology acts as a facilitator for the application of theoretical knowledge. One of the interviewees with this view had this to say: “Innovation is using the latest technology in the process applying theory to practice. The technology though only acts as an enabler in this process.” [Int. 8]

By and large, the description of innovation as something new and as redesigning something that existed before was common admission by most interviewees.

4.5 How Staff at Tallinn University Share Knowledge

This section describes the various ways staff at the university share knowledge and how they do it.

4.5.1 Meetings

Most interviewees said they usually share knowledge during official meetings. Some said they hold meetings aimed at solving prevailing problems or creating solutions for important issues. For example one interviewee mentioned that they held brain storming meetings to respond to questions such as “what does it mean to practice research based teaching?”[Int. 12]

One interviewee pointed out that all staff are expected to attend such meetings but some may not be willing to contribute. They said that such meetings involve a lot of brain storming. They

said that contribution is voluntary and may depend on an individual's interest in the subject. Another interviewee who was a head of an institute said that people tend to take meetings for granted and some may not even turn up. These were some of his words:

Every month we used to have meetings and people discussed about their projects. But these kinds of things tend to stop because somebody is missing and if people take them for granted and miss, then others will say that next time I am also not coming because it is just a task. There should be other ways for people to meet and share knowledge. [Int.5]

He said that to ensure that staff share knowledge, meetings shouldn't be the only avenue for KS.

4.5.2 Informal Knowledge Sharing

The findings showed that holding meetings was not the only way in which staff share knowledge at the university. Many interviewees revealed that sometimes they end up sharing knowledge even without prior planning or pre-meditation for it. They said such sharing occurs during informal gatherings especially while having meals with colleagues. Some interviewees said they share knowledge with colleagues when they meet them in the cafeterias and restaurants during coffee breaks and when they are having lunch. One interviewee indicated that the conversations usually start with issues that are not work related but eventually tackle work related matters. For example one interviewee had this to say about informal KS:

You never know when knowledge sharing happens; a normal researcher has all sorts of ideas in their heads. You never know when you meet a smart student in a cafe, a good colleague in a swimming pool and many papers are started like that. For example one of my PhD students sketched the outline of her thesis over a lunch meal with me. She happened to have had a languages background, having acquired her masters in the subject. She was thinking of what to do next. As we had our meal she started asking me what was common between languages and geography. We shared ideas and I was telling her geography is wide you can do this, you can do that, and as we said all these things she wrote the outline on a small piece of paper she had picked at the table. The outcome of it all was her PhD thesis. Up to now she still has that tiny piece of paper framed and pinned on her wall. [Int. 15]

Some interviewees felt that informal KS was the best way for people to share their unique expertise. One interviewee from the top management said that informal KS allows the free flow of ideas while formal KS may restrict them. This particular interviewee explained his

view in this way: “You may find that people have innovative ideas but how to get them from their heads and share them with others becomes a problem. For such cases it is better that these ideas are shared in a relaxed informal settings and not formal meetings.” [Int. 14]

Most interviewees said they had been involved in informal KS unwittingly. They admitted that sharing knowledge in relaxed informal atmosphere was beneficial and should be encouraged.

4.5.3 Seminars, Workshops and Conferences

Interviewees also mentioned that they share knowledge during local seminars. Some of the seminars are periodical and therefore it makes the staff very prepared for them. Some interviewees also said that they share knowledge in local and international conferences. For example one interviewee said he always makes presentations in conferences about his ongoing projects even when they are in their early stages. He said he does this in order to get ideas from other people concerning the same projects. He claimed that this had been beneficial for his projects. He had this to say:

I write a short workshop paper or conference paper before we start the software development. So we do the personas and scenarios and when we present these to the conference, we get feedback. It’s really important to make this sharing quite early to get feedback. [Int. 7]

He under scored the importance of getting feedback from such conferences or workshops.

4.5.4 Daily Basis in Office

Several interviewees said that they share knowledge on a daily basis with colleagues while in office. Most of the staff who mentioned this said this was possible because they share one big room with their colleagues and sit very close to each other. They said this enables them to consult and respond to their colleagues’ queries easily. For example one interviewee had this to say: “Since we sit in one room it is very simple to contact one another when we need a colleague’s input.” [Int.2] She emphasized that the fact that they sit in one big room, allows them easy contacts with each other and therefore enhances their KS. According to the researcher’s observation, one of the big rooms accommodated more than 15 people with each having their own desk. Another interviewee with a similar view about this had this to say:

“All of us work in this room here and so we communicate. We always have lunch together, and have coffee table discussions and try to discuss and keep each other informed about on-going projects.” [Int. 6]

Another interviewee in agreement with the above mentioned view stressed the fact that having a group of staff working in one room or sitting close to each other enhances KS among them. He said: “If you have one big room with lots of people working on different projects there will be a lot of discussion and KS actually takes place. In fact it’s not even intended but it takes place as people go about their daily work.” [Int. 7] Interviewees said that in order to benefit from the daily KS in office, it is essential that staff have reasonable proximity to each other’s work spaces.

4.5.5 Collaborative Writing of Research Papers and Research Grant Proposals

Sharing of knowledge amongst colleagues is also experienced during collaborative writing of research papers and research grant proposals. One interviewee said they made sure that research papers were co-authored. Another interviewee said they always wrote grant proposals collaboratively with colleagues. This particular interviewee had this to say: “We write funding proposals together as a group and this involves exchanging ideas as colleagues and I think it is knowledge sharing.” [Int.10] Some interviewees said that some people may not write any text but may read drafts and their perspectives make the work better.

4.5.6 Team Work and Networking

Some departments work as teams in order to foster KS. One interviewee from the e-learning unit said it was easy for them to share knowledge because they work as a team. In her own words, she had this to say:

We find it easy to share our knowledge because we work as a team you know....everyone has different specialties; we have web designers, material designers, and a learning environment specialist. We share our knowledge as a team to make something new. [Int. 2]

Another staff member from another administrative unit concerned with public relations said they have a network of colleagues and student volunteers with whom they share knowledge

regularly. This particular interviewee said they also get input from students during orientation programs. In this network, the interviewee said they work in collaborative manner constantly consulting each other and sharing ideas that include best practice from other universities.

4.5.7 Dissemination

Interviewees from the Center for Educational Technology reported that they also share their knowledge in the form of dissemination to the rest of the university. They said that they normally hold an annual dissemination day that was named E-vent. They said during this day they present findings about their research, innovation projects and also seek feedback. One interviewee from this particular department said they also share knowledge by publishing about their ongoing projects in the university newspaper and their own newsletter. The analyst checked the website of the center and realized that previous dissemination sessions were made available via the website in form of videos of the events recorded in past dissemination days.

4.5.8 Knowledge Sharing with Other Universities

Most interviewees said that they do not only share knowledge with colleagues at Tallinn University, but also with colleagues from other universities. They said they have developed several innovative initiatives by collaborating with international colleagues and colleagues from other local and international universities. For example one interviewee from the Center for Educational Technology had embarked on a project to develop aid tools for supporting the professional development of learning technology support persons. He said this project was going to be undertaken by six universities including universities in Tallinn and other universities around Europe. He said all that implied that there would be a lot of KS among colleagues from the different universities participating in the project. Another interviewee from the Institute of Humanities said he was heading a centre of excellence for cultural studies whose partners included colleagues from other universities in the country and abroad. This particular interviewee had this to say: “International collaboration is also very vital for KS because you get to learn best practice from your colleagues elsewhere.” [Int.15]

The interviewees said that although most of the collaboration with staff from other universities is done online sometimes they travel and meet their counterparts physically.

4.5.9 Knowledge Sharing with People outside One's Realm

Some interviewees said that in order for innovation to be achieved through KS, they share knowledge with people who are not necessarily in their realm of profession or people who have completely different professional background. One interviewee from the Institute of Health Sciences and Sports who has been involved in various innovative initiatives said he always shares knowledge with people from other professions. He said he normally did this in a very informal way. He had this to say:

I tend to go and share views with people operating in different fields ranging from hospitals, to marketing and movie making. This widens my network and enables me to get new perspectives from those people and some of their ideas can be combined with ideas from my field to produce an innovation. [Int. 5]

Another interviewee who also emphasized the issue of sharing knowledge with people from a field where one doesn't belong had this to say:

It's important to share knowledge even with people doing things different from what you do in order to come up with innovation. For example next week we plan to go to Tallinn Zoo to explain to them what is our vision of using mobile tools, and mobile services. They know how the Zoo works and what their clients expect, so they will share that with us then we try to map that with our technological and pedagogical vision to come up with an innovation. [Int. 6]

The interviewees acknowledged that the Knowledge Transfer Center had been instrumental in connecting university staff to the private sector for various projects.

