ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
SCHOOL OF INFORMATION SCIENCE

KNOWLEDGE SHARING AMONG EMPLOYEES OF MESFIN INDUSTRIAL ENGINEERING

HAREYA G/SLASSIE

JULY 2011

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A Thesis Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Master of Science in Information Science

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_____	Examiner	_____	_____

DEDICATION

This work is dedicated to the Lord of Lords, King of Kings, and the merciful one Jesus Christ, for being my strength when I get weak; my inspiration when I lose passion and my joy when nothing makes sense throughout my journey.

ACKNOWLEDGEMENT

My special gratitude goes to my advisor Ato Getachew Jemaneh and I would like to appreciate you for shaping and guiding my thoughts and steps on the right track through your insightful comments. I also want to admire your diligence, on time response and encouragement.

My dearest family as a whole, and Dr. G/Yohanns and Dr. Solomon, I would like to thank you for the moral, financial, material and psychological support that you have done for me till the end of these two years.

My friends, I would like to thank you for your moral support and encouragements throughout my study.

At last but not the least, I would like to thank my boy friend Master Girmay Berihu for his continuous psychological and financial support.

The research was financially supported by the School of Graduate Studies, A.A.U, for which they should deserve great credits.

Abstract

Knowledge has been recognized as an important asset for sustaining competitive advantage. Recently, organizations, such as those in academics and business are turning to the use of the intangible intellectual source of economy, which is knowledge, in order to be competitive over the world. Therefore, to be competing needs to acquire, utilize and share knowledge. Sharing knowledge is the main backbone of knowledge management, because having knowledge is meaningless unless it is shared and allowed it to be used by others.

The study investigated the knowledge sharing culture among employees of Mesfin Industrial Engineering (MIE). In addition, the study identified factors that affect knowledge sharing and mechanisms of knowledge sharing in the organization. Finally, the study came up with the possible models of knowledge sharing which could enhance the performance of the organization.

Mixed method of data collection, which employs both quantitative and qualitative methods, was used from March to April 2011. A self-administered questionnaire was distributed to a total of 180 employees in the organization. The data was cleaned, coded and fed to SPSS Version 16.0 and was analyzed using t-value and factor analysis.

The findings show that males understand and practice knowledge sharing better. And, employees between the ages of 25 and 34 and with an education level of bachelor's degree understand knowledge sharing in the organization better. The result also shows, IT infrastructures, personal benefits, management problems, attitude and willingness of individuals, skills and knowledge storage mechanisms are the critical factors that affect knowledge sharing in the organization.

The study concludes that, since knowledge sharing is very important for organizations to enhance their performance, top managers should give value to it and they have to link it with rewards, recognitions and some benefits that motivate the employees to share their knowledge.

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List of Acronyms

CoPs ……..Community of Practices,

ERP ……Enterprise Resource Planning

HR ……....Human Resource

ICT ……Information Communication Technology

IT ……...Information Technology

KM ……Knowledge Management

KMO …….Kaiser-Meyer-Olkin

KPIS ……..Key Performance Indicators

KS …….……Knowledge Sharing

MACROS……..Multi-Purpose Access for Customer Relations and Operational Support

MBA …….Master of Business Administration

MIE ……Mesfin Industrial Engineering

PLC ……Professional Learning Community

SECI……Socialization, Externalization, Combination and Internalization

TPB ……Theory of Planned Behavior

VLC ……Virtual Learning Community

CHAPTER ONE

INTRODUCTION

1.1 Background

The world is now in the era which has been termed the knowledge age. That means, knowledge is the primary commodity and most important in the economy (Nakkiran and David, 2003). According to Nakkiran and David (2003), knowledge is defined as human expertise which is found in peoples mind and gained through experience, interaction and the like. Every accomplishment needs some sort of knowledge, because there is nothing which can be performed without knowledge. Since knowledge is used as source of economy, knowledge management is popular and plays an important role in an organization to improve its performance and gain competitive advantage (Alam et al., 2009; Abdullah et al., 2005). Knowledge management is the process that governs the creation, dissemination and utilization of knowledge to fulfill organizational objectives. It also refers to a range of practices used by organizations to identify, create, represent, and distribute knowledge for reuse, awareness, and learning across the organizations (Adhikari, 2010). To manage, retain, reuse and share knowledge, proper knowledge management implementation plays a great role.

Knowledge is the key reason for both business and academic world (Chong, 2005). But having knowledge by itself is not worthy unless it is shared with friends, staff and the community at large. Knowledge sharing is a process where the individual exchanges his/her knowledge and ideas through discussions to create new knowledge or ideas (Alam et al., 2009). Organizations which implement knowledge sharing properly become successful and competent enough in this world. As a result, many organizations are encouraging the knowledge sharing behavior among their employees in order to meet the organization's objective and goals. However, the implementation of knowledge management in every organization in Ethiopia is very poor. For this reason, every organization should give value for the proper implementation of knowledge management, so as to meet organizations objectives and goals.

MIE is a big and complex organization that needs knowledge sharing behavior among its employees. Knowledge sharing enables shortening the learning cycle for new employee, retain experience from serving staff, help staff members to reflect on their experience and facilitates knowledge retrieval and reuse. Therefore, it is very important for the industry in general to bridge the Know Do gap, which is the problem of applying existing knowledge practically (Kwong and Lee, 2009). Knowledge sharing also prevents from reinventing the wheel which is costly and time taking.

Now a-days everybody believes that knowledge sharing plays a great role in every organization, but there are challenges that prevent knowledge sharing practices.

According to Ardichvili et al. (2006), competitiveness, job-security and power are some of the fears that arise in individual's mind if they share their knowledge to others. Individuals have the culture that: if someone solves problems that others cannot solve, he/she will be valued and get self-respect. Sometimes individuals know that sharing is good but they do not share because they think they get less than what they need contribute. This is a comparison of personal benefit and cost.

According to Aulawi et al. (2009), the paradigm that"knowledge is power, so if it is spread, it will cause somebody to lose his/her personal guarantee", is one factor that affects knowledge sharing among individuals. Limitation of time and low appreciation to the knowledge contributor are also another factor of knowledge sharing among individuals.

This research investigated knowledge sharing behaviors of employee's of MIE, by identifying the factors and challenges that affect knowledge sharing among individual employees.

1.2 Statement of the problem

The heart of any knowledge preservation strategy is its knowledge sharing practices. There are many sorts of methods that contribute to knowledge capture, sharing and re-application. These are: after-action reviews, communities of practice, face-to-face

meetings, mentoring programs, expert referral services, training, video conferencing, interviews, written reports, etc. are helpful for creating a general knowledge sharing environment (David, 2002). But in Ethiopia and other developing countries these are not used to the extent of desired change.

According to Atul and Jason (2002), sharing of significant knowledge is power and concluded to impact the formation of competitive advantage. The authors also investigate two mediating factors for ensuring proper dissemination of knowledge, such as communication facilitation and organizational culture development.

Today, organizations are dealing with the concept of sharing and some believe that sharing what you have is important, but most individuals especially in developing countries like Ethiopia do not agree with this idea, because there is fear of losing their power position, incentive and respect if they allow their knowledge to be used by others. The problem of knowledge sharing may also arise from the culture, infrastructure and management problems of organizations.

The organization under study is one of the organizations that need knowledge management implementation i.e. creating, sharing and utilization of knowledge, because knowledge world enable MIE to provide quality and timely services. Knowledge sharing is the most important part of knowledge management, but employees are not voluntary to share what is in their mind. Therefore, every time a new employee joins the organization, he/she may face difficulties to be familiar with the tasks that they are responsible for. Because there is no well documented knowledge of how activities are performed in the organization and also there is no well organized knowledge sharing culture and knowledge sharing mechanism to inform the new entrant. This also diminishes the performance of the organization. Of course there are some knowledge sharing practices, including training new staff, informal communications and documentation, but these activities are at the infant stage.

Kwong and Lee (2009) investigate how to elicit knowledge of the reliable engineers through narratives and cognitive mapping in industries. The authors also identify the challenges of knowledge elicitation in industry.
But knowledge sharing which is the backbone of knowledge management was not included in their study.

In Ethiopia, knowledge management implementation is almost a new concept to organizations. Researches on knowledge management area are conducted for some organizations, such as hospitals, but for MIE there is so far no research conducted on the knowledge management parts, such as creating, capturing, representing and sharing of knowledge.

The aim of this research is to identify knowledge sharing behaviors among employees of the MIE and model the mechanisms of knowledge sharing, so as to help the employees on acquiring knowledge easily and create a significant change in the organization's performance.

1.3 Research questions

The study attempts to answer the following questions:

- Does the organization supply the required resources to enhance knowledge sharing?
- How does the knowledge sharing behavior among employees in the MIE, look like and what are the cause and effect?
- Does organizational culture affect knowledge sharing practices?
- Is there any motivational scheme to encourage employees sharing their knowledge?
- To what extent is the knowledge sharing practice within the organization supported by information communication technology (ICT)?

1.4 Objective of the study

1.4.1 General objective

Currently, knowledge is the main source of economy. Therefore, managing this source of economy plays a great role on organizations performance. Hence, the main objective of this research is to identify and discuss the factors that affect knowledge sharing in MIE, with the aim of creating awareness for organizations to adapt knowledge sharing for competitive advantage and organizational success.

1.4.2 Specific objectives

To achieve the main goals, the study has the following specific objectives:

- To understand and determine the concept of knowledge sharing and its benefits by reviewing the literature.
- To identify existing knowledge sharing behavior among employees of the MIE.
- To model knowledge sharing mechanisms and practices among employees.
- To identify the factors that affect knowledge sharing in the organization.
- To provide recommendations and further research directions.

1.5 Significance of the study

Knowledge is the main and strategic resource of an organization; so, managing knowledge is crucial for success of organizations (Ipe, 2003). If an organization needs to sustain its existence, knowledge sharing culture should be integrated within its employees and other knowledgeable experts outside the organization.

The research helps to identify the process of knowledge sharing among employees at MIE which helps to easily understand knowledge sharing concepts and mechanisms. The study also identifies factors that affect knowledge sharing among employees of the organization.

Since the study will help to design better knowledge sharing models within the organization, employees will benefit in acquiring knowledge of how things are done in the organization. The organization also stays competitive or stays on continuous development, since its employees easily know how activities are performed without wasting time.

1.6 Scope and limitation of the study

Knowledge management is about knowledge creation, knowledge capturing, knowledge representation and knowledge sharing. However, the scope of the study is limited to knowledge sharing behaviors of employees of MIE in Mekelle. This will enable to identify knowledge sharing practices in the organization and, propose, among other things, appropriate models of knowledge sharing mechanisms to enhance knowledge sharing among employees. Within organizations there are organizational, team and individual knowledge. The study focuses on the individual knowledge sharing. That means, the study does not consider the organizational and team knowledge sharing behavior.

The result of the research would be more fruitful if it is conducted widely by including several organizations in Ethiopia. However, due to time, labor and money constraints the study is limited to treat the problems and factors of knowledge sharing among employees of MIE in Mekelle.

1.7 Organization of the study

This paper is organized into six chapters. The first chapter is about the background of the study, statement of the problem, objective of the study and scope and limitation of the study. The second chapter presents review of related literatures to knowledge sharing and discus related works in that area. The third chapter discusses the methodologies and procedures followed for the data collection, analysis and interpretations. The fourth chapter presents the study findings, and presentation of the results. The fifth chapter presents the possible models that are important for knowledge sharing among employees

of MIE and other related industries. The sixth chapter brings to an end of this survey research with summary, conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

With the rapid changes taking place in information technology and the Internet, business models must continue to meet the changing environment in order to survive. Only firms participating in knowledge management activities, such as the creation and utilization of knowledge, can hope to enjoy the rewards of business reform in today's knowledge-based economy (Kanagasabapathy et al, 2006). Knowledge management also plays a great role in an organization in producing outcomes such as sales revenue, market share, customer retention and environmental compliance (Firestone and Mark, 2005).

In general, knowledge management is important in managing organizational knowledge so as to create new knowledge from the existing knowledge. Creation of new knowledge also becomes easy when there is knowledge sharing among individuals, groups and communities of organizations. Therefore, the main lesson for knowledge management is to facilitate and to stimulate a broad portfolio of knowledge-sharing mechanisms among employees, communities and departments in any organization (Berends et al, 2006).

2.2 Knowledge

Knowledge is a very important resource for preserving valuable heritage, learning new things, solving problems, creating core competences, and initiating new situations for both individuals and organizations in this new business world now and in the future (Liao et al., 2004). Because of that, currently organizations are moving from capital intensive towards knowledge intensive, because knowledge is used both as strategic asset and the main source of organizational competitive predominance (Adenfelt and Lagerstrom, 2006).

Individuals as well as organizations who have adequate knowledge of how things are done will survive and stay competitive throughout the world.

Knowledge is defined as justified true belief. Individuals justify the truthfulness of their beliefs based on their interactions with the world (Nonaka 1994; Nonaka et al., 2006). In addition knowledge is the actuality of skillful action or the potentiality of defining a situation so as to permit (skillful) action (Stehr, 1994). Knowledge also allows humans to define, prepare, shape, and learn to solve a task or problem (von Krogh et al. 2000).

2.3 Principles of knowledge

According to Allee (1997), it is better to understand knowledge before managing it. The author stated that the new knowledge equation is:

> Knowledge = power, so share it and it will multiply. Widespread noncompetitive benchmarking and best-practice sharing show how eagerly individuals are embracing the concept of knowledge sharing.

He also mentions twelve guiding principles of knowledge as follows:

1. **Knowledge is messy:** because knowledge is connected to everything else, you can't isolate the knowledge aspect of anything neatly. In the knowledge universe, you can't pay attention to just one factor.
2. **Knowledge is self-organizing:** the self that knowledge organizes around is organizational or group identity and purpose.
3. **Knowledge seeks community:** knowledge wants to happen, just as life wants to happen. Both want to happen as community. Nothing illustrates this principle more than the Internet.
4. **Knowledge travels via language:** without a language to describe one's experience, everyone can't communicate what they know. Expanding organizational knowledge means that individuals must develop the languages they use to describe their work experience.
5. **The more you try to pin knowledge down, the more it slips away:** it's tempting to try to tie up knowledge as codified knowledge-documents, patents, libraries, databases, and so forth. But too much rigidity and formality regarding knowledge lead to the stultification of creativity.

6. **Looser is probably better:** highly adaptable systems look sloppy. The survival rate of diverse, decentralized systems is higher. That means there will be wastage of resources and energy in trying to control knowledge too tightly.
7. **There is no one solution:** knowledge is always changing. For the moment, the best approach to managing it is one that keeps things moving along while keeping options open.
8. **Knowledge doesn't grow forever:** eventually, some knowledge is lost or dies, just as things in nature. Unlearning and letting go of old ways of thinking, even retiring whole blocks of knowledge, contribute to the vitality and evolution of knowledge.
9. **No one is in charge:** knowledge is a social process. That means no one person can take responsibility for collective knowledge.
10. **You can't impose rules and systems:** if knowledge is truly self-organizing, the most important way to advance it is to remove the barriers to self-organization. In a supportive environment, knowledge will take care of itself.
11. **There is no silver bullet:** there is no single leverage point or best practice to advance knowledge. It must be supported at multiple levels and in a variety of ways.
12. **How you define knowledge determines how you manage it:** the knowledge question can present itself many ways. For example, concern about the ownership of knowledge leads to acquiring codified knowledge that is protected by copyrights and patents.

2.4 Types of knowledge

According to Day (2005), there is an idea of a dichotomy of knowledge that has been one of the guiding concepts in Knowledge Management (KM). That is tacit and explicit. This dichotomy has provided a theoretical base, but it has, arguably, acted as a limit to Knowledge Management's further theoretical and practical development. Furthermore, Herschel et al. (2001) describe that many practitioners and researchers in the knowledge management arena are aware that there are two forms of knowledge: explicit knowledge and tacit (implicit) knowledge.

In general, there are two categories or types of knowledge which can be described as two basic knowledge management approaches.

2.4.1 Tacit knowledge

According to Nonaka and Krogh (2009), the concept of tacit knowledge is a cornerstone for any organization and covers knowledge that is unarticulated and tied to the senses, movement skills, physical experiences, intuition, or implicit rules of thumb. He also provides examples of tacit knowledge such as knowledge of wine tasting, crafting a violin, and interpreting a complex seismic printout of an oil reservoir. Tacit knowledge differs from explicit knowledge that is expressed and captured in drawings and writing. The authors also state the Dictionary definition of tacit knowledge as "knowledge for which individuals do not have words".

Tacit knowledge is a know-how and learning embedded within the minds of the people in an organization (Kidwell et al., 2000). It involves perceptions, insights, experiences, and craftsmanship. The authors also described its characteristics as being:

- Personal
- Context-specific
- Difficult to formalize
- Difficult to communicate
- More difficult to transfer

According to Polanyi (1967), tacit knowledge is knowing more than everyone can tell, or knowing how to do something without thinking about it, like riding a bicycle. Tacit knowledge is practical, action-oriented knowledge or ''know-how'' based on practice, acquired by personal experience, seldom expressed openly, often resembles intuition. He also described it as a local knowledge and one cannot found it in manuals, books, databases or files. Tacit knowledge is technical or cognitive and is made up of mental models, values, beliefs, perceptions, insights and assumptions. Technical tacit knowledge is demonstrated when people master a specific body of knowledge or use skills like those gradually developed by master craftsmen (Smith, 2001).

Tacit and explicit knowledge are the two fundamental approaches of knowledge management (Sanchez, 2000). The tacit knowledge approach emphasizes understanding the kinds of knowledge that individual in an organization have, moving people to transfer knowledge within an organization, and managing key individuals as knowledge creators and carriers. In general the tacit knowledge is the knowledge that individuals have in their mind. This knowledge is more important for organizations and it provides long lasting competitive advantage. But it is hard to communicate and share it to others. Even if somebody knows very well how something is done he/she may face difficulties of telling it, then w prefer to show it.

2.4.2 Explicit knowledge

Explicit knowledge is academic knowledge or know-what that is described in formal language, print or electronic media, often based on established work processes, use people-to-documents approach. Most explicit knowledge is technical or academic data or information that is described in formal language, like manuals, mathematical expressions, copyright and patents. This systematic knowledge is readily communicated and shared through print, electronic methods and other formal means (Smith, 2001).

According to Kidwell et al. (2000), explicit knowledge is documented information that can facilitate action. It can be expressed in formal, shared language. Examples include formulas, equations, rules, and best practices. The authors also described the characteristics of explicit knowledge as follows. Explicit knowledge is:

- Packaged
- Easily codified
- Communicable
- Transferable

Explicit knowledge is one approach of knowledge management and it emphasizes processes for articulating knowledge held by individuals, the design of organizational approaches for creating new knowledge, and the development of systems (including

information systems) to disseminate articulated knowledge within an organization (Sanchez 2000).

According to Choo (1996), explicit knowledge is formal knowledge that is straightforward to transmit between individuals and groups. It is frequently articulated in the form of mathematical formulas, rules, specifications, and so on. The author also explains that explicit knowledge does not appear spontaneously, but must be nurtured and cultivated from the seeds of tacit knowledge.

Therefore, explicit knowledge is tacit knowledge which is codified, documented and stored in manuals, databases and others in order to be shared, communicated and transferred among individuals, groups and communities as a whole. Explicit knowledge makes life easy in this world because if there is documented materials of how things done there may not be challenges of knowing how things done for everyone.

2.5 Knowledge conversions

Knowledge conversion is the process that, describes theoretically and empirically, the interaction between tacit and explicit knowledge. At the heart of Nonaka and Takeuchi (1995) work is the premise that there are two types of knowledge: tacit and explicit. Tacit knowledge is subjective and experience based knowledge that cannot be expressed in words, sentences, numbers or formulas, often because it is context specific. This also includes cognitive skills such as beliefs, images, intuition and mental models as well as technical skills such as craft and know-how.

Explicit knowledge is objective and rational knowledge that can be expressed in words, sentences, numbers or formulas (context free). It includes theoretical approaches, problem solving, manuals and databases.

Therefore, the knowledge conversion process is based on these two premises of tacit and explicit knowledge and the process clearly shows interaction between them.

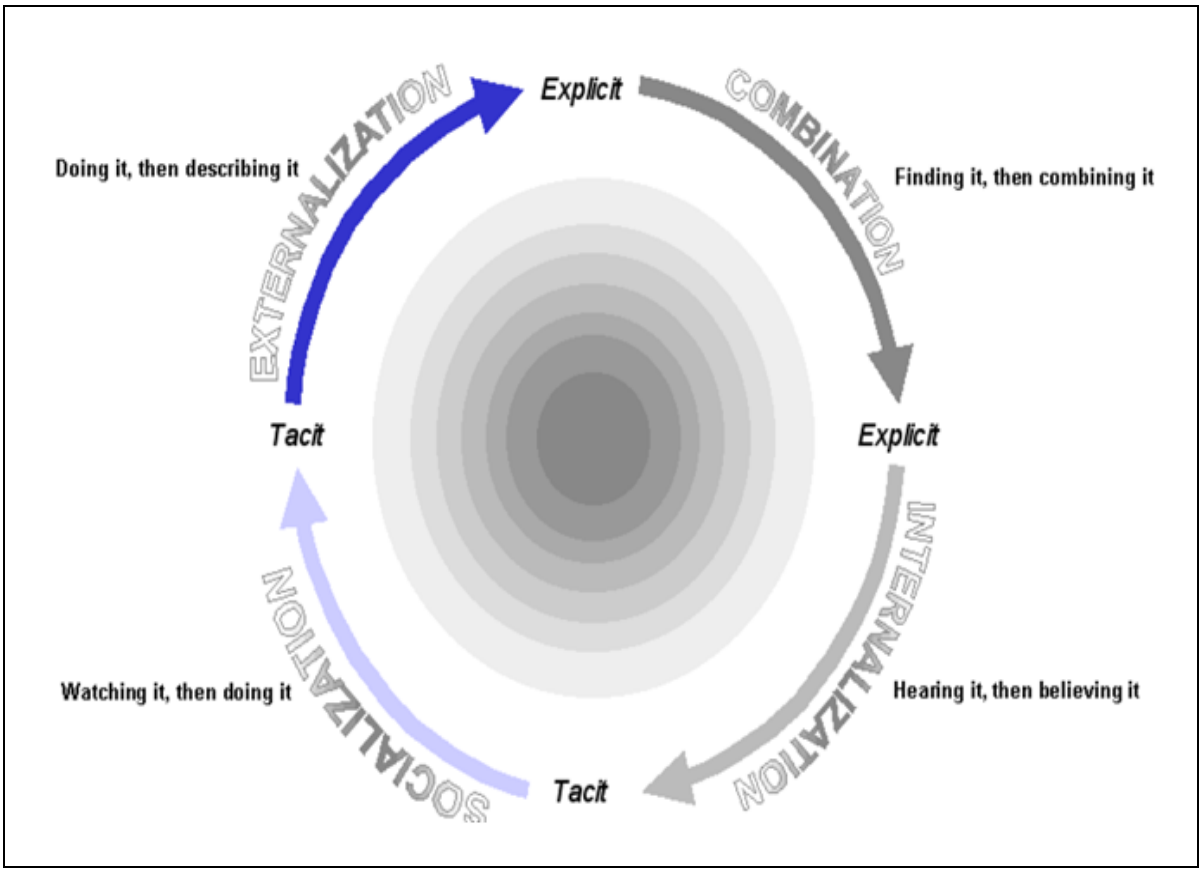

Figure 2. 1: Knowledge conversions (Nonaka and Takeuchi, 1995)

The authors analyze knowledge conversion in four zones, a two by two matrix of knowledge moving from tacit or explicit to tacit or explicit. Each quadrant requires a different kind of thinking and interaction.

Combination: Explicit to Explicit

In this process there is explicit knowledge, and this explainable knowledge will combine with other explicit knowledge, and then develop new explicit knowledge. Information technology is most helpful, because explicit knowledge can be conveyed in documents, email, databases, as well as through meetings and briefings. The key steps collecting relevant internal and external knowledge, dissemination, and editing or processing to

make it more usable. Combination allows knowledge transfer among groups across organizations (Nonaka and Takeuchi, 1995**)**.

Explicit to explicit is the process of corporation of various bodies of existing explicit knowledge that leads to the creation of new explicit knowledge (Alkhaldi, 2003).

Internalization: Explicit to Tacit

There is explicit knowledge, people in general will understand and absorb this explicit knowledge into tacit knowledge held by the individual or it is the process of embodying explicit knowledge into tacit knowledge. Knowledge in the tacit form is actionable by the owner. Internalization is largely experiential, in order to actualize concepts and methods, either through the actual doing or through simulations, action learning and on the job experiences. The internalization process transfers organization and group explicit knowledge to the individual. Information sharing provides the ground for internalizing explicit knowledge into tacit actions. It is closely related to learning by doing. It is rather important to indicate that the conversion does not occur within individuals but between individuals within an organization (Nonaka and Takeuchi, 1995**)**. The authors also described that internalization relies on two dimensions. (1) Explicit knowledge must be put into action and practiced. (2) The process of taking the explicit knowledge and putting it into action.

Socialization: Tacit to Tacit

This is the process that transfers tacit knowledge in one person to tacit knowledge in another person. It is experiential, active and a living thing, involving capturing knowledge by walking around and through direct interaction with customers and suppliers outside the organization and people inside the organization. This depends on having shared experience, and results in acquired skills and common mental models. Socialization is primarily a process between individuals or a focus group (Nonaka and Takeuchi, 1995; Stevens et al., 2010**)**.

Externalization: Tacit to Explicit

Externalization occurs when tacit knowledge is made explicit in the form of metaphors, analogies, hypotheses and models. It is the attempt to conceptualize individuals' image, and then express it in language, where at this mode of knowledge conversion, information is mainly used to compile different analogies and metaphors for the creation of new knowledge. There are three ways of externalize the tacit knowledge. One is the articulation of one's own tacit knowledge such as ideas or images in words, metaphors, analogies. The second case is eliciting and translating the tacit knowledge of others such as customer, experts for example into a readily understandable form, e.g., explicit knowledge. The third is dialogue which is an important means for both. During such face-to-face communication people share beliefs and learn how to better articulate their thinking, though instantaneous feedback and the simultaneous exchange of ideas. Externalization is a process among individuals within a group (Nonaka and Takeuchi, 1995**)**.

According to Polanyi (1958), language is key factor to identify tacit and explicit knowledge.