4.6 Knowledge Sharing Tools Used by Staff

This section presents the different tools used by staff at Tallinn University for KS. The findings show that the tools are both digital and analogue.

4.6.1 Web Blogs (LeContract)

LeContract is a weblog that was developed by staff at the Centre for Education Technology. It is used for KS purposes among software developers. It uses a participatory design approach where developers go to the users and carry out user studies and develop personas who are virtual personalities representing actual users. The developer then describes a scenario of how a particular activity by a user would be enhanced or improved for the user. This scenario is posted on the blog and other people contribute towards the same idea. These contributions are aimed at sharing knowledge until a viable solution is obtained and the software is developed. LeContract is still an ongoing project and apparently has attracted a lot of attention both locally and internationally. People share ideas and brain storm, virtually on how users' activities would be simplified using software that is not yet in existence. According to one of the interviewees, the blog is open to the public and anyone can contribute their ideas. Another interviewee said he had made presentations about LeContract in international conferences and it led to the generation of ideas from many international participants about the development of the software. One of the examples of a scenario that was posted on the weblog is given here below:

“Carl completed his university studies more than 10 years ago. Now when he is working as a freelance photographer he has time to take interesting online courses from different universities. He is especially interested in foreign cultures, history, arts and architecture. He is also an active user of social networking sites. In Facebook he notices that one of his contacts has published a learning contract in a site called LeContract. That seems to be interesting and Carl follows the link. He finds out that his friend is studying a web design course. He didn't know anything about learning contracts before. He thinks that this kind of contracts could help to keep participants motivated in online courses.

Next to the learning contract there are tags and links to other learning contracts with similar objectives. By browsing around he finds a learning contract that was created in an art history course. The woman who wrote the learning contract has published it almost a year ago. This looks like a course that Carl would also participate. In the comments he noticed also a link to the course website. Carl follows the link and finds out that it is an online course that will start

again in three weeks. That is really great news. Soon he can try to create his own learning contract.

Questions:

- *Did this scenario wake up any thoughts?*
- *Is there something you would like to change in that scenario?*
- *Could you image yourself to the role of the person?"*

One of the interviewees had this to say about the personas and the scenarios of the blog;

Personas are fictional users of the system we are about to develop. Usually there are 3 to 5 personas of typical users. Every persona has a specific goal, they expect from the system or service and when we define the goals, we validate them with focus groups, and then we write scenarios based on the personas. The validation with the focus groups is also based on the conceptual model of the system. Other people can then comment and share their thoughts on the same, thereby contributing to the development of the new software. So this is some kind of knowledge sharing because we try to harmonize the developers and the user expectations. [Int. 7]

Another interviewee who also uses blogs had this to say: "I became more popular as a partner in innovation projects due social networks and having the research blog." [Int.3] One of the interviewees said LeContract had enabled them share ideas with the wider audience and that it had the potential of attracting funding for the projects.

4.6.2 Mendeley

Some interviewees said they use the software called Mendeley for sharing research papers and references. According to one of the interviewees, the software is a web program for managing and sharing research data and collaborating online. It can be used online and on one's desk top while offline. The software enables loading of metadata of the papers and makes it possible to annotate the papers. It is available free of charge as long as it's used among three people. However, if the number of users exceeds three, payment has to be made. The analyst checked the Mendeley website (<http://www.mendeley.com>) and verified this information. One of the interviewees had this to say about this software:

I tend to be outside the social net work software but one of the tools I use for knowledge sharing is called Mendeley. It provides recommendations from other researchers in my group. I index my own electronic data for example when I am writing an article and citing ; I can go to Mendeley and view what others have done or have cited about similar work. Those other researchers can also access my work. [Int. 5]

These interviewees reported that Mendeley made it easier to do collaborative research.

4.6.3 Wikis (Trac)

Trac is an enhanced wiki and issue tracking system for software development projects. According to one of the interviewees, this is one of their most useful tools during KS for software development. It is connected to other wikis, with the documentation for software development, and developers can log into the systems and make contributions that are referred to as tickets. Tickets describe one feature or component that can be fixed or implemented. One of the interviewees said that for one of the projects they received around 2000 tickets as contributions by various developers.

4.6.4 White Boards

The Center for Educational Technology Department staff use the physical white board as a tool for documenting their discussions. When one of the staff members is working on a project, or an innovation initiative, they document the big idea on the board, and the rest of the staff members casually document their opinions as they pass by the board to their desks. At the end of the day, the ideas are useful in the process of innovation. One of the interviewees had this to say:

We not only use digital tools, but also non digital ones especially for half baked ideas. We use white boards for ideas in early stages. For example one of our colleagues is working on an xml language for harmonics and he has written this on this board (The researcher observed xml language code on the board). Currently, this idea is still quite vague and in the early stages. We keep it in the informal format. At this stage we use more analogue than digital media. We write down the vague idea such that when a person is passing by, they can add their contribution. It usually triggers discussions which we also document on the boards. [Int. 6]

According to the analyst's observation, there were two white boards in one of the big rooms that staff shared for office space.

4.6.5 Flicker

Two interviewees said that their department has an official Flickr group that they use for sharing photographs of themselves at social events. Such events include planning seminars that are held on ferry boats. The shared photographs also include clips of white board ideas that are captured before erasing them from the white boards to put other topics. They said colleagues comment on these photos and sometimes the comments lead to KS especially, regarding the clips of white board brainstorming ideas. Colleagues carry on with the brainstorming discussions by way of their comments. Regarding Flickr, one interviewee had this to say:

We also share photos of the white board ideas which I call half baked ideas. Before wiping out the board we take a photo and upload it on flicker and share it for colleagues to continue commenting and making contribution. [Int. 6]

The analyst was showed some of the photos described above.

4.6.6 Card Sorting

This is also a non digital tool that the staff use for KS. They use colored stickers on which they write concepts and then sort the cards according to matching concepts. For example according to one of the interviewees, the coordinator of a workshop writes the main concepts on the stickers. Other participants can then add their own contributions on the cards. The cards are then grouped according to matching or related concepts added by other colleagues. According to one of the interviewees, this had proven to be one of the best ways to share ideas and develop new concepts. He said: “Nothing beats Card Sorting; you can’t replace it with digital media. This is the best.” [Int.7] The analyst was showed some of the cards that had been used in one of the card sorting sessions.

4.6.7 Concept Maps

Interviewees from the Institute of Health Sciences and Sports and the Centre for Educational Technology said they also use Concept Maps. One of the interviewees from the Institute of Health Science and Sports said they use keywords while creating Concept Maps about concepts and they exchange the concept maps with other colleagues to find matching

keywords which formulate the basis for an innovation. One interviewee said that using concept maps as a tool for KS takes a lot of time and is better when you have enough time in order to use this tool effectively.

4.6.8 E-mail and Webmail

All interviewees said they used the e-mail heavily for KS. They added that as much as they used their personal emails for KS, substantial KS goes on via the university webmail. When asked about which tools she used for KS one interviewee had this to say:

“We use different environments in different projects, but still number one is e-mail.”[Int.3]

Another interviewee who revealed that they heavily depended on e-mail as a tool for KS had this to say. “We mostly use email; we don’t use Facebook at all.”[Int. 10]

The e-mail was the only tool that all interviewees confessed to have used for KS purposes.

4.6.9 Social Networks (Facebook and Twitter)

A significant number of interviewees said they used Facebook and Twitter for KS with colleagues at the university and people from outside the university. Most interviewees said they benefited from the links that people shared on the social networks and they also contributed by sharing links that they deemed useful for their colleagues. One interviewee from the top management said Facebook helps him find useful links and filtered news from the local and international media with people’s comments which he felt contributes to KS. This particular interviewee had this to say about Facebook:

Social networks contribute to knowledge sharing. For example, if someone finds a link on the internet and shares it with their friend, the friend may not have found that link before. The other good thing is the collective analysis and sharing of filtered content on social networks saves people’s time. You don’t have to read all media but you keep informed and get some ideas from other people’s ideas. For instance today I have written an article about somebody else’s article which I didn’t initially notice myself but found it through a link posted by a friend on Facebook. [Int. 9]

Another interviewee said that Facebook had enabled him share his knowledge using methods that he couldn’t use on his personal website. He had this to say:

Previously I was bothered responding to many users from all over the world on the website but nowadays I use Facebook by creating groups. For example after running a seminar on video analysis I created a group on Facebook where all participants were

added. I added more material regarding the seminar. Participants kept on commenting and asking question as I answered them and we just had a wonderful discussion for several days. [Int. 8]

Another interviewee said that they had setup a Facebook page for their department where everybody contributed. She said they post information concerning work related issues and information about new developments.