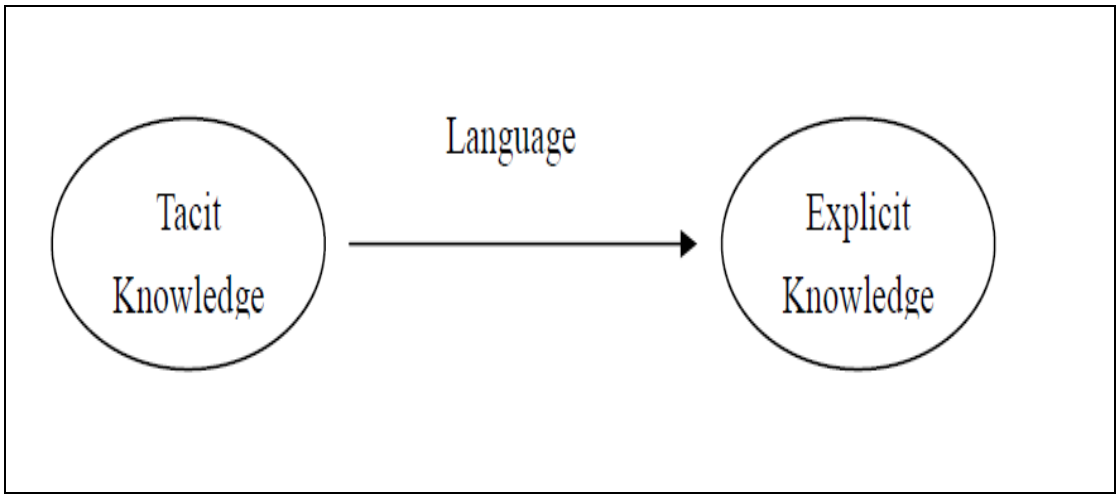

Figure 2. 2 Conversion of tacit to explicit (Polanyi, 1958)

Although Polanyi (1958) proposed language can make tacit knowledge to explicit, however, he noticed the constraints of the operational principles of language are

linguistic representation process and operation of symbols. The reason is that language cannot fully represent the meaning. Therefore, even if everyone uses language to codify something, the meaning of it is still not perfectly clear. Limitation of a language takes a big part of tacit knowledge.

Table2. 1 Summary of SECI (Nonaka and Takeuchi, 1995)

	Process	Knowledge sharing
1.	Tacit to tacit (Socialization)	Knowledge is shared during social interaction such as story telling that enable transfer of complex tacit knowledge from an technological to another.
2.	Tacit to explicit (Externalization)	Knowledge sharing happens when an individual try to communicate his/her tacit knowledge with others through for example writing ideas and thoughts in the form of theory.
3.	Explicit to explicit (Combination)	When knowledge is written in the form of documents, it is shared with other people. If they combine their knowledge, it will create new ideas that written on papers.
4.	Explicit to tacit (Internalization)	Human can get knowledge when rational behind a document is informed by other individuals.

2.6 Knowledge management

Knowledge management is a broad concept that it is about creation, dissemination, representation and utilization of knowledge. But there is no single definition, which means different scholars define it differently as follows.

Knowledge management is the set of processes that seeks to change the organization's present pattern of knowledge processing to enhance both the organization and its outcomes (Firestone and Mark, 2005). According to Barquin (2001), knowledge management is the process through which an enterprise uses its collective intelligence to accomplish its strategic objectives.

KM is managing the corporation's knowledge through a systematically and organizationally specified process for acquiring, organizing, sustaining, applying, sharing, communicating and renewing both the tacit and explicit knowledge of employees

to enhance organizational performance and create value (Allee, 1997; Alavi and Leidner, 2001).

A study related to KM was conducted by Alavi and Leidner (1999), to ascertain the meaning that managers ascribe to the concept of knowledge management and three perspectives emerged: an information-based perspective, a technology-based perspective, and a culture-based perspective.

Information-based perspective: managers describe knowledge management as it is about characteristics of information, such as readily-accessible information, real-time information, and actionable information. Its focus is concerned with reducing the overload of information by filtering the gems from the rocks.

Technology-based perspective: managers associate knowledge management with various other systems such as data warehousing, enterprise wide systems, executive information systems, expert systems, and the intranet, as well as various tools (e.g., search engines, multi-media, and decision making tools).

Culture-based perspective: managers associate knowledge management with learning (primarily from an organizational perspective), communication, and intellectual property cultivation. And they suggested that the information technology component of knowledge management was only 20% of the concept whereas the cultural and managerial aspects accounted for the bulk of the issue.

The effectiveness of knowledge management is determined by the knowledge infrastructure such as technology, structure and culture along with knowledge process architecture that are acquisition, conversion, application and protection (Gold et al.,2001).

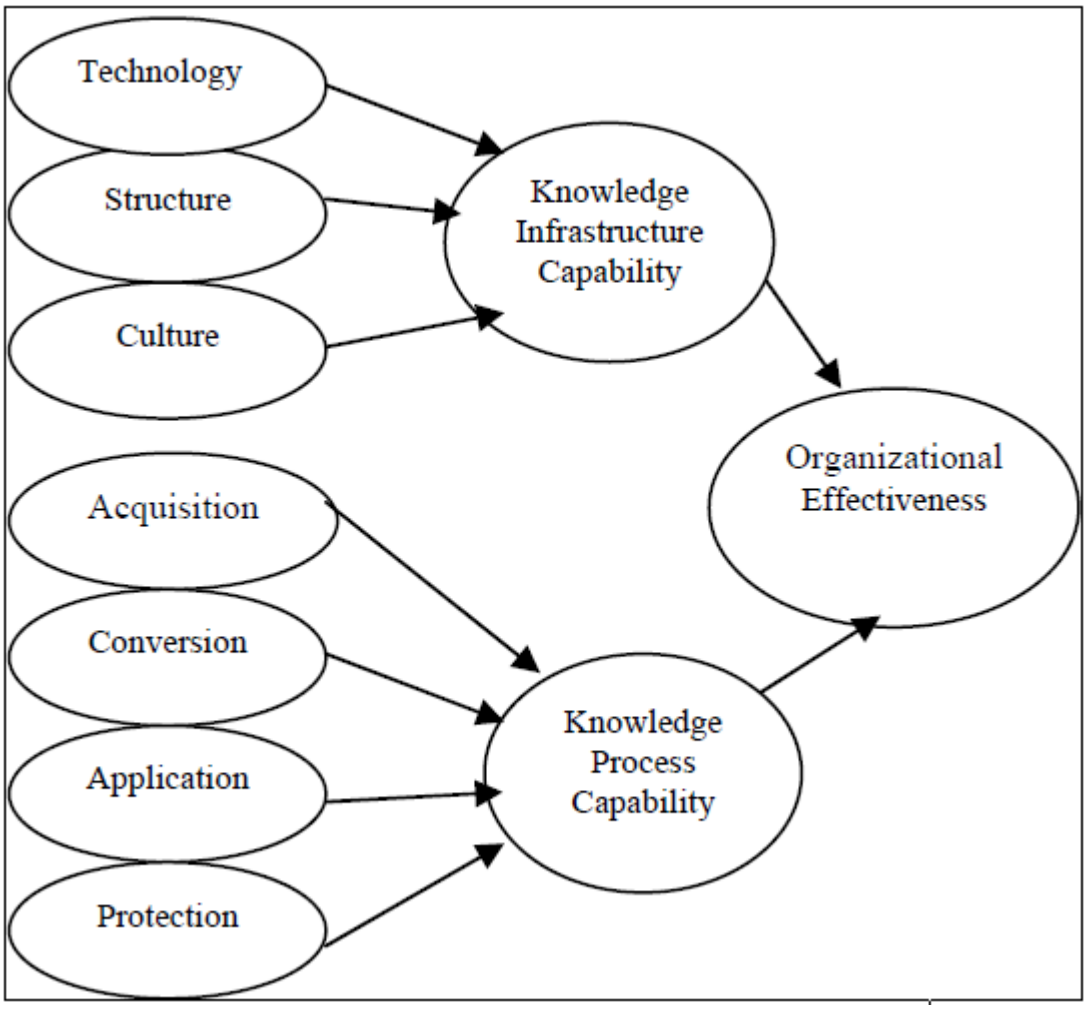

Figure 2. 3 Knowledge management capabilities (Gold et al., 2001)

Figure 2.3 shows that knowledge management implementation will be effective if organizations have the knowledge infrastructure; technology refers the technology-enabled infrastructures that exist within the firm, structure refers to the presence of norms and trust mechanisms and culture which is the sharing context of the firm. And the other knowledge management capability is the presence of proper knowledge process architecture (acquisition, conversion, application and protection).

2.7 Knowledge sharing

Knowledge exists in the minds of employees, which cannot be clearly observed, then how to manage this knowledge has become a particularly difficult problem in knowledge

management. Knowledge in the mind of individuals or tacit knowledge is essentially an unconscious cognitive ability, and it is highly personalized knowledge that is acquired by individual experience. Therefore, it is through sharing that enterprises manage this knowledge well, and promote its sharing among staff to enhance competitive advantages.

The old paradigm, which is, knowledge is power is changed, and it needs to be explicitly understood that sharing knowledge is power (Gurteen, 1999). Performing activities in an organization requires a collaborative effort. If you try to work alone you are likely to fail, you need not only the input from other people but also their support. Therefore, being open with them, and sharing with them helps you achieve your objectives. According to Al-Hawamdeh (2003), knowledge sharing is the communication of all types of knowledge including explicit knowledge (information, know-how) and tacit knowledge (skills and competency).

Knowledge sharing can be defined as a social interaction culture, involving the exchange of employee knowledge, experiences, and skills through the whole department or organization (Hogel et al., 2003). The authors also explained that knowledge sharing occurs at the individual and organizational levels. For individual employees, knowledge sharing is talking to colleagues to help them get something done better, more quickly, or more efficiently. For an organization, knowledge sharing is capturing, organizing, reusing, and transferring experience-based knowledge that resides within the organization and making that knowledge available to others in the business.

Knowledge sharing is, the process that, intended to exploit existing knowledge. To enhance the reusability of knowledge, first the knowledge sharing process identify existing and accessible knowledge, in order to transfer and apply this knowledge to solve specific tasks better, faster and cheaper than they would. They also described that KS is more than the closing of performance gaps and the sharing of stocks of knowledge. It is also about bridging situations of organizational interdependencies and thereby supporting ongoing organizational activities. The goal of knowledge sharing can either be to create new knowledge by differently combining existing knowledge or to become better at exploiting existing knowledge (Christensen, 2007).

According to Riesenberger (1998), knowledge sharing is very important in organizations success since it enables: to learn about customers, to seek best practices, to recognize internal competencies and products, to discover emerging market trends, and to find competitive intelligence.

2.7.1 Knowledge sharing within an organization

There is an increasing emphasis on the importance of knowledge sharing (KS) for organizational performance and effectiveness in organizations (Kim and Lee, 2005). As knowledge is a central resource of government service, effective knowledge sharing among employees is a significant public management challenge for providing excellent government services to constituencies at all levels. Kim and Lee state that knowledge sharing is very important for organizations competitive advantage. The authors conducted a research on South Korea both for public and private companies. Their objective was to analyze the influences of organizational culture, structure, and IT on employee knowledge sharing capabilities in five public and five private sector organizations. Their results suggest that organizational culture, structure, and information technology all exert significant influences on the KS capabilities of the employees of five South Korean government ministries. In addition, public employees scored lower than their private-sector counterparts on KS skills. The findings imply a need for greater effort and commitment on the part of public sector leaders and managers to building KS capabilities via the establishment of stronger informal and formal networks, reward systems for KS activities, improved IT infrastructures, and increased end-user support.

Knowledge sharing creates opportunities to maximize organization ability to meet their goals and objectives and also enables them to stay competitive throughout the world (Lin, 2007). In Lin's study the main objective was to examines the influence of individual factors: enjoyment in helping others and knowledge self-efficacy; organizational factors: top management support and organizational rewards and technology factors: information and communication technology use on knowledge sharing processes and whether leads to superior firm innovation capability. Their findings indicate that both enjoyment in helping others and knowledge self-efficacy were strongly associated with employee

willingness to share knowledge. This result implies that employees who feel pleasure in sharing knowledge and thus helping others tend to be more motivated to donate and collect knowledge with colleagues. Additionally, a sense of the competence and confidence of employees may be requirement for employees to engage in knowledge sharing. That is, employees who believe in their ability to share organizationally useful knowledge tend to have stronger motivation to share knowledge with their colleagues. Related to organizational factors, top management support was effective for employee willingness to both donate and collect knowledge with colleagues, but organizational rewards was not. As a result the author advice that management should recognize that organizational rewards only secure temporary compliance. To promote knowledge sharing activities, top management facilitation of social interaction culture is more important than extrinsically motivated employees (such as those motivated by monetary compensation).

Performance of organization is measured by the brainpower or intellectual capital that it has. And the performance can be enhanced when people communicate or share the brainpower such as information, effective practices, insights, experiences, tastes, lessons learned, as well as common and uncommon sense (Liao et al., 2004). The authors conducted a research for Taiwanese finance and securities firm in order to investigate the issue of employee relationship within the organization, together with the attitudes and intentions toward knowledge sharing with their colleagues. The researchers test their study using the following hypotheses:

- ☞ The relationship between employees and the firm is good; employees would like to share working knowledge and experience with colleagues voluntarily.
- ☞ The relationship between employees and the firm is good; employees would like to share working knowledge and experience with colleagues unconditionally.
- ☞ The relationship between employees and the firm is not good; employees would like to share working knowledge and experience with colleagues conditionally.
- ☞ The relationship between employees and the firm is not good; employees would not like to share working knowledge and experience with colleagues.

Their findings are the relationship between some employees and the firm is good, and those employees would like to share working knowledge and experience with colleagues voluntarily and unconditionally. On the other hand, the relationship between some employees and the firm is not probably good, and those employees are reluctant to share working knowledge and experience with colleagues or under some conditional terms. Finally, they conclude that the success of knowledge sharing in organizations, depend not only technological means, but is also related to behavioral factors. They also determine that, most important task to organizations' knowledge management should be to manage employee relationships.

The study conducted by Ölçer (2007) investigates KM practices and their impacts on effectiveness and performance of the employees and the organizations in large scale manufacturing companies in Turkey. The author assessed the knowledge sharing culture, knowledge source, impact of KM and Benefit of KM in the organization and what KM system which they use to capture, process, create, measure, and transfer their knowledge. The findings show that 92% agree that their organizations facilitate knowledge sharing and dialogue within the organization. Furthermore, 78% agree that employees take responsibility for their own learning and that dialogue and discussion are encouraged throughout the organization. The results relating to how knowledge is shared or disseminated across the organization are present in the table below.

Table 2. 2 Methods to assist knowledge sharing (Ölçer, 2007)

Options	%	Options	%
Internet	93	Multimedia presentations	75
Electronic mail	90	Workshops/forums/seminar	73
Face-to-face meetings for dialogue sharing	82	Creativity techniques	72
Mentoring and coaching	79	Discussion forums	67
Databases	77	Intranet	54
Cross-functional learning	76	Groupware	53
Training needs analysis	75		

As seen from the table above, the most important method used by the Turkish companies to facilitate sharing of knowledge between employees is internet and electronic mail. The most important benefits of KM are, it delivers strong benefits by the way of improved quality and employee productivity. On the other hand, the most important impact of KM system was improving quality and increasing employee productivity, followed by efficiency, then employee creativity. Results related to source of knowledge shows that the majority companies use customer knowledge (90%) and others mistakes (88%) as a source for their knowledge system. Therefore, the customer is considered as the king and his feedback is valued the most. In addition, 85 and 83 percent of the companies, respectively, use their employees' performance and employees' knowledge, while 84 percent use organizational knowledge as a source for their knowledge system.

2.7.2 Knowledge sharing mechanisms among employees

Knowledge sharing mechanisms are the means by which individuals access knowledge and information from others. Knowledge sharing mechanisms are also defined as the formal and informal mechanisms for sharing, integrating, interpreting and applying know-what, know-how, and know-why embedded in individuals and groups that will aid in the performance of organizational tasks (Boh, 2007).

According to Boh (2007), personalization versus codification and individualization versus institutionalization are two distinct dimensions of knowledge sharing mechanisms. Personalization mechanisms are often assumed to be more ad hoc and informal. If knowledge is shared through a personalization mechanism, it will be closely tied to the person who developed it and shared through direct person-to-person contacts.

Codification mechanisms are assumed to be formal and involve the use of electronic databases. If knowledge is shared through a codification mechanism, knowledge is carefully codified and stored in databases and documents, where it can be accessed and used easily by employees in the company (Boh, 2007). Codification is good mechanism to store large amounts of knowledge and to create an organizational memory for all employees (Goodman and Darr, 1998).

The other dimension of knowledge sharing mechanism is individualized versus institutionalized knowledge sharing mechanisms. Individualized knowledge sharing mechanism facilitate knowledge sharing at the individual level, and tend to be informal and unstructured, while institutionalized knowledge sharing mechanisms facilitate collective knowledge sharing, and tend to be formal and embedded in organizational routines and structure (Boh, 2007).

The researchers Bartol and Srivastava (2002) identified four mechanisms for the sharing of individual knowledge within organizations.

The first mechanism is contributing knowledge to the organizational databases; in this case every employee contributes their ideas, information and expertise to the organizations database.

The second is sharing knowledge in formal interactions within or across teams or work units or across employees working in different teams, departments and divisions. Meeting is one example of sharing knowledge through in formal interactions.

The third mechanism of sharing knowledge is sharing through informal interactions. In this case employees share their knowledge to each other through water cooler chat, telephone and the like. The authors described that the characteristic of informal interaction is that communication is not recorded and the contributions are more difficult to evaluate.

The final mechanism of knowledge sharing is, establishing community of practices (CoPs) (i.e., voluntary forums created around a particular topic of interest). CoPs enable employees within the organization to communicate in topics of interest. It is informal structure and can be extended beyond organizational boundaries. Using CoPs participants can ask questions, give responses to the questions posted by others, and initiate discussions on topics that might interest the virtual community.

2.7.3 Knowledge sharing success

The objective of any knowledge sharing is to transfer source knowledge successfully from a sender or owner of the knowledge to a recipient (Cummings and Teng, 2003). The authors identify the conditions that when knowledge is shared successfully:

- Knowledge sharing / transfer are successful if the knowledge is transferred on time, on budget, and produces a satisfied recipient.
- The degree to which the knowledge is re-created in the recipients; successful knowledge sharing results in firms mastering and getting into practice product designs, manufacturing processes, and organizational designs that are new to them.
- The degree to which a recipient obtains ownership of, commitment to, and satisfaction with the transferred knowledge.

2.7.4 Factors affecting knowledge sharing

Now a-days organizations are striving towards managing their knowledge so as to enable it to be shared from within the organization (Ismail and Yusof, 2010). This is due to the fact that knowledge is now regarded as an asset capable of giving many benefits that make a difference between successful and less successful organization. Sharing the knowledge that have enormous benefits improves the quality of service delivery of organizations and these organization are more service oriented rather than producing goods as their products.

Knowledge sharing has been identified as a major focus area for knowledge management. It provides a link between the level of the individual knowledge workers, where knowledge resides, and the level of the organization, where knowledge attains its economic and competitive value. If it is effectively practiced, knowledge sharing proves to be a significant barrier for effective knowledge management (Hendriks, 1999).

Because of the above and other unmentioned advantages of knowledge sharing, it is important to implement it effectively and apply in practice in the real world

organizations. One important issue that organizations to focus in order to implement the knowledge sharing task effectively and efficiently is to identify the factors that affect and foster knowledge sharing among individuals, departments, teams, groups, communities and organizations. As stated in may research papers factors that affect or foster knowledge sharing arises from three different factors. These are individual factor, organizational factor and technology factor.

Study related to individual factors has conducted by (Ismail and Yusof, 2010). Their aim was to investigate the relationship between individual factors such as awareness, trust and personality and the quality of knowledge sharing in Malaysian public agencies. Their findings show that awareness, trust and personality are correlated significantly with knowledge sharing quality. Personality is the most significant predictor on the quality of knowledge sharing, followed by trust and awareness. Creating awareness, trust and building the appropriate personality suitable for the endeavor amongst its staff, the entire public servants is the most important to successfully share knowledge of the individuals with others.

According to Kwakye and Nor (2011), individuals are the key in knowledge sharing success because individuals serve as knowledge generator and knowledge receptor. And then researchers have to focus on studying the willingness of individuals on sharing what they have in their mind. The authors described that the behavior people show in different situations depends highly on their personal intentions as well as the social forces, the degree of the reluctance or willingness towards sharing their knowledge might also same to this behavior. The aim of the research was to identify the relationship between knowledge sharing and four of the individual factors namely altruism, self efficacy, mutual reciprocity and trust.

Altruism can be referred to as a behavior that costs an individual and benefit the other person. People donate something to other people without thinking of any returns when showing altruistic behavior. The authors find that individuals with higher altruism may easily share their knowledge than individual with low altruism. Lin (2007) found that,

females have high altruism than males and so they tend to share knowledge more than men.

Self efficacy is the willingness of a person to perform certain activities. The authors also believe that individuals with a higher self efficacy may share their knowledge and past experience more willingly than individuals with low self efficacy because individuals with higher self efficacy would formulate a positive judgment on their capabilities which would motivate them to share their knowledge.

Mutual reciprocity is about cost and benefit. In the context of knowledge sharing, the donor of the knowledge will decide whether the recipient possesses potential of giving back a positive outcome. In this case the authors explained that people tend to weigh others' capabilities before they exhibit certain behavior. They intend not to lose in any endeavor so they will not share their knowledge to someone who has nothing to offer.

The authors described that trust is the focal point of every relationship within an organization. And they feel that, people will be motivated to share their knowledge when they perceive the recipients to be honest, trustworthy, and reliable. Higher trust will make individuals not think of any future negative occurrence on the activities and will share their knowledge.

In addition, Riege (2005) conducted a research on potential individual factors that hinder people from sharing knowledge. He found seventeen individual factors and these are:

lack of time to share knowledge; fear that sharing may jeopardize job security; lack of awareness; dominance in sharing explicit over tacit knowledge; apply of strong hierarchy, position-based status, and formal power; inadequate capture, evaluation, feedback, communication, and tolerance of past mistakes that would improve individual and organizational learning effects; differences in levels of experience; lack of interaction; poor verbal/written communication and interpersonal skills; difference of age; difference of gender; lack of social network; differences of education levels; taking ownership of intellectual property because of fear of not receiving recognition and accreditation from managers and colleagues; lack of trust in people because they misuse knowledge or take

unjust credit for it; lack of trust in the accuracy and credibility of knowledge due to the source and differences in national culture or ethnic background and values and beliefs associated with it.

Factors of knowledge sharing also arise from the organization itself. Study conducted by Zhang et al. (2006) investigates the dynamics of a knowledge sharing effort in New York State government that involved multiple organizations, divisions, and geographically separated offices in the development of the Multi-Purpose Access for Customer Relations and Operational Support System (MACROS). The authors on their research determined how organizational factors such as leadership, alignment of issues and incentives and coordination of a number and variety of groups affect knowledge sharing. The authors found that effective leaders are able to promote knowledge sharing through their ability to shape the organizational structures and processes, mobilize the resources, legitimate the changes, and cultivate norms and values in favor of sharing. Alignment of issues and incentives also plays a great role in knowledge sharing since it refers to the motivations and concerns that individuals have about knowledge sharing in a particular context. The incentive problem is fundamental for the success of knowledge sharing because humans are not likely to be willing to share the relevant knowledge and skills with other unless they gain benefits from the organization. The number and variety of groups greatly influences the effectiveness of knowledge sharing because the involvement of diverse groups, that means the growing size and heterogeneity of individuals who share their knowledge could have complicated the processes of communication, consensus building, and resources sharing, and thus created problems unless the coordination is strong.

In addition, De Long and Fahey (2000) described that organizational culture is a major barrier to leveraging intellectual assets. The authors focus on four ways in which culture influences organizational behaviors central to knowledge creation, sharing, and use. The first is the shared assumptions about what knowledge is and which knowledge is worth managing. Second is the relationship between individual and organizational knowledge. Third is the context for social interaction that determines how knowledge will be used in particular situations. Fourth is the process by which knowledge is created, legitimated, and distributed in organizations.

For their study, De Long and Fahey investigated how 24 organizations initiated and managed knowledge-related projects, and interviewed 12 chief knowledge officers across a range of manufacturing and service organizations. De Long and Fahey set out to demonstrate the importance of culture on many of the issues central to effective knowledge management and to explore the four ways in which organizational culture shapes knowledge creation, sharing, and use. The authors propose diagnostic action steps that managers can take to assess the fit between their organization's existing culture and desired behaviors related to effective knowledge management.

Furthermore, Sharrat and Usoro (2003) found that KS is influenced by the organizational structure (centralized and decentralized), technical infrastructure, trust, motivation and sense of community. Flexible organizations usually are better prepared to implement KS strategies as compared to more bureaucratic organizational structures.

Technology is also one of the factors that affect knowledge sharing even its effect is less as compared to the individual and organizational factors. Technology lead users to the information they need. This includes creating, gathering, storing, accessing and making available the right information that will result in the developments of insight for the organization's users (Davenport and Prusak, 1998). The authors also support the view that:

> Everybody expects technology to be a silver bullet—it isn't. You cannot ignore technology, but we must remember it is only an enabler. The real value is in linking people together, not in the technology itself.

According to Chen et al. (2009), organizations and educational institutions have implemented virtual learning communities to encourage knowledge sharing. However, VLC cannot be accomplished simply by grouping people together and telling them sharing your knowledge will make you learn better. As a result the authors attempt to examine the factors influencing knowledge sharing from the perspective of human behavior. Theory of Planned Behavior (TPB) is integrated with social network ties and empirical findings from virtual learning community literature to develop their research model. The model comprises eight hypotheses to explore questions of whether social

network ties, learners' attitude toward knowledge sharing, learners' beliefs of their capabilities in performing online knowledge sharing, and subjective norms relate to knowledge sharing intention, which leads to actual behavior in a virtual learning environment. They tested their hypotheses using a field survey of college students and MBA students enrolling courses conducted in a virtual learning community. Their findings show that; attitude, subjective norm, web-specific self-efficacy and social network ties are shown to be good predictors of knowledge sharing intention which, in turn, is significantly associated with knowledge sharing behavior. Knowledge creation self-efficacy does not significantly impact knowledge sharing intention.

The success of knowledge sharing depends on many factors as mentioned above from different literatures. This research aims to contribute to the general understanding of the factors determining the success of knowledge sharing in organizations as a whole and particularly to the organization under study. Based on reviewed literatures the author categorizes the critical knowledge sharing factors into five groups. These are leadership, social structure, culture, structure and information technology (IT) infrastructures.

2.7.4.1 Leadership

Leadership plays a key role in ensuring success in almost any initiative within an organization. Because effective leaders are able to promote knowledge sharing through their ability to shape the organizational structures and processes, mobilize the resources, legitimate the changes, and cultivate norms and values in favor of sharing (De Long and Fahey, 2000). Also Bollinger and Smith (2001) pointed out that the main responsibilities of leader is establishing a culture that respects knowledge, reinforces its sharing, retains its people, and builds loyalty to the organization. Therefore, leadership makes greater impact on knowledge sharing because leaders model the behavior they are trying to promote among employees.

There are two types of leadership behaviors transformational and transactional (Bass and Avolio, 1994). Transformational leadership is defined in terms of the leader's effect on followers. According to Bass (1998), there are four components of transformational leadership, which are:

- Idealized influence (attributes and behavior)
- Inspirational motivation
- Intellectual stimulation, and
- Individualized consideration.

Idealized influence refers to ways the leaders provide vision and sense of mission, instill pride, and behave as role models for their followers.

Inspirational motivation refers to how the leaders are able to have followers involved in envisioning attractive futures with the company. Leaders create clearly communicated expectations that followers want to meet and demonstrate commitment to goals and shared vision.

Intellectual stimulation refers to how the leaders arouse in subordinates an awareness of problems, recognition of their own beliefs and values, and an awareness of their own thoughts and imagination to promote intelligence, rationality, and careful problem solving.

Individualized consideration refers to how leaders give personal attention, treat each employee individually, and coach and advise each employee.

In addition, Bass (1998) summarizes several different types of behavior inherent in transactional leadership:

- Contingent reward
- Management by exception (active and passive), and
- Laissez-faire

Contingent reward refers to ways the leader assigns or obtains agreement on what needs to be done by promising rewards or actually rewarding others in exchange for satisfactorily carrying out the assignment.