Another interviewee who by his account said he had benefited immensely by sharing knowledge on Twitter, also added that Twitter provides one of the fastest ways for sharing knowledge. He said he has been using the property of hash tags on Twitter that enables the filtering of content related to one's tagged content. He said this had enabled him share views with other researchers about his research interests. In his own words this particular interviewee had this to say:

Twitter helps quite a lot because I have hash tagged all tweets related to my project to get to know what others are saying about it and they also know what I am doing. I think using Twitter hash tags is the fastest way to share information. Last summer I was in a conference where we had 6500 Twitter posts in two days. It was really like a chat room. [Int. 7]

Although some interviewees reported having had online discussions about work related issues via the social networks, some interviewees also said that most of their colleagues on social networks shared non-work related issues.

4.6.10 Skype

Some interviewees said they also used Skype for KS with colleagues at the university and abroad. For example the interviewee from the E-learning unit said that sometimes when they need to consult colleagues from the Center for Educational Technology, they use Skype. Another interviewee said they usually exchanged views and ideas with their research colleagues in Finland using Skype.

4.7 Less Knowledge Sharing Across Departments

It is worth noting that many interviewees reported less KS among staff from different institutes and departments. They said that most of the KS was happening among members that belong to the same department. One of the reasons given for this kind of situation, was the fact that people are busy with other work and don't have time of moving around. The other reason that was given, was that management hasn't set up a system that facilitates such collaboration between members of different institutes. One interviewee felt this was causing many people to re-invent the wheel because they always try to do things that other institutes have already accomplished successfully. This particular interviewee had this to say.

There is no communication between institutes because the institutes are acting like independent universities and all the functions have been delegated to them by management. The institutes therefore operate autonomously and are not bothered about other institutes. Actually the delegation of functions is okay but some functions should be retained by the rectorate such as the one of holding meetings that bring together staff representing different institutes to discuss problems, success and expectations for all institutes. For example the university has received about fifty innovation shares from the Enterprise Estonia. Almost more than half of these have been successfully done by our institute. This means we have a lot of experience to share with other institutes that are just beginning to carry out such initiatives but we don't do that because of lack of structures to enable such collaboration. [Int. 12]

This view was shared by another interviewee who had this to say:

The organizational structure has boundaries between departments /institutes, and students are not encouraged to cross these boundaries by taking courses in other institutes, something that is not good for knowledge sharing. Departments don't know what other departments are doing. [Int. 15]

The other reason that was given, was that staff from the natural science departments often use experimentation and/or quantitative methods for research, while staff from the humanities departments use the qualitative approach and sometimes quantitative methods. The natural scientists therefore don't bother to share knowledge with the staff from humanities. One interviewee said this was one of the causes of mistrust among staff from the different fields of study. This particular interviewee said that re-inventing the wheel would be avoided, if people shared knowledge from across departments. He elaborated his view as shown here below:

My own subject is between the natural sciences and social sciences and humanities. In many cases I have been to conferences where natural scientists discover that there are problems that need solving using soft methods, then they start creating some sort of re-inventing the wheel instead of approaching social scientists to help them [Int. 15]

Some interviewees said the fact that some institutes were located off the main campus was also a barrier to KS across departments.

4.8 Using Face to Face Communication Vs Technology Tools for Knowledge Sharing

Most interviewees felt that KS involving people meeting physically had more impact than a situation where people shared knowledge using online tools. One interviewee said that KS for purposes of innovation was better if done face to face than use of online tools because it leads to people working together. He said simply sending someone information about how something is done, may not be enough to effect KS. Physically showing them how that particular procedure is done may be required for successful KS. He added that face to face communication for KS enables the use of handy tools like Card Sorting which are not possible using online tools. He explained that KS for innovation easily serves its intended purpose if it involves face to face communication.

Another interviewee from the Baltic Film and Media School with a similar view said that face to face communication for KS creates more impact because it fosters the ingredient of trust. He adds that it is very difficult to build trust between individuals if their communication is entirely based online. While stressing that trust is of paramount importance in KS, he suggests that the online communication should follow the face to face communication after trust has been established between the two parties. Another interviewee from the middle management made a similar assertion, stressing that relationship building is vital for KS and is achieved through face to face communication. He said:

In the beginning a face to face communication is very effective. One should have a relationship with someone. If you want to develop something new, face to face communication for knowledge sharing is important. It is good for building trust among the people involved. [Int. 15]

Another interviewee with a similar view stressed the need to build a relationship first before the usage of online tools. He said:

Face to face is better but people can't meet all the time. They can use technology but the technology tools will be more effective if the people using them have first of all established a relationship after meeting face to face. [Int. 10]

However, another interviewee said that the comparisons between the impact of face to face and technology tools for KS vary. He said that if one is to share knowledge with a big audience, technology tools will create more impact, but sharing knowledge from one individual to another is better done using face to face communication.

4.9 How Knowledge Sharing Contributes to Innovation

This section presents the interviewees' accounts that showed how KS leads to innovation. Before delving into the detail of how KS contributes to innovation, it was deemed essential to first of all establish by asking the informants whether KS has anything to do with innovation. This is dealt with in the next sub section.

4.9.1 Does Knowledge Sharing Contribute to Innovation?

When asked if they thought KS leads to innovation, all interviewees responded in the affirmative. They felt KS was important in any innovation process. For example one of the interviewees had this for an answer:

Knowledge sharing is awfully important because you can have your own brilliant idea, but if nobody else knows about it and even if they know about it and if they don't accept and make contributions, you can't turn it into a new product or service. You can play with it and think about it until your death, and nothing will ever come out of it. You have to share your knowledge and influence other people with it, and also accept them to come into your domain and influence you in order to come up with a new product. So, the knowledge sharing is really important though in the end it's the innovation that stands out and the KS is not even recognized. [Int.5]

Another interviewee who also had a strong affirmative response to the question had this to say:

Yes of course it is important; well any knowledge sharing can foster innovation because when I have some knowledge and I give it to some people from a different discipline, their thinking will be different from mine. For example when an IT person shares

knowledge with natural scientists, it creates a potential source of new ideas and leads to non-conventional ways which may be services or products. [Int. 13]

They emphasized that KS plays an important role in the process of innovation because it leads to innovative ideas that constitute the innovations. They said that they had participated in several innovative initiatives and acknowledged the role of KS in those initiatives. One interviewee said getting people to share their experiences towards a common goal, makes a big contribution to new knowledge which transcends into something new. Another interviewee from the Department of Sports Science and Coaching, said that KS involves embracing different and therefore dissenting ideas and all these put together produce a hybrid of ideas which yields the innovation. He elaborated his response as shown here below:

When I advise high level Olympic professionals to do something technical, I may say to someone do this, it will work and they may reply but why not do the other. This kind of sharing of ideas creates a new idea but this new idea has come as a result of the original two from me and the athletes and we have come up with many innovations in this way. [Int. 8]

Another interviewee from middle management said that through knowledge sharing the department developed a new program. He said:

Yes knowledge sharing contributes to innovation. People share their knowledge based on what they know and what they have learned from experience somewhere else. We started a program called educational technology in this way. We decided that every course should be developed jointly by two or three teachers. These teachers through knowledge sharing agreed on the content and the objectives of the course. [Int. 12]

Another interviewee from middle management with a similar view had this to say: “Absolutely, we can’t innovate without knowledge sharing, we always rely on some kind network to come up with new programs.” [Int. 4] Most interviewees said they had experienced situations where KS contributed to innovation.

4.9.2 Sharing Knowledge as Soon as One Acquires it to Achieve Innovation

Some interviewees said that in order to benefit from KS during the innovation process, knowledge should be shared as soon as it’s constructed. They said that waiting for so long with a brilliant idea, may affect its transmission into innovation. One interviewee from the e-learning unit, said the sooner one shared the sooner it contributes to innovation. She said that

brilliant ideas should be shared as soon as they have been conceived in the owners mind .She reasons that because there is so much knowledge and information consumed by people today, immediate sharing ensures that such brilliant ideas are put to good use before the donors loose them. Another interviewee from the Centre for Educational Technology said that sharing fresh ideas prevents re-invention of the wheel. He expressed his view in this way:

There are so many projects going on. It's therefore good to know what others are doing. One will then avoid re-inventing the wheel but will do something that is innovative and different from what others are doing. [Int. 7]

However, another interviewee from the middle management pointed out the need to first of all develop a prototype and then start KS. He adds that when KS is started at this stage, it gives them a clear view of what one's concept is and they develop it further. He said that this avoids the wastage of time when people continue holding endless debates about concepts without implementing the ideas. He gave an example of a prototype they had developed that was in the form of a device that assists hypertensive patients to monitor their blood pressure. He said that they developed the prototype and then started sharing their knowledge about it at that stage. He said though the device had not been developed fully, the knowledge they shared with other people later, finally culminated into an innovation.

4.9.3 How Knowledge Sharing Precedes Innovation

Some interviewees likened the process of innovation, to a snowball movement of ideas from one person to another. They said that each time the ideas are passed on, they keep on improving and eventually ideas are turned turn into innovations. One interviewee from the middle management explained this kind of process in the following way:

Somebody comes up with an idea and it is built upon by other people. For example if somebody says, I have an idea that we should do this, this keeps on growing and moving like a snowball from one person to another. This goes on as the original ideas are improved on the way from other people's contributions until, it turns into an innovation. [Int. 15]

Another interviewee from the middle management said that innovation involves casually playing with ideas amongst people until a way forward is agreed upon. He expressed this view as shown below:

We play with ideas as we share them with colleagues. This is more or less knowledge sharing. While doing this sometimes we may agree that this is interesting let's study it a bit more. If someone brings up an idea that becomes interesting for everybody we start to explore it. Through this exploration we come up with an innovation [Int. 11]

Another interviewee from middle management who had been involved in several innovative processes gave her own description in this way: "What starts as a small idea is made bigger when shared with colleagues and eventually turns out to innovation. The original idea doesn't necessarily come from the head of a unit and may therefore not be official" [Int. 4]

Another interviewee from the top management said that in order for KS to lead to innovation, dissenting views should be tolerated. He added that the original owners of seemingly brilliant ideas may have to tolerate modifications to their idea. He said that this should be the case if the original owners of the idea receive contributions from other people whose experience regarding the idea may be beneficial to the development of an innovation. He concluded by suggesting that there should be a lot of commitment towards the end product and willingness to be flexible during the process leading to innovation.

4.9.4 Multi-disciplinary Players for Cross Fertilization of Ideas

Most interviewees pointed out that they had experienced many cases where KS led to innovation that involved cross fertilization of ideas and experiences coming from people who belong to different disciplines. One interviewee said they have always sought to carry out joint projects with people from different disciplines because it is one of the sure ways of coming up with new ideas. This particular interviewee, gave an example of a project, they were about to embark on where they were looking for partners from the environment education domain although they are IT professionals. He said for this particular project, they were seeking for ways in which knowledge from the environmentalists could be cross fertilized with their own knowledge in order to come up with a new application that could be used on I-pods and I-pads. Another interviewee from management, with a similar view said that innovation is mostly realized, when people from research groups that are multi-disciplinary, share ideas. Another interviewee contended that people from the different fields may not necessarily participate in the initiation or even early development of the product but may contribute their views after seeing the prototype to yield a positive impact on the final product of innovation.

This particular interviewee had been involved in the development of a device called Telemedicine that is used by hypertensive patients for communicating their blood pressure levels to their doctors without seeing them physically. He had this to say:

Regarding the Telemedicine device, we had some prototypes and everybody could see it and feel it and felt it was okay. However, someone from a totally unrelated field one time came to our office, looked at the device took it with him and tried to use it. He came back and suggested changes to the product, that changed the device and got it to the final product. I would regard his contribution as knowledge sharing. As a way of KS people from other fields should be brought on board [Int. 5]

The interviewees stressed the need for more collaboration between people of different professional backgrounds in order to realize innovation.

4.9.5 Knowledge Sharing Should Proceed Innovation As Well

Some interviewees suggested that KS doesn't only stop at the realization of the innovation, but is even more important for the application of the innovation in society or the community to which it is intended. One interviewee from the top management pointed out that sharing knowledge should not stop after the innovation has been born. He says it should continue thereafter, to ensure that the intended beneficiaries or users are able to use it and or benefit from it. He maintains that this ensures that the innovation reaches a wider audience and may even be improved in the process. The interviewee expressed his view in the following way: "KS is important for innovation, but even more importantly for the application of the innovation to the people." [Int. 14]

Another interviewee from the middle management agreed with this view, and pointed out that in most cases the innovators are not the end users of the innovation. He added that this fact makes KS after the innovation inevitable and important. In his own words here is what he had to say: "Since the innovators may not be the final users of the product, KS should go on to ensure that the innovations are used or implemented." [Int. 5] Another interviewee from the e-learning unit said KS increases the speed and impact of innovations with the communities for which they are intended.

4.10 Factors Influencing Knowledge Sharing

This section includes factors that affect KS at Tallinn University according to the interviewees.

4.10.1 Incentives

Some interviewees said that in order for KS and innovation to be realized, management should give incentives to staff who endeavor to share knowledge and come up with innovations. They said such incentives would include awards, and prizes to show recognition and appreciation of such efforts. They said that this would motivate other staff to embrace the culture of KS and innovation. One interviewee from the middle management said that these incentives should also be awarded at the institute level to spur KS and innovation within the institutes. Another interviewee, who had participated in several innovations over the years, had this to say: “I got many prizes and awards for innovation and I think the practice should be carried on.” [Int. 8] Another interviewee from middle management with a similar view had this to say: “Innovation should be encouraged by awards; they have tried to set up an annual award. They award the most innovative people. They should continue awarding units and individuals.” [Int. 6] Another interviewee said the prize awarding ceremonies could even serve as sensitization events.

4.10.2 Vertical and Horizontal Communication

Some interviewee said that for KS to be fostered there should be top down communication as well as bottom up communication. They said that KS should transcend hierarchical boundaries. They explained that there should be a free flow of information between the administration and the departments. They said that this kind of communication should be two way. They added that there should be formal mechanisms that ensure horizontal communication between departments. One interviewee said that staff from different departments should hold formal meetings or workshops where they share about their experiences, problems and success in the various projects they undertake. They elucidated that this would inculcate a culture of best practices as departments learn from those other departments that have run successful projects. One interviewee from the middle management

said that such a system existed some years ago, but had since been neglected. In his own words while explaining his claim, here is what he had to say:

Some years back we used to hold such meetings, which involved people from various institutes. In such a meeting if a problem that had been solved by one institute was raised, the institute that solved the problem would share its knowledge with the institute that needs to solve a similar problem. [Int. 12]

Another interviewee from the middle management in support of the aforementioned view had this to say:

Knowledge sharing should be from the top to bottom and from the bottom to top as well. I don't think this happens quite often, at the moments we mostly have the horizontal KS. For example we don't know much about what happens in the senate and the rectorate. We should learn more about their plans and process to be able to give feedback before they are implemented. [Int. 4]

One of the interviewees, however, had a different view from the one presented above. She said the university was innovative because there were no hierarchical barriers for communication. In her own words she said: "We have very liberal inter-relations among working groups that help to involve people without hierarchical constraints." [Int. 3]

All the above mentioned interviewees agreed that easiness with which information flows downwards, upwards along the hierarchy, horizontally across departments, and within departments' impacts on KS in the university. The more information flows along these channels the higher the chances of KS.

4.10.3 Commitment from Management

Some interviewees said that management should show commitment to the practice of KS and innovation. They added that management should sponsor programs that support KS. They further urged that members of management should openly encourage KS in their formal communication. One interviewee said that management should lead by example. They should be willing to share knowledge in order to convince others that it is important for innovation. One interviewee from the top management agreed with this view and said that he had always submitted his work to the Creative Commons License in order to let others share it. According to him, all members in management should show interest in the practice of KS. Another

interviewee mentioned that management should include KS activities in its strategic plans. Another interviewee asserted that being exemplary and showing commitment to the cause of KS and innovation should not stop at top management but even more importantly the middle management should act likewise. This particular interviewee from the middle management said:

The level of innovation very much depends on the head of the institute because, if the head is positive towards innovation, then innovation will take place. If there're institutes with no innovations and they have done the same things for years, I would say it very much depends on the director of the Institute. If the director participates in knowledge sharing and is innovative then the people in the institute would follow him or her. [Int. 12]

He further stressed that the institutes' strategic plans should also have included some KS activities in order to show commitment and encourage staff to embrace the practice. Another interviewee emphasized the issue of including KS in the strategic plan. In his own words he had this to say: "Knowledge sharing should be made a priority and included in the strategic plan. Management can ensure that this is done to foster knowledge sharing." [Int. 11] All the above mentioned interviewees felt that both the top and middle management can play a big role in supporting KS at Tallinn University.

4.10.4 Social Meeting Places

Some interviewees reasoned that since some KS takes place when colleagues meet in social places, the availability of such places matters. One interviewee from top management said that the social common places where informal KS takes place are important. He added that management had put this into consideration during the design of the new building structures at the university. He elaborated his claim as follows:

We instructed the architects of the new buildings to make sure there're social rooms for people to meet and carry out informal interactions. We are looking at this not just for our staff, but also for students. People should be able to sit in these rooms communicate, take coffee and so on. We are also trying to set up a park for people to meet informally, in a relaxed atmosphere to share knowledge. We are thinking about such kind of physical environment for this kind of knowledge sharing. [Int. 14]

Another interviewee from the middle management who suggested that staff should have exclusive cafeterias said people should be put in a situation where they can meet each other.