Management by exception (active) refers to how leaders watch and search for deviations from rules and standards. Management by exception (passive) behavior involves intervening only if standards are not met.

The final one is laissez-faire that refers to leaders avoiding decision-making and abdicating responsibilities.

Furthermore, Bass and Avolio (1994) describe that transactional leadership emphasizes the transaction or exchange that takes place among leaders, colleagues, and followers. This exchange is based on the leader discussing with others what is required and specifying the conditions and rewards these others will receive if they fulfill those requirements.

Therefore, organizations in general and MIE in particular have to have clear understanding on how leadership behavior has an impact on effective knowledge sharing within an organization. It is better for the organization to know that leaders who communicate a strong vision and positive future and those who have clear expectations and create an awareness of organizational problems are likely to improve knowledge sharing. In addition, leaders who promote careful problem solving and provide personal attention to employees will also be more likely to improve knowledge sharing.

2.7.4.2 Organizational culture

To improve the effectiveness of knowledge sharing process, a better understanding of the role of culture in knowledge sharing is crucial. Organizational culture is the shared value and beliefs and shapes the practice of organizational members in the organizations (Xiong and Deng, 2008). Culture effectively influences the knowledge sharing process in an organization through: the development of a knowledge friendly organizational culture (Jones et al. 2006; Meso and Smith 2000), adequate consideration of the various kinds of culture involved (Ford and Chan 2003), and the application of effective technologies for facilitating the knowledge sharing process.

There are a lot of factors that affect the practice of knowledge management especially related to that of organizational culture. These are: having a culture that values knowledge seeking and problem solving; high level of trust among employees; sharing of mistakes openly by employees important without the fear of punishment; the collaboration among employees; encouragement of teamwork among employees; empowerment of employees to explore new possibilities; encouragement of individuals to ask and acceptance of knowledge sharing (not hoarding) as strength have important role in the success of knowledge management in general and knowledge sharing in particular in every organization (Valmohammadi, 2010).

Knowledge is a key source for organizations competitive advantage. Therefore, organization should investigate ways to increase its use of the knowledge it already possesses (Ladd andWard, 2002). The authors also described the four organizational cultures that have significant effect on knowledge sharing. These are:

Openness to Change/Innovation

An organization whose culture is characterized by openness to change and innovation would likely foster human-to-human contact and stress similarities between individuals. In addition, this culture promotes self-actualization, which is likely to increase individual knowledge.

Task-Oriented

Task-Oriented fosters a shared philosophy, which should increase the convergence of the goals shared by an organization and its membership. Also, an organization that stresses quality and attention to detail would likely attempt to maximize knowledge transfer efficiency (i.e., minimize depreciation).

Bureaucratic

Bureaucratic culture is the one that discourages interpersonal communication is likely to diminish relational channels. This culture encourages dependence and is likely to discourage the pursuit of individual knowledge.

Competition/Confrontation

Competitive/confrontational cultural types tend to discourage interpersonal relationships. Also, a culture that fosters a pursuit of power may put individual goals (e.g., advancement solely for personal gain) at odds with organizational goals.

The authors summarized that organization with cultural traits exhibiting openness to change and innovation as well as a task-centered orientation tended to be conducive to knowledge transfer. Conversely, organizations with cultural traits exhibiting a confrontational and competitive orientation tended not to be conducive to knowledge transfer.

If an organization naturally has a tendency to share knowledge, enabling knowledge sharing becomes a little easier. Therefore, every organization as well as the organization under study should give much attention to the culture of the organization in order to enhance and foster the knowledge sharing behavior among employees.

2.7.4.3 Organizational structure

Structure of an organization is one of the main factors that affect knowledge sharing among employees within organizations. There are three types of organizational structures these are organic, mechanic and performance based reward system.

Organic/Bio

According to Amiri et al. (2010), bio or organic structures are relatively flexible and adoptable, emphasize on parallel relations rather than vertical ones and influencing over them is based on skills and knowledge rather than status-related authorities. Responsibilities are defined flexible not based on terms of references, and the focus is on data sharing rather than commands. An organic structure is usable in a turbulent and high-changing environment.

Mechanic /Mechanistic

Mechanistic structures are recognized by traits such as high complexity and formality as well as centralization. Such structures are appropriate for repetitive functions and actions, are highly depended on planned behaviors and react to unpredicted events relatively slow. This structure creates a non-participatory environment that reduces communication, commitment, and involvement with tasks and projects among participants. A mechanistic design is usable in a sustainable and relied environment (Amiri et al., 2010).

Table 2. 3 The difference between mechanic and organic structure (Amiri et al., 2010)

Organic	Mechanistic	Characteristic
Flexible	Inflexible	Task description
Parallel	Vertical	Communications
Low	High	Formality
Skillfulness and know-how	Choice	Influence
Diversified	Centralized	Control

Performance-based reward system

According to Leonard (1995), organizational reward systems can determine how knowledge is accessed and how it flows in organizations. As mentioned by many scholars incentive systems should be in place to promote employees' motivation for taking the time to generate new knowledge, share their knowledge, and help others outside their own divisions or functions (Argote and Epple 1990; O'Dell and Grayson, 1998)**.**

The organizations knowledge sharing is also affected by its structure, so it is necessary to choose the proper structure to enable and foster knowledge sharing among the employees, departments and communities of the organization.

2.7.4.4 Social structure

Social structure is defined as the patterned or regularized aspects of the relationships existing among participants in an organization (Blankenship and Ruona, 2009). According to Chen and Huang (2007), social structures are a kind of social interaction

that organizational members interact with each other in terms of trust, communication, and coordination. Integrative work structure provides opportunities for employees to learn from their colleagues. By working together, sharing information, and watching out for one another, individuals could build communication and coordination channels to exchange relevant expertise and knowledge.

According to Blankenship and Ruona (2009), there are six social structure types that exist in organizations. The authors provide an overview and the key characteristics on which they vary.

Work Group

Work groups are groups of individuals in an organization who work together on a regular basis to attain common goals. Work groups such as business units or departments are typically found in functional or multidivisional organizational structures where activities are grouped according to logic of similarity in work functions. Some work groups may be consist of members who have similar roles, job assignments, or reporting to the same manager. Other work groups may be more structurally diverse that is, situations where members of the group are dispersed across different geographic locations, represent different functions, report to different managers, or work in different business units. Work groups are typically formed on the basis of a formalized organizational structure and are together until reorganization occurs.

Project Team

Project teams are made up of members with complementary skills who work together to achieve a common purpose for which they are accountable. Project teams are typically cross-functional and organized to complete a specific project or task, and their members are selected by management. This type of team typically stays together until the project or task is completed and then disbands. Because of the popularity of the team-based concept, project teams are found in several types of organizational structures, but are most commonly found in organizations with a matrix structure that combines the efficiency and flexibility found in functional and multidivisional structures.

Strategic Community

Strategic communities are formalized structures that consist usually of a limited number of experts within the organization who share a common, work related interest. These communities are intentionally created by the organization to achieve certain business goals. They are expected to perform for the company through development of innovative solutions and best practices. In addition, strategic communities are deliberately established by management. Strategic communities may resemble project teams in some cases; however, the scope of their work is broader and more strategic and the communities are typically much more highly supported with organizational resources.

Learning Community

Learning communities are structures that provide space for learning and sharing knowledge. The structure is referred to as a Professional Learning Community (PLC). PLC is a group of people sharing and critically interrogating their practice in an ongoing, reflective, collaborative, inclusive, learning-oriented and growth-promoting way. PLCs vary in size and membership, and activities are sanctioned and supported by the organizational leaders. Reflective dialogue, peer coaching, and study logs are some of the ways knowledge is shared within the community and made available outside the community.

Community of Practices (CoPs)

Community of practices (CoPs) are groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis. In addition communities of practice are groups of people who share a common purpose and who interact with the intent to share knowledge. CoPs are voluntary and emphasize the importance of the social aspect of learning in the formation of new knowledge and do not seem to place as much emphasis on the role of leaders external to the community or on the culture outside the community.

Informal Network

Informal networks in organizations provide space through which acquisition, sharing, and creation can take place. Networks emerge based on the relationships that individuals form with others. They are often the basis from which other social structures may emerge; however, networks based on both personal and professional relationships can exist independent of other social structures, both within and across organizations. Informal networks exist in various forms in organizations for various purposes and are where most of the real work gets done in organizations.

It is important to gain a deeper understanding of the potential role that social structures may play in an organization's overall KM strategy. In addition, identifying which social structure is necessary for which organizational structure is also another task that organizations have to give much attention in order to improve the organization knowledge management practice in general.

2.7.4.5 Information technology infrastructures

Technology is defined as material artifacts such as software and hardware used to perform duties in organization (Orlikowski, 1992). Without a solid IT infrastructure, an organization cannot enable its employees to share information on a large scale. That means information and communication technology (ICT) can enhance knowledge sharing by lowering temporal and spatial barriers between knowledge workers, and improving access to information about knowledge (Hendriks, 1999). Information technology facilitates and accelerates the process of knowledge sharing both intra and inter-organizations. In addition, IT plays an important transformational role in changing corporate culture to knowledge sharing (Gurteen, 1999). IT has the potential to affect the functions of coordination and communication within and inter organizations.

Information technology infrastructure has tools (synchronous and asynchronous) which accelerate the transfer of knowledge among individuals within the organization. Synchronous tool takes place when the participants communicate in real-time. It is characterized by immediate feedback, e.g. as in a face-to-face conversation. Examples of

synchronous tools are Telephone, Desktop-Videoconferencing, Fax, E-mail and Shared Workspace (Schueller and Basson, 2001). Asynchronous communication tools, on the other hand, a participant has to wait until the entire message, e.g. a fax page, has been transmitted and interpreted by the counterpart before a reply can be expected. This applies, for instance, to communication between team members in different time zones, when office hours do not overlap. In such a situation it is not routinely possible to use telephone or videoconferencing. One is compelled to leave messages in the form of faxes or e-mails. Tools that are used for asynchronous communication are Fax, E-mail and Shared Workspace. Asynchronous communication tools can be used in both environments (Schueller and Basson, 2001).

CHAPTER THREE

METHODOLOGY

3.1 Introduction

Research methods can be classified in various ways, one of the most common distinctions is between qualitative and quantitative research methods (Myers, 1997). According to Buber et al. (2004), qualitative and quantitative approaches have been distinguished and thereby defined on the basis of:

- ☞ The type of data used: textual or numeric; structured or unstructured
- ☞ The logic employed: inductive or deductive
- ☞ The type of investigation: exploratory or confirmatory
- ☞ The method of analysis: interpretive or statistical
- ☞ The approach to explanation: variance theory or process theory, and
- ☞ The presumed underlying paradigm positivist or interpretive/critical; rationalistic or naturalistic.

In addition, qualitative researchers attempt to make sense of, or provide an interpretation of, observed phenomena relative to meanings attributed to these phenomena by individuals involved in specific incidents or situations. Thus, qualitative researchers spend a lot of time in the field, working closely with research participants in their natural surroundings. The qualitative researcher and the research participant work together to document and develop interpretations of events or situations relative to a specific research question (Myers, 1997).

On the other hand, in the quantitative research the main objective is to investigate quantitative properties and phenomena and their relationships. The quantitative researcher can function independently of the participants of the research to a major degree, although some interaction is probably inevitable (Myers, 1997).

Furthermore, there is a method which is a combination of qualitative and quantitative methods. Researchers call this mixed method and it is a side-by-side or sequential use of

different methods or it may be that different methods are being fully integrated in a single analysis (Bazeley, 2002).

The research method is the heart of a research because it helps researchers to decide how they are going to achieve their stated objectives, what new data they need in order to shed light on the problem they are going to address and how they are going to collect data and process the data. Therefore, it needs much attention on choosing the appropriate methods which can provide the desired outputs.

3.2 Study Area

Mesfin Industrial Engineering P.L.C (MIE) was established in 1993 as the engineering wing of EFFORT (The Endowment Fund for the Rehabilitation of Tigray) with a paid up capital of Birr 7 million. MIE currently is mainly engaged in the manufacture of liquid and dry cargo bodies, trailers, semi-trailers, low beds and in the fabrication of fuel, storage tank and various equipments for the constructions and energy sectors such as cement components, and hydropower elements. It is also engaged in electromechanical evection and installation work, and includes erection of machinery and equipment of various industrial projects, civic buildings and fuel depots. During its existence MIE has shown tremendous growth and expansion. It now acquired net asset exceeding birr 200 million.

Mesfin Industrial Engineering is selected for the research because it is one of the four organizations that have adequate know-how about knowledge sharing in Ethiopia, though its implementation is poor. As it is an engineering organization it has also better performance to run with the new technology and accept any technological changes easily. For instance, MIE is using Enterprise Resource Planning (ERP) which is intended to manage all the functions and information flows of all the activities performed in the company in an integrated manner. The information made available through ERP system provides visibility for key performance indicator (KPIS) required for meeting corporate objectives. Therefore, this system enables the organization to have:

- ☞ Integrate financial Information

- ☞ Integrate customer order Information and store customer history
- ☞ Streamline the manufacturing process
- ☞ Standardizing HR Information
- ☞ Store and analyze productivity information for employees and facilities
- ☞ And allow inter-departmental process monitoring and reporting
- ☞ Reports with data from across the organization
- ☞ Allow marketing and management to monitor and analyze all stages required to provide the clients with the client with products and services and finally allow users limited and monitored access to data across the organization according to needs.

Furthermore, MIE is integrated KAIZEN which is Japan's management tool for quality service and products (Yohannes, 2010). The Kaizen or Lean Thinking tool begins with a conscious attempt to precisely define value in terms of specific products with specific capabilities offered at specific prices through a dialog with specific customers. In the production activities within organizations, utilization of the Kaizen philosophy also addresses continuous improvement not only in management, but also in the general workforce. This help organization in reducing wastes. The other reason that MIE is selected for this research is that there is very high employee turnover (Yohannes, 2011), and therefore, it is very important to identify the possible causes of losing high skilled manpower and key persons who contribute to the organization's performance.

3.3 Study design

The study design is one of the main parts of a research. Therefore, it is important to choose the appropriate research design in order to achieve the study objectives. Researchers can use different types of design depending on the type of problem, the knowledge already available about the problem and the resources available for the study. Accordingly, in this study both quantitative and qualitative research design is used. For the quantitative method self administered questionnaires are used whereas for the qualitative data collection methods such as in depth interview, observation and document analysis are used.

3.4 Study population

In MIE there are a total of 909 employees. 540 are permanent employees of the organization whereas the rest are short term and long term contract workers. The population of the study consists of the permanent employees in order to get detailed and relevant information about the knowledge sharing behavior at the individual as well as organizational level.

Sample population

The sample population for quantitative study was determined from the categories of office workers like design and technology center, manufacturing, electrical works and maintenance, mechanical works, planning and monitoring, project construction, Human resource management, finance and supply and ICT workers who are permanent and fulfill the following inclusion and exclusion criteria.

- ☞ **Inclusion criteria:** MIE office workers with a minimum qualification of diploma in any field of study with any years of experience.
- ☞ **Exclusion criteria:** employees who do not fulfill the minimum qualification criteria that is diploma and the employees who are not office workers like welders, garage workers and the like.

Qualitative data were also collected using an in depth interview to the general manager and 9 other managers of different departments.

3.5 Sample size

To ensure generalization of the study findings, the questionnaires were administered based on simple random sampling to MIE employees. A total of 180 surveys were distributed to the employees who fulfill the inclusion criteria. A total of 160 questionnaires were returned; of which ten incompletes were discarded. The final numbers of usable questionnaires were 150, representing 83.3% response rate.

3.6 Data collection procedure

Data collection for this study began in end of March 2011 and ended in middle of April 2011. The primary data for the research was gathered by using a self-administered survey questionnaire. The questionnaire was divided into two parts namely part 1 and part 2. Part 1 comprised questions eliciting demographic characteristics of respondents. Part 2 comprised 54 questions designed to ascertain the views of the employees of MIE on the significance of knowledge sharing, strategies to encourage knowledge sharing, strategies to identify the barriers in knowledge sharing, effects of information technology infrastructures, strategies to identify the reason of knowledge sharing of individuals and strategies to identify the knowledge sharing models that employees in the organization used.

The questionnaire is well designed, clear and applicable. Though most of the questions are adapted from Jain et al. (2007) and Foss et al. (2009), some modifications and contextualization are made in order to meet local context. A five point Likert scale was used and the respondents were required to state the extent to which they agreed or disagreed with the statements in the questionnaire.

The questionnaire was pre-tested by circulating it to 10 members of the employees in the organization to determine the understandability of the items included in the questionnaire. Since most of the employees are Tigrigna speakers, the pre-test was conducted to assure whether they can understand the questions. This is due to the fact that language can be one of the factors which can lead to misunderstanding and wrong interpretation of the results. Therefore, improvement and modification including rephrasing and rewording were done based on the feedback obtained.

3.7 Validity and reliability of data

Validity is concerned with the extent that a scale accurately represents the construct of interest. Where possible this should be supported by past research and consideration given to the practical things that affect the research (Hair et al., 1998). So, the validity of each question to collect data that focused on the present research objective was discussed

with 10 participants. The feedback also led to minor modifications aimed at increasing the questionnaires validity and clarity.

Cronbach's alpha was used to measure the reliability of items in part 2 of the questionnaire. Cronbach's alpha is a model of internal consistency based on the average inter-item correlation. Measures in this study are judged to be reliable if Cronbach's coefficient alpha is 0.7 or greater (Sekaran, 2000). Accordingly the consistency of the items in the questionnaire is presented in the table below.

Table 3. 1 Cronbach's Alpha of each item in the questionnaire

Description of items	Number of items	Cronbach's Alpha
Items related to employees' job satisfaction	4	0.92
Items related to views of knowledge sharing	12	0.70
Items related to factors of knowledge sharing	13	0.84
Items related to IT infrastructure	7	0.84
Items related to individual attitude on knowledge sharing	9	0.84
Items related to encouragement of KS	7	0.78

Source: Own survey, April 2011

3.8 Data analysis procedure

Once the quantitative data is collected, the information is cleaned, coded and fed to SPSS Version 16.0. After that the data was analyzed in order to achieve the objective of the study. Factor analysis and t- test value was used to analyze the collected data. The major aim of factor analysis is the orderly simplification of a large number of intercorrelated measures to a few representative constructs or factors (Robert, 2006). Factor analysis is based on the assumption that all variables are correlated to some degree. Therefore, those variables that share similar underlying dimensions should be highly correlated, and those variables that measure dissimilar dimensions should yield low correlations. The primary function of factor analysis is to identify these clusters of high intercorrelations as independent factors.

There are three basic steps to factor analysis:

1. Computation of the correlation matrix for all variables.

2. Extraction of initial factors.

3. Rotation of the extracted factors to a terminal solution.

Computation of the Correlation Matrix

As factor analysis is based on correlations between measured variables, a correlation matrix containing the intercorrelation coefficients for the variables must be computed. The variables should be measured at least at the ordinal level (Robert, 2006).

Extraction of Initial Factors

At this phase, the number of common factors needed to adequately describe the data is determined. There are two basic methods of extraction for obtaining factor solutions. They are **Principal Components** analysis and common **Factor Analysis** (Robert, 2006). The choice between these two basic methods of factor extraction lies with the objective

of the researcher. Therefore, since the purpose of this research is no more than to reduce data to obtain the minimum number of factors needed to represent the original set of data, then **Principal Components** analysis is appropriate for this study. In addition, the principal components method has attracted more widespread use (Robert, 2006). Therefore, the principal components method of extraction was used on this study.

In addition, t-test for independent variable was used on this study. The independent t-test is used for testing the differences between the means of two independent groups. It is particularly useful when the research question requires the comparison of variables (measured at least at the ordinal level) obtained from two independent samples (Robert, 2006). Therefore, comparison was made to identify which gender (male or female), which age group (25- 34, 35-44, 45-54 or 55-64) and which educational level holders (Diploma, bachelor's degree, Master's degree or PHD) have the better views of knowledge sharing and its practice.

Qualitative data was analyzed manually. Some speech marks from the qualitative data that best explain the factors influencing the knowledge sharing was identified and presented by the participants own words in parallel with the quantitative information to give more insight for the study.

CHAPTER FOUR

FINDINGS AND PRESENTATION OF DATA

4.1 Demographic distributions of respondents

The demographic and background variables used in this study are gender, age, educational level, respondents working experience, the way respondent become familiar with their job and the maximum time taken by each respondent to be familiar with their job. Table 4.1 below gives respondents' demographic profile:

Table 4. 1 Respondents' demographic profile

Respondents' Profile	**Classification**	**Frequency**	**Percentage**
Gender	Male	129	86.6
	Female	20	13.4
	No response	1	0.7
Age group	25-34	93	62.0
	35-44	30	20.0
	45-54	10	6.7
	55-64	0	0.0
	Others	15	10.0
	No response	2	1.3
Educational level	Diploma	45	30.0
	Bachelor's degree	97	64.7
	Master's degree	4	2.7
	PHD	0	0.0
	Others	3	2.0
	No response	1	0.7

Working experience	< 5	77	51.3
	5-9	26	17.3
	10-14	31	20.7
	15-19	9	6.0
	>20	0	0.0
	Others	0	0.0
	No response	7	4.7
How did employee	Via training only	16	10.7
become familiar	Training + Documented	58	38.7
with their job	materials		
	Via Documented materials only	13	8.7
	Via Self study	61	40.7
	Others	0	0.0
	No response	2	1.3
Time taken to be familiar	<=3 M	92	61.3
with their job	6 M	26	17.3
	1 Y	12	8.0
	>=2 Y	19	12.7
	Others	1	0.7
	No response	0	0.0
Total		**150**	**100.0**

Source: Own survey, April 2011

Based on the demographics and other personal background information obtained, a majority of the respondents were male (86.6%). The highest number of respondents comprise of the age group of 25-34 (62.0%). Most of the respondents are Bachelor's degree holders (64.7%), with working experience of < 5 years (51.3%). Reason why most of the respondents are with working experience of <5 years is there is very high employees turnover. The main factor for this problem to happen is inadequate salary as explained by the [General Manager] and [Project Manager] of the organization.

In addition, most of the respondents become familiar with their job via self study (40.7%). This way of acquiring knowledge of how things done is the most time taking process and have great impact on the organizations performance. That means it lets the organization back or without change till the employees become familiar with the job that they are responsible for. In addition, this shows there is no well documented knowledge of how things done for each department. The other one is, the time taken for each employee to be familiar with his/her job and most of the respondents took <=3 M (61.3%).

4.2 Job satisfaction

Job satisfaction of employees of MIE is assessed with the assumption that employees who are satisfied by their current job are more likely to engage in knowledge sharing than those that are not satisfied. The result presented in table 4.2 below.

Table 4. 2 Job satisfaction

	Frequency	Percentage
No	119	79.3%
Yes	25	16.7%
No response	6	4.0

Source: Own survey, April 2011

The result shows that most of the respondents (79.3%) are not satisfied. Further assessment is made to know the reason of dissatisfaction with their current job and the response is presented in Table 4.3 below.

Table 4. 3 Reasons of job dissatisfaction

Reasons of dissatisfaction	Mean scores
Inadequate or no opportunity for further education and training	1.42
Inadequate salary	1.45
Lack of reward and recognition for the work you did	1.53
Culture and structure of the organization	1.59

Source: Own survey, April 2011

Table 4.3 shows respondents' views on the reasons of dissatisfaction with their job. On a Likert's five point scale a value of 1 was assigned to 'Strongly agree', 2 'Agree', 3 'Neutral', 4 'Disagree', 5 'Strongly disagree'; as such, a low mean score represents high intensity of that variable in terms of reasons for dissatisfaction. The reasons have been arranged in ascending order of the mean value. It can be seen that Inadequate or no opportunity for further education and training and inadequate salary have been identified as the strongest reasons of dissatisfaction. Lack of reward and recognition for the work you did and culture and structure of the organization are also reasons of dissatisfaction as their rate is low as compared to the above two variables.

4.3 Views of knowledge sharing

In order to see if the view of knowledge sharing is better communicated in which gender, age group and educational level, a t-test was conducted. The results of views of

knowledge sharing from the perspectives of the three variables are presented in the following tables below.

Table 4. 4 Views of KS with respect to gender

T	Df	Sig diff.	**Mean scores**	
			Male	**Female**
-3.323	146	0.000	1.94	2.07

Source: Own survey, April 2011

Table 4.4 shows that views of knowledge sharing were much better understood and communicated among male employees of the organization. But in the study conducted by Lin (2007) shows that, since females have high altruism than males and so they tend to share knowledge more than men.

Table 4. 5 Views of KS with respect to age group

T	Df	Sig diff.	**Age –G**	**Mean**
			25-34	1.93
1.805	121	0.000	35-44	1.96
			45-54	2.15

Source: Own survey, April 2011

Table 4.5 shows that views of knowledge sharing were much better understood and communicated among employees with age group 25-34 as compared to the age group of 34-44 and 45-54. The main thing that the study wants to assure is the question that “is young person or the one who grows up in the high technology era better understand the importance of knowledge sharing”? The answer from the above data is “definitely yes”. Therefore, younger are better and more understood the importance of knowledge sharing and its practice.

Table 4. 6 Views of KS with respect to educational level

T	Df	Sig diff.	**Edulevel**	**Mean**
			Diploma	2.01
3.995	139	0.000	Degree	1.94
			Master's	2.06

Source: Own survey, April 2011

Table 4.6 shows that views of knowledge sharing were much better understood and communicated among employees who hold bachelor's degree with a mean score of 1.94 as compared to employees of master's degree and diploma holders. Here also there is one basic thing that the study needs to explore, that is "does the well educated persons have a better understanding and practice of knowledge sharing"? The answer from the above data is not "definitely yes". Because in this study the well educated persons are employees who hold master's degree and it was expected that these persons will have better understanding and views of knowledge sharing. But the result shows that the employees with bachelor's degree holders who are less educated as compared to master's degree holders have better understanding of knowledge sharing. Further assessment is made to know why the well educated one does not understand the importance of knowledge sharing well and the main reason is their age. Almost all of the employees with master's degree holders are in the age group of 45-54.