He added that people tend to discuss all kinds of things during coffee time including work related knowledge. He also suggested that the common places should be organized in such a way that people use a common entrance to access them. He supports his argument by reasoning that this would enable people to see each other quite often and therefore discuss more often. He elaborated that the presence of an individual invokes an idea to share with them. Some of his own words, were as follows “It’s not only about organizing people, it is sometimes about organizing places. As they do the renovation, I think it’s important for the main campus to include such places.” [Int. 5]

Another interviewee with a similar view about the social places, even suggested that the cafes set up should have limited number of seats such that people get to seat next to each other. He said that people who are next to each other are bound to talk to each other and share knowledge. The analyst also found information supporting informal social gathering on the university website. Written in form of a statement from one of the university’s top officials, it is written that “*After all, in the university we are among colleagues and friends. And in this sense, university quickly becomes a way of life, the habit of discussion sticks and conversations spread from classrooms to cafes and from seminars to informal get-togethers of all sorts*” (“Rector’s Message”, n.d., para.3). The analyst also conducted 4 interviews in one of the social meeting places.

4.10.5 Organizational Culture

Most interviewees said that KS geared towards innovation depends a great deal on the organizational culture of the university. Some said that a friendly environment should be fostered in order to build relationships and trust among staff. They asserted that these are essential ingredients for KS. One interviewee had this to say: “One of the reasons we collaborate easily is because people in our university are friendly and are willing to help.” [Int. 8] Another interviewee from the middle management said people should be friendly and there should be mutual respect between staff for effective KS. She said sometimes the academic staff are a little bit condescending towards staff from administrative units. In her own words she said: “The organizational culture should ensure that people are united and respect staff

from other departments, be it academic or administrative departments.” [Int. 4] Another interviewee from the top management, aired out a view that is related to the issue of academic and administrative staff not sharing knowledge between each other. In his own words here is what he had to say: “People share knowledge more easily when they are doing the same thing. For example, academic staff with fellow academic staff. This is why we sometimes have problems of communication between academic persons and administrative staff.” [Int. 14]

Another quality that people at the university should possess was given as, having members of management who are open minded and are willing to tolerate mistakes made by others. It was mentioned that such an atmosphere will encourage staff to be willing to take risks and try out new things which may eventually lead to innovation. One interviewee from the middle management had this to say:

Not every innovation will be positive or successful. Innovation means doing something one hasn't done before. This therefore means that people are bound to make mistakes. The role of a leader should be to encourage such people to keep on trying and show them that failure is tolerated. [Int. 12]

Another interviewee from the top management with a similar view had this to say: “We need to support them; we need to be very open minded. If there are initiatives, we should support them while encouraging them to take risks as we tolerate failure.”[Int. 14] One interviewee said the organizational culture should entail an environment where people like to work and feel their creativity is supported. He adds that there should be less bureaucratic tasks for staff. He also said that the work routines and processes should be flexible.

The analysts found information on the university website supporting this view of flexibility. These words are part of a statement by one of the staff from the top management. It is written that “*We also believe that one does best what one does knowingly and of one's own free will. This is why we have structured our degrees so that they would give maximum freedom to the learner as well as to the teacher – students at Tallinn University are guaranteed significant freedoms in designing their study plans and selecting their subjects, while faculty members are expected to teach courses related to their particular fields of expertise and relevant to their own current research, rather than to repeat from year to year the same lectures that are prescribed by a petrified syllabus*” (“Rectors Message,” n.d., para. 4).

Most interviewees felt organizational culture defines the behavior of staff and this consequently impacts on their ability to share knowledge and participate in innovations.

4.10.6 Sensitization

Some interviewees said staff need to be sensitized about KS. One interviewee said that people have a lot of information to share but should be sensitized on how, where, and when to share it. She said some people are very knowledgeable but have no idea how to share their knowledge with other colleagues. Another interviewee from the top management said that the sensitization should not only be limited to urging staff to share knowledge, but should also include telling them the benefits of KS. This particular interviewee had this to say:

We have to explain to our colleagues about the benefits of sharing and distributing knowledge to other people. For example, knowledge sharing involving one's research work make enhances the visibility of one's work and creates a better impact on the world but some people may not be viewing it in that perspective. [Int. 9]

Another interviewee from the middle management said that KS should be explained to staff continuously because it is not static. She added that the ways in which we share, the knowledge we share and the people we share knowledge with keep on changing. Some of her own words were "Explaining knowledge sharing to colleagues should be a continuous process because knowledge sharing isn't static. We have new institutes that have just merged and they don't have each other's previous knowledge." [Int. 4] The interviewees said sensitization can be done in various forms including through workshops. One of the interviewees had this to say: "Actually the more you talk about it and make these events about innovation and KS the more people learn about it and practice it. Such events could be workshops or conferences" [Int. 2] When asked whether staff at Tallinn University shared knowledge, most interviewees answered in the affirmative, but said that they could do better.

4.10.7 Policy on Open Access

Some interviewees said that the encouragement of open access fosters KS. One interviewee added that it promotes the culture of sharing which yields positive results for KS. Another interviewee wondered why learning materials were always uploaded in IVA or Moodle (learning management systems) that need passwords to access instead of letting them freely available for anyone to access. This particular interviewee claimed that the most innovative universities let access to their materials in open access platforms. He said this practice inculcates a sense of sharing instead of hoarding knowledge. He cited Massachusetts Institute of Technology and Stanford University in the United States as examples of universities that practice open access and at the same time are very innovative. Another interviewee who had a similar view about open access said open access boosts one's visibility. In his own words he said: "My motivation for open access is to let people know who I am and what I am doing and for the same reason I am always ready to share my knowledge." [Int. 8]

The interviewees in support of the open access culture however, acknowledged that the copyright problem sometimes becomes stumbling block in the open access endeavor. One interviewee said that having a policy which automatically awards the copyright of learning and teaching materials to the university was counterproductive. He said it would have been better if such work was included under the creative commons attribution shared license.

Lack of interest in the open access initiatives was also attributed to the fear of criticism. Some interviewees said that some people may not be so sure of the quality of their work and therefore would hesitate to let it in the public sphere. They said that this happens because the owners of the work fear their work will be scrutinized and criticized.

4.11 Discussion and Relationships to the Literature

This section presents the discussion of findings based on relationships, similarities or dissimilarities between what theory proposes and what the analyst gathered from the interviews, document analysis and observations during the study.

4.11.1 Perception of Innovation by Staff at Tallinn University

The perception of innovation by some interviewees was characterized as something new. This is consistent with the reviewed literature (for example, Chen et al., 2004; Plessis, 2007; West & Farr, 1990; White & Glickman, 2007). Interviewees especially from IT oriented units also defined innovation as redesigning something that is already in existence. This is no different from what Gloet and Terziovski (2004) termed as incremental innovation. These authors classified innovation into two forms namely radical and incremental innovation. They elucidated that incremental innovations present themselves as line extensions or modifications of existing products. They urge that incremental innovation does not require significant departure from existing business practices and is therefore likely to enhance existing internal competencies by providing the opportunity to build on existing know-how. The interviewees' description of innovation as something new fits Gloet and Terziovski's (2004) concept of radical innovation. According to the authors, radical innovations are considered crucial to long-term success as they involve development and application of new technology, some of which may change existing market structures.

Some interviewees pointed out, that innovation should be of value or benefit to the audience for whom it is intended. This assertion is consistent with a similar claim made by West and Farr (1990). These authors point out that innovation should have the characteristic of benefiting the individual, the group, the organization or wider society.

White and Glickman (2007) contend that innovation as perceived in other fields is not significantly different when considered in the field of higher education. These authors contend that in the field of higher education innovation can refer simply to "some new ways of doing things or a change that improves administrative or scholarly performance or a transformational experience based on a new way of thinking" (p. 97). This is consistent with how some interviewees defined innovation. The interviewees cited the development of a new curriculum and making significant changes in management as some of the examples of innovation which fit White and Glickman's assertion of innovation in higher education. The reviewed literature (for example Educause, 2010; White & Glickman, 2007) put a lot of emphasis on the

influence of IT on innovation in higher education. This, however, was not highlighted by the interviewees while describing their perception of innovation.

4.11.2 How Staff at the University Share Knowledge

Interviewees mentioned meetings, workshops, seminars and conferences as some of the forums in which KS occurs. Such forums were classified as formal KS by Taminiau et al. (2007). According to the authors, formal KS comprises all the forms of KS that are institutionalized by management. They cite meetings and brain storming sessions as some of the examples of formal KS. The study of KS in higher education by Sohail and Daudi (2009) showed that KS could be enhanced if the university administration plays a positive role by encouraging their staff to share knowledge through open discussions, forums, seminars and colloquiums. According to Nonaka (1994), formal exchange mechanisms, such as procedure, formal language, and the exchange of handbooks will ensure that people will exchange and combine their explicit knowledge. Although the interviewees reported the sharing of knowledge through formal means, there were no formal institutional structures dedicated to knowledge sharing. This is different from what previous studies showed (for example, Cranfield and Taylor, 2008; Kidwell et al., 2001) that universities have set up departments dedicated to the facilitation of KS and KM.

According to Ives et al. (2003), if KS is normal and a daily part of the job then it is likely to occur. This resonates with the interviewees' accounts about sharing knowledge on a daily basis in office. The interviewees said they also use information technology applications for KS. They cited blogs, wikis, e-mail, concept maps and social networks as some of the applications used for KS. This is in line with previous literature (for example, Ives et al., 2003; Peariasamy & Mansor, 2008; Hans & Anantatmula, 2007; Adhikari, 2010; Kidwell et al., 2001). These authors highlight the role of technology in the implementation of KS in organizations. Literature however, doesn't highlight the role of non digital tools such as those cited by the interviewees. The non digital tools that were mentioned in the interviews include white boards and card sorting.

The interviewees said that they also share knowledge informally. They explained that this always happened in common places such as cafeterias and restaurants. This is consistent with the following authors' assertions (Werr & Sjernberg, 2003; Taminiau et al., 2007; Sturdy et al., 2006; Swap et al., 2001; Truran, 1998; Krogh et al., 2000; Ives et al., 2003). Literature links informal KS to informal networks and informal communication (Awazu, 2004; Bensen et al., 2003). Swap et al. (2001) suggest that often inter-organizational knowledge is unconsciously shared by employees, incorporation having unconsciously taken place through informal interaction. This implies that the sharing of knowledge can also take place even where there is no specific intention to do so. Truran (1998) suggests that intra-organizational communication has changed tremendously. He states that half of the knowledge sharing is taking place through informal channels ("ad hoc channels") for example through a telephone or mail. Krogh et al. (2000) also found that the greater part of KS takes place informally, even in organizations in which KS is highly institutionalized. Ives et al. (2003) claim that many organizations are beginning to recognize the need to create environments for example quiet space, informal environments, and relaxed physical environments enhanced with technologies that are appropriate for KS.

The authors claim that much KS occurs without the use of technology, some of it is not by design. The sharing of best practice can occur in the coffee room or by the copy machine. However, many organizations are employing team spaces and scheduled team KS meetings to allow for these exchanges.

4.11.3 Using Face to Face Vs Technology Tools for Knowledge Sharing

The interviewees reported that face to face KS had a greater impact than the use of information technology tools for KS. This is consistent with the study carried out by Dutton and Starbuck (1979) whose results showed that face to face meetings were more effective in sharing computer simulated technology than exchange of documents, manuals, and correspondences. Davenport and Prusak (1998) noted that sometimes knowledge transfer can only work if the various parties are brought to gather physically. The underlying logic is that

parties draw upon social capital embedded within the group relationship to facilitate KS (Cummings, 2003).

4.11.4 How Knowledge Sharing Contributes to Innovation

All interviewees agreed that KS leads to innovation. This is consistent with previous literature that shows that KS is closely related to innovation (Nonaka, 1991; Nonaka & Takeuchi, 1995). Kamasak and Bulutlar (2009) point out that in order to learn new knowledge individuals should interact and share implicit and explicit knowledge with each other. Knowledge dissemination and responsiveness to knowledge in other words KS have been put forward as the two most important components impacting upon innovation due to their ambiguous and unique nature within the firm (Teece, 1998; Grant, 1996; Day, 1994). Ambrosini and Bowman (2001) contend that the KS process facilitates knowledge sharing. They maintain that the constant interaction between tacit and explicit knowledge leads to the developments of new and innovation ideas.

Previous studies on innovation support the relationship between effective KM and innovation (Smith et al., 2005; Darroch & McNaughton, 2002; Dougherty et al., 2002; Hargadon & Sutton, 1997; Nonaka & Takeuchi, 1995). For example Dougherty et al. (2002) assert that innovation relies heavily on the accumulation of new knowledge in an organization, which facilitates creative solutions. Hargadon and Sutton (1997) contend that when knowledge is shared among groups within the organization, existing ideas from one group appear novel to another and vice versa, resulting in potentially new products or services. This is in line with the interviewees' accounts about cross fertilization of ideas between colleagues from different professional backgrounds. The interviewees argued that in order to realize innovation, it was vital for staff from a particular discipline to share knowledge with other staff from different disciplines. They explained that when ideas coming from the different groups are combined, an innovation is easily born. In support of this view, Donofrio (2006) maintains that innovation has to be more multi-disciplinary with collaboration among experts from many different backgrounds.

Findings from the study of Kamasak and Bulutlar (2009) about KS and innovation show that KS has a significant effect on both exploitative and exploratory innovation. It is implied that innovation can be achieved through two distinct strategies, namely exploitation where exploitation is making use of existing opportunities and exploration which involves the search for new ones (Schulze et al., 2008; Tushman & O'Reilly, 1996; March, 1991). According to some interviewees, sometimes they move out of the campus walls in search for joint innovative ventures with people in the industry and private sector. A case in point is when one interviewee said they were about to begin a joint innovation project with Tallinn Zoo. An innovation culminating from such a venture where one first of all shares knowledge with professionals outside one's own realm would be classified as exploratory innovation according to Kamasak and Bulutlar (2009).

On the other hand, some interviewees reported that most of the innovations have been carried out with colleagues in their own departments and these would be classified as exploitative innovation. It is therefore justifiable to conclude that the staff at Tallinn University conduct exploitative innovation when they share knowledge with people in their own departments, and exploratory innovation when they share knowledge with people outside their own realm. Most of the previous studies that were reviewed in the literature (for example, Taminiu et al., 2007; Kamasak & Bulutlar, 2009; Hargadon & Sutton, 1997) don't highlight the importance of KS after innovation has been realized. The emphasis is on the process that precedes innovation. This is a bit different from what the interviewees reported about KS preceding innovation. The interviewees reported that as much as KS leads to innovation it also facilitates its implementation.

4.11.5 Factors Influencing Knowledge Sharing at Tallinn University

This section presents discussions about the factors that affect KS at Tallinn University as communicated by the informants.

4.11.5.1 Organizational Culture

Some interviewees said the organizational culture is an important factor to consider for the fostering of KS at the university. They cited trust and friendliness as some of the necessary virtues to facilitate the culture of KS. This is consistent with the assertion made by various authors (Ives et al., 2003; Peariasamy & Mansor, 2008; Cummings, 2003) that trust is essential for KS in an organization. For example, Peariasamy and Mansor (2008) contend that trust is an important facilitator in communication, and enables one to be more willing to engage in KS. The research of Han and Anantamula (2007) about the factors of KS in two large IT organizations, showed that the organizational factor which was construed as organization culture and employees trust among themselves played a major role in KS at the organizations. Some interviewees in this study also reported that vertical and horizontal communication were important factors affecting KS at the university. They said that the easier the communication vertically and horizontally the more KS. This is similar to the study that was conducted by Ives et al. (2003) that showed that the practice of KS is likely to thrive more in a relatively flat organization that centers around functional or project teams with no hierarchical boundaries to communication.

4.11.5.2 Incentives

Some interviewees said that the offering of incentives to staff for them to participate in KS and innovation was an important factor to consider for KS at the university. This is similar to what Ives et al. (2003) suggested that KS is best supported by intrinsic rewards for example, saving work time, participating in useful, and interesting dialogue or professional pride in being recognized as an expert. Offering awards and prizes, fulfils the requirement of recognition as a means of motivation for those who engage in KS and innovation. According to Adhikari (2010), it is necessary to facilitate knowledge growth through culture and incentives. Such growth of knowledge provides soft form of incentives to reinforce KM initiatives at the institution. He maintains that incentives help to reinforce best practices and at the same time to instill a shift in behavior. He asserts that incentives should be based on annual performance review of faculties and staff on the basis of their contribution to the institution's knowledge.