4.4 Factors affecting knowledge sharing

The major aim of factor analysis is the orderly simplification of a large number of intercorrelated measures to a few representative constructs or factors, the author uses the factor analysis to simplify and present the main factors that affect knowledge sharing from the total given 29 factors which are related to technology factors, individual attitude factors and organizational factors. The SPSS result is presented below:

Table 4. 7 Correlation matrix

tistics	lack of reward and recogniti on that motivate to knowled ge owners	lack of time to share	lack of formal and informal activities that cultivate knowled ge sharing	support provided by the organiza tion to share knowled ge	lack of interacti on between knowled ge owner and knowled ge reciever	no system that identify the colleagu es with whom i need to share knowled ge	Retentio n of highly skilled staff is not a high priority in my organiza tion	physical work environ ment and layout of work areas restrict effective knowled ge sh	lack of trust among colleagu es in my organiza tion	fear of knowled ge being misused by taking unjust credit for it	difficult to convince colleagu es on the value of the knowled ge that i possess	employe es do not share because they think knowled ge is power	employe es do not share because of poor verbal/wr itten commun ication skill	IT system and process es are in place in my organiza tion	i use internet, e-mail and electroni c bulletin boards to share knowled ge	i use organiza tional intranet to share with colleagu es	there is portal	my organiza tion has user-friendly it system which are used for knowled ge sharing
lack of reward and recognition that motivate to knowledge owners	1.000	.385	.611	.419	.059	.319	.276	.281	.094	-.049	-.035	-.018	-.136	-.280	-.188	-.224	-.268	-.255
lack of time to share	.385	1.000	.647	.548	.334	.320	.269	.452	.325	.226	.160	.135	.037	-.229	-.128	-.131	-.155	-.077
lack of formal and informal activities that cultivate knowledge sharing	.611	.647	1.000	.623	.258	.495	.420	.421	.239	.082	-.011	.020	-.043	-.336	-.280	-.305	-.298	-.247
support provided by the organizatio n to share knowledge	.419	.548	.623	1.000	.319	.631	.503	.493	.376	.257	.086	.077	-.002	-.447	-.377	-.398	-.469	-.383
lack of interaction between knowledge	.059	.334	.258	.319	1.000	.432	.317	.252	.396	.356	.212	.214	.190	-.005	-.039	-.109	.000	-.051

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.783
Bartlett's Test of Sphericity	Approx. Chi-Square	2.319E3
	df	406
	Sig.	.000

Communalities

	Initial	Extraction
Lack of reward and recognition that motivate to knowledge owners	1.000	.608

Lack of time to share	1.000	.660
Lack of formal and informal activities that cultivate knowledge sharing	1.000	.791
Support provided by the organization to share knowledge	1.000	.736
Lack of interaction between knowledge owner and knowledge receiver	1.000	.663
No system that identify the colleagues with whom i need to share knowledge	1.000	.627
Retention of highly skilled staff is not a high priority in my organization	1.000	.610
Physical work environment and layout of work areas restrict effective knowledge sharing	1.000	.563
Lack of trust among colleagues in my organization	1.000	.672
Fear of knowledge being misused by taking unjust credit for it	1.000	.812
Difficult to convince colleagues on the value of the knowledge that i possess	1.000	.665
Employees do not share because they think knowledge is power	1.000	.547
Employees do not share because of poor verbal/written communication skill	1.000	.452
IT system and processes are in place in my organization	1.000	.583

I use internet, e-mail and electronic bulletin boards to share knowledge	1.000	.725
I use organizational intranet to share with colleagues	1.000	.765
There is portal	1.000	.824
My organization has user-friendly it system which are used for knowledge sharing	1.000	.690
I store my knowledge and work experience in the organization's database, portal or intranet	1.000	.550
I store my knowledge and work experience in manual papers	1.000	.765
I share coz I like	1.000	.756
I share coz satisfying	1.000	.757
I share coz I feel proud of my self	1.000	.544
I share coz I want my superior to think am good employee	1.000	.707
I share coz I want my colleagues to think am competent	1.000	.771
I share coz I want my supervisors to praise me	1.000	.881
I share coz I want my colleagues to praise me	1.000	.793
I share coz I might get a reward	1.000	.810

I share coz it may help me get promoted	1.000	.689

Extraction Method: Principal Component Analysis.

Table 4.7 shows the Correlation Matrix which is used to check the relationships of the 29 variables among each other. The variables which have the intercorrelation coefficients greater than 0.4 are highly correlated to each other.

The KMO and **Bartlett's test of sphericity** can be used to test for the adequacy of the correlation matrix, i.e., the correlation matrix has significant correlations among at least some of the variables. The KMO statistics varies between 0 and 1. A value of 0 indicates the sum of the partial correlation is large relative to the sum of correlations, indicating diffusion in the patern of correlations. Hence, factor analysis is likely to be inappropriate. A value close to 1 indicates that patterns of correlations are relatively compact and so factor analysis should yield distinct and reliable factors.

Therefore, in the present analysis the KMO value is 0.783 which is good value and the author is confident that factor analyis is appropriate for these data. Bartlett's test of sphericity tests the hypothesis that the correlation matrix is an identity matrix, that is, all the diagonal terms are 1 and all off-diagonal terms are 0. If the test value is large and the significance level is small (< 0.05), the hypothesis that the variables are independent can be rejected (Robert, 2006). In the present analysis, the Bartlett's test of sphericity yielded a value of 2.319E3 and an associated level of significance smaller than 0.001. Thus, the hypothesis that the correlation matrix is an identity matrix is rejected and factor analysis is appropriate.

The **Communalities** section presents the communality of each variable (i.e., the proportion of variance in each variable accounted for by the common factors). In using the principal components method of factor extraction, it is possible to compute as many factors as there are variables. When all factors are included in the solution, all of the variance of each variable is accounted for by the common factors. Thus, the proportion of variance accounted for by the common factors, or the **communality** of a variable is 1 for all the variables.

Table 4. 8 Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.400	25.518	25.518	7.400	25.518	25.518	4.490	15.484	15.484
2	3.894	13.427	38.945	3.894	13.427	38.945	4.462	15.386	30.870
3	2.633	9.078	48.023	2.633	9.078	48.023	3.808	13.131	44.001
4	2.091	7.210	55.233	2.091	7.210	55.233	2.752	9.489	53.490
5	1.599	5.515	60.749	1.599	5.515	60.749	1.695	5.845	59.335
6	1.241	4.279	65.027	1.241	4.279	65.027	1.439	4.961	64.295
7	1.159	3.996	69.023	1.159	3.996	69.023	1.371	4.728	69.023
8	.955	3.291	72.315						
9	.849	2.927	75.242						
10	.764	2.633	77.875						
11	.733	2.529	80.404						
12	.638	2.200	82.604						
13	.594	2.047	84.652						
14	.538	1.855	86.507						
15	.523	1.804	88.311						
16	.459	1.583	89.893						
17	.410	1.414	91.308						
18	.375	1.294	92.602						
19	.318	1.098	93.700						
20	.311	1.072	94.772						
21	.256	.883	95.655						
22	.230	.792	96.447						
23	.218	.753	97.200						
24	.191	.657	97.857						
25	.180	.622	98.479						
26	.151	.522	99.000						
27	.124	.426	99.426						

28	.090	.310	99.736						
29	.076	.264	100.000						

Extraction Method: Principal Component Analysis.

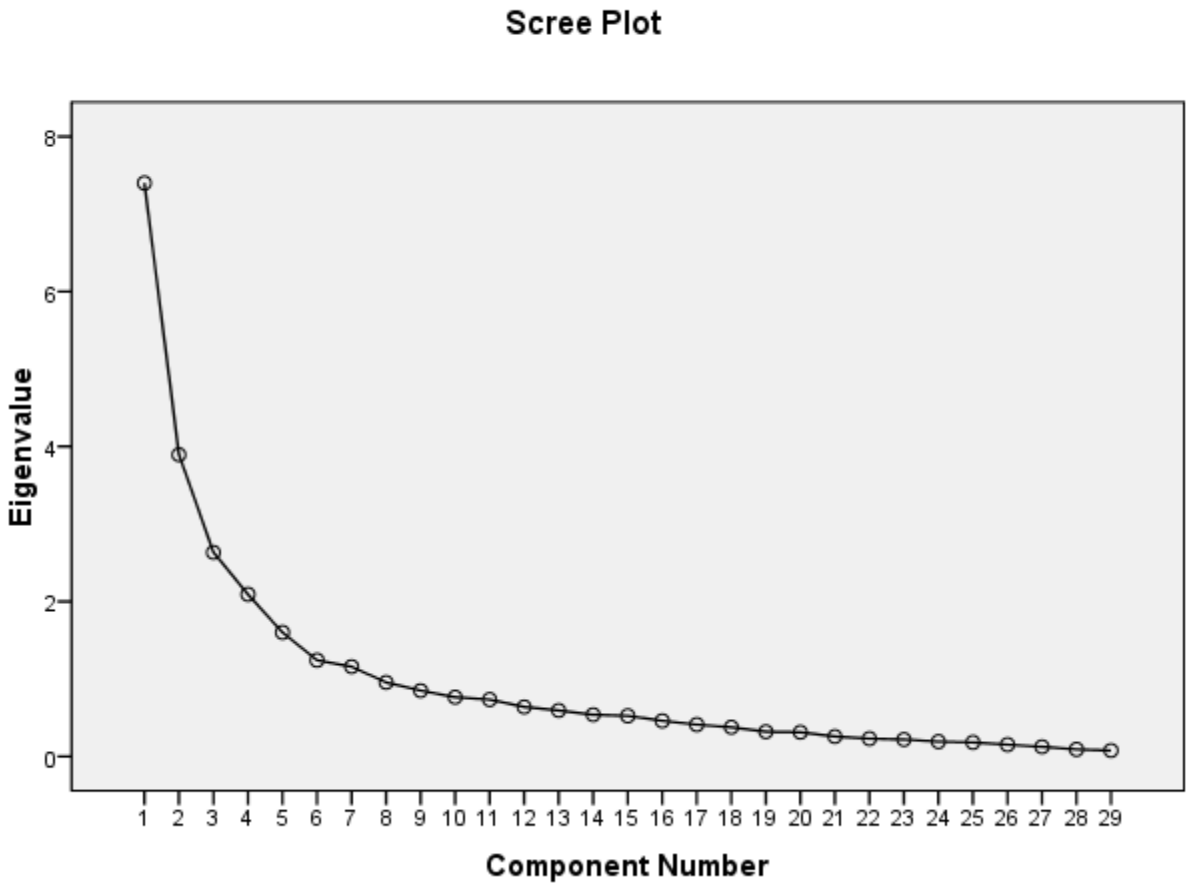

Figure 4. 1 Scree plot

Table 4.8 shows the total variance explained section and this presents the number of common factors computed, the eigenvalues associated with these factors, the percentage of total variance accounted for by each factor, and the cumulative percentage of total variance accounted for by the factors. Although twenty-nine factors have been computed, it is obvious that not all twenty-nine factors will be useful in representing the list of twenty-nine variables. In deciding how many factors to extract to represent the data, it is

helpful to examine the eigenvalues associated with the factors. Using the criterion of retaining only factors with eigenvalues of 1 or greater, the first seven factors will be retained for rotation. These seven factors account for 25.52%, 13.43%, 9.07%, 7.21%, 5.52%, 4.28%, and 3.99% of the total variance, respectively. That is, almost 69% of the total variance is attributable to these seven factors. The remaining twenty-two factors together account for only approximately 31% of the variance. Thus, a model with seven factors may be adequate to represent the data. From the Scree plot in Figure 4.1, it again appears that a seven-factor model should be sufficient to represent the data set.

Table 4. 9 Component matrix[a]

	Component						
	1	2	3	4	5	6	7
There is portal	.731		.479				
I use organizational intranet to share with colleagues	.707						
I use internet, e-mail and electronic bulletin boards to share knowledge	.700						
My organization has user-friendly it system which are used for knowledge sharing	.689						
Support provided by the organization to share knowledge	-.682	.449					
No system that identify the colleagues with whom I need to share knowledge	-.673						
I share coz I might get a reward	.657	.432					
I share coz I want my supervisors to praise me	.654	.417	-.497				

I share coz I want my superior to think am good employee	.638						
I share coz I want my colleagues to praise me	.611		-.492				
IT system and processes are in place in my organization	.609						
Lack of formal and informal activities that cultivate knowledge sharing	-.606			.472			
I share coz I want my colleagues to think am competent	.603	.413					
I share coz it may help me get promoted	.510	.402	-.439				
I store my knowledge and work experience in the organization's database, portal or intranet	.510						
I share coz I feel proud of my self	.495						.433
Retention of highly skilled staff is not a high priority in my organization	-.494						
Fear of knowledge being misused by taking unjust credit for it		.672					
Lack of trust among colleagues in my organization		.636					
Lack of interaction between knowledge owner and knowledge receiver		.598				-.401	

Difficult to convince colleagues on the value of the knowledge that I possess		.513					
Physical work environment and layout of work areas restrict effective knowledge sharing	-.406	.501					
Lack of time to share	-.413	.489					
Employees do not share because they think knowledge is power		.478					
I share coz I like				.618	.552		
Lack of reward and recognition that motivate to knowledge owners	-.458			.516			
Employees do not share because of poor verbal/written communication skill				-.416			
I share coz satisfying				.450	.590	-.403	
I store my knowledge and work experience in manual papers						.635	

Extraction Method: Principal Component Analysis.

a. 7 components extracted.

Table 4.9 shows the Component matrix which represents the unrotated component analysis factor matrix, and presents the correlations that relate the variables to the seven extracted factors. These coefficients, called factor loadings, indicate how closely the variables are related to each factor. However, as the factors are unrotated (the factors were extracted on the basis of the proportion of total variance explained), significant cross-loadings have occurred. For example, the variable “there is portal” has loaded highly on Factor 1 and Factor 3; the variable “I share coz I want my supervisors to praise me” has loaded highly on Factor 1, Factor 2 and Factor 3; the variable “I share coz it may

help me promoted" has loaded highly on Factor 1, Factor 2 and Factor 3. There are also others which have loaded on many factors. These high cross-loadings make interpretation of the factors difficult and theoretically less meaningful. Therefore, the component matrix should be rotated to make it more meaningful and easy for interpretation.