4.11.5.3 Social Meeting Places

Most interviewees reported that the availability of social common places for informal gathering was an essential factor for KS. They said that they participated in informal KS unwittingly in such places. Swap et al. (2001) suggest that often inter-organizational knowledge is unconsciously shared by employees, incorporation having unconsciously taken place through informal interaction. This implies that the transfer of knowledge can also take place even where there is no specific intention to do so. The interviewees cited restaurants and cafes as some of the places where such KS took place. Their assertion about informal KS in such places is in agreement with previous studies (Ives et al., 2003; Han & Anantatmula, 2007; Taminiau et al., 2007; Sturdy et al., 2006). These authors urge that much KS takes place in informal settings. Taminiau et al. (2007) carried out a study about KS and its influence on innovation among consultants. The results of the study showed that much of the KS took place during informal gathering when the consultants were having meals or casually chatting. According to Han & Anantatmula (2007), physical locations for informal gathering encourage social interactions which foster KS among staff. Ives et al. (2003) claim that much KS occurs without the use of technology, and some of it is not by design. They assert that the sharing of best practice can occur in the coffee room or by the copy machine. However, many organizations are employing team spaces and scheduled team KS meetings to allow for these exchanges.

4.11.5.4 Commitment from Management

Most interviewees pointed out that commitment from management is essential in fostering KS at the university. Some said management had not showed much commitment towards the practices of KS. This factor is supported by Ives et al. (2003) stating that steps to a achieving a KS culture includes: setting KS priorities, strong KS leadership, modeling by senior leadership through visible advocacy of KS behavior and KS investment support. Han and Anantatmula (2007) contend that KS thrives in organizations where managers are willing to share knowledge with the junior staff. Their study further showed that management can show commitment to KS by allocation of resources to support the sharing of knowledge. The study findings implied that leadership that encourages KS would allocate resources to support the

sharing of knowledge. In other words the leadership would support their employees by allocating paid hours and funds for training courses, conference attendance and purchase of technology to support KS.

4.11.5.5 Sensitization

Some interviewees said that sensitization is essential for KS to improve at the university. One of the interviewees said that people have a lot of knowledge to share but should be sensitized on how, when, and what to share. This view is similar to what was expressed by Ives et al. (2003) pointing out that, given that KS is a new behavior to many organizations, guidance is needed to achieve enhanced value. They stress that guidance is needed in terms of the contextual awareness, abstraction of what to share, when to share, how to share, why to share, and whom to share it with. The authors infer that guidance of this kind given in the context of daily work processes is especially useful to KS. The authors further claim that it is important that everybody knows where and how to contribute to knowledge and what happens after their contribution is made. The authors further state that it is important to integrate KS training within the entire array of training initiatives.

4.12 Conclusion

This chapter presented the findings of the study. First, the institutional background information provided an overview of the context of the case. The findings showed that the interviewees regard innovation both as something new and as something that has been redesigned from its original state. The chapter also highlighted the questions of how, with whom and where staff share knowledge at the university. The findings showed that apart from the use of face to face communication, staff also use both digital and non digital tools for sharing knowledge. It was noted by some interviewees that more KS takes place among employees in the same department than happens across departments. The findings demonstrated that KS not only contributes to the realization of an innovation but continues even after the production of the innovation to effect its implementation or its adoption. The factors that the interviewees communicated as affecting KS have also been presented. Finally,

the discussion of findings in relation to the literature review in chapter 2 was also provided. In order to provide a general conclusion to this thesis, the next chapter presents the conclusions to the research questions, practical and theoretical implications, and directions for further research.

CHAPTER 5: CONCLUSION AND RECOMMENDATION

The final chapter comprises conclusions and suggestions based on outcomes of the analysis. Thus, concluding remarks are made to the research problem, research questions and implications for theory and practice together with suggestions for future research initiatives. In accordance with what Yin (2009) describes, this study constitutes a qualitative nature and should therefore not be seen as any attempt to generalize any of the findings presented. This way findings may also be worthy of study in other settings in succeeding research attempts.

5.1 Conclusions about Research Questions

This study is concerned with providing answers to the research questions that were derived from the research objectives that were stated in Chapter 1.0 section 1.3.

5.2 Perception of Innovation

This section aims to answer the research question 1 based on presentation in the previous chapter.

Research question 1

- How innovation is perceived at Tallinn University?

The findings showed that the interviewees perceived innovation mainly in two different ways namely:

- as something new that never existed before and
- as something that was already in existence but has been redesigned.

The interviewees stressed the fact that innovation should not only be tied to new products but should be understood to include new processes and services. They said innovation could mean the introduction of a new course, development of a new curriculum or change in management style. They inferred that innovation of tangible new products is as important as the innovation of new ways of doing things. They said that the transformations in the way things are done after the introduction of a new technology is equally an innovation, just as the new technology that causes such transformations. Some interviewees who had been involved in the innovation of commercial products in collaboration with industry said innovation should be something

that can be sold. They added that innovation should have a monetary value. One of them simply put it that innovation is transferring one's theory into something that can be sold. The interviewees said innovations should make a positive impact to the audience for which they are intended.

5.3 How Knowledge is Shared

This section aims to answer the research question 2 based on the presentation in the previous chapter.

Research question 2

- How staff at Tallinn University within innovative initiatives share knowledge?

Interviewees identified a wide range of ways in which they share knowledge. These can be classified into formal and informal KS.

Formal Knowledge Sharing: The interviewees reported that they shared knowledge in formal meetings, seminars, conferences, dissemination sessions, and workshops. They also mentioned that knowledge is shared through collaboration with colleagues while writing research papers and grant proposals. The interviewees said that they also shared knowledge with colleagues with whom they work on a daily basis in their offices. It is worth noting that most of the interviewees who made this admission shared one big room with colleagues as an office space. These interviewees sat in close proximity to each other although each of them was stationed at their own desk. Working in teams, and formation of networks was also mentioned as one of the ways in which staff shares knowledge.

Informal Knowledge Sharing: The interviewees mentioned that they shared knowledge in informal settings although this was done without prior meditation or intention. They said that such KS took place in restaurants, and cafes while they had meals with colleagues or during coffee breaks. Some interviewees said this was the best way to get people to share their experiences or innovative ideas.

Tools: The interviewees mentioned several online tools they used for KS which included Weblogs, Wikis, Mendeley, Flickr, on line Social networks, E-mail, Skype, and Concept maps. Much of the knowledge that is shared on such networks is in form of electronic documents and concepts. The analyst therefore classified knowledge that is shared along the online tools as explicit knowledge. Some interviewees also mentioned that they share knowledge using non digital tools such as Card Sorting and White Boards. They said such tools were mainly used for sharing raw ideas about a particular concept.

Most interviewees said that they do not only share knowledge with colleagues at the university, but also with staff from other universities locally and internationally. They said that in this way they were able to share best practices with colleagues. Some interviewees said that they also shared knowledge with professionals of different professional backgrounds especially from the private sector and industry.

5.4 Contribution of Knowledge Sharing to Innovation

This section aims to answer the research question 3 based on the presentation in the previous chapter.

Research question 3

- How KS would contribute to the success of the innovative initiatives?

Most interviewees emphatically agreed that KS leads to innovation. They said that sharing knowledge draws other people's input towards the development of new concepts that eventually turn into innovation. Most interviewees said that they had participated in these initiatives and reported that KS was vital in the realization of the innovative initiatives. Some informants mentioned that in order to achieve innovation knowledge should be shared as soon as possible after it is constructed. They advised that when one conceives a brilliant idea, they should share it with others immediately instead of waiting or procrastinating. They reasoned that one can easily forget to share such ideas due to other engagements. The interviewees also suggested that once KS is initiated the participants shouldn't wait too long to turn the innovation into a prototype. They said that KS even works better at a prototype stage. They

argued that people will be more willing to contribute towards an ongoing innovation process after viewing or understanding the prototype.

Some interviewees explained how KS precedes innovation. They likened the process to a snowball movement of ideas from one individual to another. They said the ideas are improved with time as the process goes on and more participants are involved. The interviewees though cautioned that the original owner of the idea should be willing to accept dissenting views however brilliant the original idea may seem. They said that focusing on the end product, enables one to tolerate other people's views that are contributed towards that innovation.

Some interviewees pointed out that the need to share knowledge with people of different professional backgrounds in order to come up with innovations. They mentioned that getting people of different professional backgrounds to share knowledge enables a cross fertilization of ideas. They said that what looks novel to one group, may seem usual to another and when the two groups interact and share knowledge, a hybrid of their knowledge is what constitutes an innovation.

The interviewees reported that as much as KS makes a significant contribution towards the realization of an innovation, it also contributes to the fulfillment or implementation of the innovation. They said that KS should not end at the process of innovation, but should be continued to facilitate the usage of the innovation by its intended beneficiaries.

5.5 Factors affecting Knowledge Sharing

This section presents the conclusions about research question 4 based on the presentation in chapter 4.

Research question 4

- What factors influence KS at Tallinn University?

5.5.1 Organizational Culture

Some interviewees pointed out that in order for KS to thrive at the university, the staff should be friendly to each other. They said that trust among staff should be upheld as a necessary virtue at the institution. They maintained that laying a foundation of friendship and relationships among staff that are based on trust were essential in fostering KS at the university. They also noted that communication among staff should transcend hierarchical boundaries similar to the kind of communication in a flat organization. They added that the organizational culture should be one that tolerates mistakes and encourages risk taking among staff. They felt that in this way staff wouldn't be afraid to try out new innovations that are developed through KS.

5.5.2 Incentives

The interviewees said that staff need to be motivated to share knowledge and to participate in innovative initiatives. They said that management should continue with the practice of recognizing the most innovative staff members through giving them awards and prizes. They noted that the incentives should also include providing financial support for innovative initiatives. They said that the incentives should be given at both individual level and institute level.

5.5.3 Social Meeting Places

Some interviewees said that the availability of social meeting places was vital in creating conducive environment for KS. They mentioned restaurants and cafeterias as examples of such places. They said that they always share knowledge in these informal settings without even planning for it. They said such informal gatherings were a good way of letting people share their experiences. Most of the tacit knowledge is shared during such informal conversations since KS in such settings usually takes place in form of dialogue. The university management had included spaces for informal gathering in the construction of a new building at campus.

5.5.4 Commitment from Management

The interviewees reported that management should show commitment to the cause of KS in order for the behavior to thrive. They said that management can show their commitment by first of all leading by example. It was mentioned that members of management should continuously share knowledge with staff in order to foster the behavior. It was pointed out that KS should be included in the institutions strategic plan to show that management appreciates it and is committed to the cause. Its inclusion in the strategic plan will go a long way in highlighting the value that management attaches to KS. The interviewees further suggested that management can also show commitment by offering financial support and paid hours for people to engage in KS activities like attending conferences, workshops and seminars.

5.5.5 Sensitization

Some interviewees said that it is important to sensitize staff about the benefits of KS. They said the sensitization should also include training staff about what to share and how to share knowledge. They said the sensitization can be done during workshops or during award giving ceremonies for the most innovative staff and institutes. It was pointed out that some staff may be aware of the benefits of KS but may take it for granted. In such cases sensitization would be essential in helping such staff realize that KS should be part of their daily work routines.

5.6 Conclusion about the Research Problem

As reflected in the problem statement in Chapter 1, section 1.2 the system of higher education is undergoing heightened evaluation and reform in a number of countries. As one of the measures of responding to these pressures, universities practice KS.

This study sought to investigate whether KS is practiced in higher education for the sake of creating competitive advantage through innovation and how this is done. The results have showed that indeed, the staff at Tallinn University have adopted KS and are conscious about its benefits. The findings indicate that KS has contributed to innovation at the university. KS at the university doesn't only happen between the staff with fellow staff at the same university

but also with staff from other universities and from the industry or private sector. One of the main ways innovation is achieved is by sharing knowledge with professionals of different backgrounds thereby leading to cross fertilization of ideas. This indicated that the university has created its own competitive advantage through innovations and the whole process was supported by KS.

5.7 Implications for Theory and Practice

Previous studies (for example, Cranfield & Taylor, 2008; Kidwell et al., 2001) have sought to find out whether the higher education sector is ready for KM and KS. This study contributes to research by answering questions posed earlier researchers concerning KS and higher education. The results of this study have shown that Tallinn University is practicing KS however; there are no existing formal structures to support the behavior. All the informants indicated that they share knowledge although they all said that KS can still be improved at the university. Taminiau et al. (2007) conducted a study to determine whether KS leads to innovation among consultants. This study has demonstrated that as much as KS contributes to innovation in the business world, KS is also vital in fostering innovation in higher education. White and Glickman (2007) pointed out that innovation as perceived in other fields, is not significantly different when considered in the field of higher education. The findings of this study have re-affirmed this notion as shown above that the staff at the university perceived innovation as had earlier been defined by researchers in other fields.

The findings of this study will be useful to universities, research institutions, and other organisations whose objectives include innovation. The results showed that KS contributes to innovation at Tallinn University. In order to improve the behaviour of KS though, there should be more interaction and collaboration among staff from different institutes and departments. Including the KS activities in the strategic plan of the university, will improve the practice at the university. The university should not become complacent in its pursuit of innovation. The management should show more commitment by soliciting for and providing more financial support towards innovative initiatives. All departments should participate in the dissemination

sessions to let others benefit from best practices gained from projects or innovation implemented by other departments.

5.8 Limitations

All studies are bound to have some limitations and this study is no exception to such a rule. Given that this is a case study research which was conducted with a small sample size based on snowball sampling, it would be challenging to make comparisons to different contexts. However, using a qualitative approach the aim has not been to generalize findings. Instead the general concern for initiating this work has been and still is, to enrich the presumptive reader with a greater understanding of how KS fosters innovation at Tallinn University. Comparisons with other contexts should only be done after taking into considerations, the similarities between the receiving context and Tallinn University. In order to facilitate transferability of findings, the researcher collected sufficient data in detail about the case and the phenomenon under study. The study was focused on KS among staff at the university and didn't include students as subjects of the study.

5.9 Direction for Further Research

The literature review showed that little research about KS had been done in the field of higher education. This therefore calls for more research to be conducted in this area. It would also be interesting to conduct a study aimed at investigating the role of KS in fostering innovation specifically among university staff and professionals from the industry. In this case the professionals from the private sector would also be included as subjects alongside the university staff. Research on the impact of leadership on the innovation capability of a university is also an interesting avenue for more research. The investigation of why some institutes continuously outperform others in innovations at the university would also provide an interesting research area.

5.10 Conclusion

The first chapter of this thesis began by giving a brief background to the study. The statement of the problem, the research aims and the research questions were presented in the same chapter. The significance of the study, a brief summary for the methodology and the definition of key terms were also given in chapter 1. Finally, the delimitation of the study and the outline of the thesis were also presented.

The second chapter provided the literature review about topics that were deemed vital to the study. The review started by highlighting the different perceptions and classification of the term knowledge that were given by previous researchers. The debates surrounding KM were also pointed out, and the concept of KS and the factors that affect KS were discussed. This chapter also highlighted studies about KS and KM in higher education that were conducted by previous researchers. The concept of innovation, innovation in higher education, and the previous research about the influence of KS on innovation were discussed in the same chapter.

Chapter 3 presented the methodology and research paradigm that was followed while conducting the research. The method, data collection techniques, the sampling criteria and the data analysis approach were all given along with the reasons as to why they were chosen over others.

Chapter 4 presented the findings of the study along with the discussion that related the results to the literature in chapter 2.

This final chapter provided conclusions to the research questions and the limitations of the study. Implications for theory and practice and the directions for further research have also been presented in this chapter.

The literature review showed that very little research had been done about KS and higher education. Most of the earlier research about KS was done in the business or industry sector and not in higher education. In the databases that were searched, there was no research

conducted about the influence of the KS on innovation in higher education. This research has therefore filled the research gap that had been left by earlier researchers.

According to the informants, staff members who are involved in the innovative initiatives at Tallinn University share knowledge but they also acknowledged that they can do better. They said they that they did not only share knowledge with colleagues at the university but also shared knowledge with colleagues from other universities and professionals in the private sector. The interviewees also revealed that they shared knowledge in different ways which included face to face communication, using digital tools and by use of non digital tools. Most interviewees' perceived innovation mainly as something new that never existed before, but also as something that has been redesigned or modified from its original state. The findings showed that innovations in form of new products are as good as innovations in form of new processes. The informants said that they had participated in innovative initiatives and witnessed the contribution of KS to the realization of innovations. They said that KS should not stop at the production of the innovation but should be continued up to the implementation or adoption stage of the innovation.

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APPENDICES

Appendix 1: Interview Guide

The role of Knowledge sharing in fostering innovation at Tallinn University: a case study.

Perception of innovation

1. How would you define innovation in your own words?

How Staff share knowledge

2. In which ways do you share knowledge at the university?

3. Have you been involved in any innovative initiatives at the university?

4. If your answer above is yes would you say that you always shared knowledge with the people you worked with in realizing the innovation? And if the answer here is yes, how did you share knowledge with your colleagues?

5. Are there any particular tools (technology or otherwise) that you and your colleagues used for sharing knowledge during the innovation process? if there're please mention them. (The technology here may mean but is not limited to social networks, web.2.0s, etc)?

How KS leads to innovation

6. According to your experience do you think knowledge sharing contributes to the success of innovation in Tallinn University, and if you think so, can you please explain how this happens?

Factors affecting KS

7. What do you think are the factors that affect KS at the university?

8. What should be done to improve KS at the university?

9. Is there any other suggestion you would like to add that you feel we have not touched regarding the subject?

Kindly nominate one other person that you think can contribute to this discussion among your colleagues.

Thank you very much for taking part in this interview and for contributing to this study.