Table 4. 10 Rotated component matrix[a]

Variables	Component						
	1	2	3	4	5	6	7
There is portal	.865						
I use organizational intranet to share with colleagues	.814						
I use internet, e-mail and electronic bulletin boards to share knowledge	.795						
My organization has user-friendly it system which are used for knowledge sharing	.761						
I store my knowledge and work experience in the organization's database, portal or intranet	.725						
IT system and processes are in place in my organization	.682						
I share coz I want my supervisors to praise me		.917					
I share coz I want my colleagues to praise me		.867					
I share coz I might get a reward		.827					
I share coz I want my colleagues to think am competent		.809					
I share coz I want my superior to think am good employee		.773					

I share coz it may help me get promoted		.751					
Lack of formal and informal activities that cultivate knowledge sharing			.850				
Lack of time to share			.767				
Support provided by the organization to share knowledge	-.416		.712				
Lack of reward and recognition that motivate to knowledge owners			.663				
Physical work environment and layout of work areas restrict effective knowledge sharing			.614				
Retention of highly skilled staff is not a high priority in my organization			.524				
No system that identify the colleagues with whom I need to share knowledge	-.510		.515				
Fear of knowledge being misused by taking unjust credit for it				.828			
Difficult to convince colleagues on the value of the knowledge that I possess				.788			
Employees do not share because they think knowledge is power				.698			
Lack of trust among colleagues in my organization				.694			
I share coz satisfying					.837		
I share coz i like					.779		

Lack of interaction between knowledge owner and knowledge receiver			.417			.572	
I share coz I feel proud of my self						.514	
Employees do not share because of poor verbal/written communication skill						.410	
I store my knowledge and work experience in manual papers							.849

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 10 iterations.

Examination of the factor loadings presented in the Varimax rotated component matrix (Table 4.10) shows that twenty-six of the twenty-nine variables loaded highly on the seven factors. Three variables are cross-loaded on more than one factor. These are:

- ☞ Support provided by the organization to share knowledge is cross-loaded significantly across Factor 1 and Factor 3.
- ☞ No system that identifies the colleagues with whom I need to share knowledge is cross-loaded significantly across Factor 1 and Factor 3.
- ☞ Lack of interaction between knowledge owner and knowledge receiver is cross-loaded significantly across Factor 3 and Factor 6.

Convention suggests three possible ways of handling significant cross-loadings (Robert, 2006).

1. If the matrix indicates many significant cross-loadings, this may suggest further commonality between the cross-loaded variables and the factors. The researcher may decide to rerun factor analysis, stipulating a smaller number of factors to be extracted.

2. Examine the wording of the cross-loaded variables, and based on their face-validity, assign them to the factors that they are most conceptually/logically representative of.
3. Delete all cross-loaded variables. This will result in "clean" factors and will make interpretation of the factors that much easier. This method works best when there are only few significant cross loadings.

In the present analysis, the cross-loaded variable of Support provided by the organization to share knowledge appears to be more conceptually relevant to Factor 3 than to Factor 1, No system that identifies the colleagues with whom I need to share knowledge appears to be more conceptually relevant to Factor 1 than to Factor 3 and Lack of interaction between knowledge owner and knowledge receiver appears to be more conceptually relevant to Factor 6 than to Factor 3. Thus, the decision may be made to retain these variables to represent Factor 3, Factor 1 and Factor 6 respectively. Alternatively, the researcher may decide to delete these variables. In any case, no further analysis (rotation) is required as the factor structure is clearly consistent with the hypothesized seven factor model.

Once the factors are identified, it is the researcher's role to give appropriate name for the identified factors. Therefore, the twenty- nine factors are simplified to seven main factors that affect organizations in general and MIE in particular. The rest are insignificant and discarded. The seven factors are:

- ☞ Information technology infrastructures
- ☞ Personal benefits
- ☞ Management problems
- ☞ Individual attitudes
- ☞ Individual willingness
- ☞ Interaction and communication skills and
- ☞ Knowledge storage mechanisms

4.5 Knowledge sharing models

Table 4. 11 Models of KS

KS Models	Mean score
Codification	3.09
Personalization	2.41
Individualization	2.22
Institutionalization	2.91

Source: Own survey, April 2011

Table 4.11 Shows the knowledge sharing models that most of the employees currently used is individualization (2.22) followed by personalization (2.41). In addition, the table shows that the employees are unable to decide on the existence of knowledge sharing models such as codification and institutionalization. But there is a controversy between the employees' response and top managers' response on the existence of these four models of knowledge sharing in the organization. One interviewee provided the following answer:

> "As the organization is learning organization there is knowledge sharing concept and we already start to introduce it with our employees, but it is on the very infant stage. Therefore, we do not have any knowledge sharing models in our company at this moment."[General Manager]

Another interviewee:

> "There is knowledge sharing know-how in our organization since our organization is a knowledge-based company, but its implementation is at the starting phase. For example, we have in company knowledge sharing that red (new employees) to be supported by blue (employees that need some supervision) and the blue employees to be supported by Green (employee that are perfect)

about the subject matter. However, there is no guide or model of knowledge sharing in the organization."[Project Manager]

Therefore, the answers provided by the employees have some inconsistency; this also shows that they do not have clear information or know-how about the knowledge sharing models and their existence.

4.6 Encouragement of knowledge sharing

Table 4. 12 Encouragement of KS

Encouragement of KS	**Mean score**
Knowledge sharing can become a culture in the organization if top management regularly displays and reinforces the theme that knowledge is the lifeblood of an organization.	1.68
Technology plays a significant role in promoting Knowledge Sharing.	1.44
The organization should encourage the employees to publish their knowledge on the organization's database/website or other manual papers that others could access it.	1.72
Knowledge sharing can be encouraged if it is linked with the performance evaluation of the employees.	1.68
Knowledge sharing can be encouraged if it is clearly linked with rewards.	1.82

Non-monetary rewards (such as appreciation, recognition) shall be more effective in encouraging knowledge sharing than monetary (financial or economic) rewards.	2.13
Knowledge sharing can be encouraged if there is a designated knowledge officer in the organization.	1.97

Source: Own survey, April 2011

Table 4.12 shows respondents' views were sought on the ways to promote knowledge sharing. A very strong case was observed for promoting KS through availability of technology that is used for knowledge sharing in the organization (1.44). Another strong case was observed for promoting KS through regular emphasis by the top management of the organization (1.68). This means that people would be more willing to share their knowledge if they felt that the top management wants it. It can also be observed from this table that there is a strong case for linking KS with the performance evaluation of the employees (1.68). Besides, respondents feel a strong need for the organization to encourage employees to publish knowledge on its database/website or other manual papers that others could access it (1.72). In addition, respondents feel that organization need to provide reward such as non- monetary and monetary for these who contribute knowledge to the organization. Existence of designated knowledge officer in the organization also encourages knowledge sharing among employees.

Interview questions that are related to the encouragement of knowledge sharing were asked and respondents provide the following answers:

> "Knowledge sharing will be encouraged if the existing culture of employees as well as the organization is changed."[General Manager]

> "Knowledge sharing will be fostered if orientations about knowledge sharing are provide for the employees of the organization, if there is emphasis on internal training rather than expected only from peoples outside of the organization and if

there is reward mechanisms for theses who contribute knowledge to the organization."[Project Manager]

"Knowledge sharing will be promoted if there are well organized IT infrastructures, rewards and recognition and a designated knowledge officer in the organization."[IT Manager]

CHAPTER FIVE

KNOWLEDGE SHARING MODELS

5.1 Introduction

Knowledge is a vital source of competitive advantage and when it is integrated effectively, it can create or add value to organizations in the long run. Knowledge creation, sharing and dissemination are the main activities in knowledge management. Being part of knowledge management (KM) process, Knowledge sharing (KS) is the exchange of experience, events, thoughts or understanding of anything. In general, people expectations from knowledge sharing are to gain more insights and understanding about concepts or practical applications, thereby improving learning and expertise. Thus, knowledge sharing can be considered as a significant ingredient for mutual learning and intellectual development to individuals in every aspect of their life (Mustafa and Nuhu, 2009). Focusing on knowledge sharing is the main backbone to assure effective knowledge management implementation in every organization. This is due to the fact that knowledge is meaningless unless it is shared among individuals who are the knowledge owners and knowledge receivers. Therefore, to enable effective sharing of knowledge across individuals within and outside every organization, knowledge-sharing mechanisms (models) are the means by which individual access knowledge and information from their colleagues.

There are two distinct dimensions of knowledge-sharing models or knowledge sharing mechanisms among individuals. These are personalization versus codification and individualization versus institutionalization. None of the two models exists in the organization under study. Therefore, the author proposes these models for organizations in general and the organization under study in particular so as to facilitate knowledge sharing among employees within the organization and other experts that are found outside the organization. Detail descriptions of these two models and how they are used in MIE are the main focus of this chapter of this study.

5.2 Codification versus personalization

5.2.1 Codification

Organizations can facilitate the sharing of knowledge between individuals by using codification. To share knowledge through a codification mechanism, knowledge should be carefully codified and stored in databases and documents, where it can be accessed and used easily by employees in the company. According to Boh (2007), codification can be a good mechanism to store large amounts of knowledge and to create an organizational memory for all employees. The rise of networked computers has made it possible to codify, store and share certain kinds of knowledge more easily and cheaply than ever before. However, it is impossible to use codification knowledge sharing model without identifying the task routines of the organization, or the nature of their business. If an organization provides a standardized product or solution to its client, a codification strategy would leverage the ability to reuse the organization's knowledge (Boh, 2007). Technical consulting firms, whose task nature tends to be more standardized, benefit more from a codification strategy. This is because the ability to build a reliable, high-quality information system faster and at a better price than others by using work plans, software code, and solutions that have been fine-tuned and proven successful provides more benefits to the customer. Therefore, codification knowledge-sharing mechanism is more suitable for organizations conducting tasks or encountering problems that are more standardized and routine in nature.

Having the basic concepts of codification and when and in what types of organization to apply it, the author tried to identify the nature of the business and the task routine of the organization under the study (MIE). MIE is a technical firm and its task nature is standardized. That means MIE provides a standardized product or solution to its customers. Therefore using codification mechanism of knowledge sharing is very important as it shortens the time taken by the new employees to understand what to do and how to do it. In addition, if the knowledge is coded on the organization's database/website or manuals every time new employees join to the organization they will continue working without wasting any time on reinventing the wheel.

An interview was made to know employees' view on the codification knowledge sharing model and the answers are provided below:

> "Though knowledge sharing is new concept, I have some know-how about its importance, but I do not have adequate knowledge on its implementation. Currently, our organization is providing training for new employees as a means of knowledge sharing and this costs huge time of the organization (minimum of three months). This is also costly if we think it in terms of financial cost. Therefore, applying codification model of knowledge sharing is the best solution. That means, if knowledge of well experienced experts is coded, occurrence of problems, when the expert is resigned from the organization is rear because the organization can have new employee without any cost for training and others since the knowledge of how the tasks performed is already codified and available to the new employees." [A member of civil engineering employees]

> "Currently, our employees are categorized into three groups: red employees who are new employees, green employees who have some knowledge but need some supervision and independent employees these who know well about the subject. Our means of knowledge sharing, in addition to training is to support red employees by the green employees and green employees by the independent employees. Though this is very good way of sharing, it has some problems. There is wastage of time, for instance, the green employees have their own works which are responsible for, and so if they spend their time on helping the red employees they may not finish their work on time. The same thing may happen for the independent employees. This may have some negative impacts on the organization's objective. Had codification been is well integrated in our organization the above bankruptcies wouldn't have happened and every employee would have dedicated on his/her work by referring to the codified knowledge at the time of difficulties."[Project manager]

However, codification mechanisms do not provide a rich medium for communication. This is the main problem of codification. Because the richer the medium for

communication, the better it enables the customization of information to suit the context and the more it enables interactions to seek clarification and aid further reinterpretation of the knowledge. Hence, while codification may be an efficient strategy for transmitting a large amount of information, it does not allow interactions and customization of solutions to the knowledge seeker's problems. Therefore, using another knowledge sharing models in addition to this model is very important for effective knowledge sharing within the organization's employees.

5.2.2 Personalization

In the personalization mechanism of knowledge sharing, knowledge will be closely tied to the person who developed it and shared mainly through direct person-to-person contacts (Boh, 2007). Though personalization is used for firms that tend to tackle problems that do not have clear solutions at the outset, it can be used for any organization since they benefit more from personalization strategies. This is due to owning the fact that the model allows them to engage their colleagues in discussions to seek a highly customized solution to each unique problem. Individuals, in the process of doing their work, generate knowledge that largely remains in their heads and in the memory aids that they create for themselves (Olivera, 2000).

Since personalization as knowledge sharing mechanism has the inherent flexibility of transmitting tacit knowledge, and allowing for discussions and sharing interpretations that may lead to the development of new knowledge, the author proposes for MIE to use this knowledge sharing mechanism in addition to codification. Furthermore, personalization provides a rich medium for communication contrary to codification. This is because of the case that personalization is concerned with the use of people as a mechanism for sharing knowledge (Argote, 1999). This also enables the customization of information to suit the context and the more it enables interactions to seek clarification and aid further reinterpretation of the knowledge for the knowledge seekers. Some views from the employees of MIE were provided as follows:

> "Though the organization does not recommend or set it as a guide or model for knowledge sharing, most of the time we use it to share it our knowledge among

us. For example, if I do not know how something is done in my department I usually ask someone in my department and we discuss on it for further clarifications. If this way of sharing come from the organization as a model of knowledge sharing most of the employees may accept as a rule and ask everything they do not know and get knowledge easily. Some people are ashamed of asking questions to their colleague because they relate it with their respect or feels superiority and tried to search by themselves and take time even for a simple thing. But, if the organization gives orientation about this knowledge sharing even these people can take it as a rule and adapt the environment."[A member of design and technology]

5.3 Institutionalization versus individualization

5.3.1 Institutionalization

As an organization grows in size and geographical dispersion, it needs to facilitate knowledge sharing beyond small and collocated groups. When organizations have employees distributed across different geographical areas, the remote work situation reduces the probability that employees would come into contact with others who may have the relevant experience for them to draw upon. It also reduces the availability of information about ''who knows what'' for professionals to know whom to approach in order to locate the person with the right experience to share (Finholt, 1993). That means in a large and geographically dispersed organization, it is a challenge to find ways of making the connections between individuals who have the right knowledge to share with one another. The probability of serendipitous encounters drop drastically. It also becomes significantly more difficult to locate individuals with a specific solution to a problem in a large and dispersed organization. According to Jones (1986), institutionalization dimension describes socialization tactics that are collective and formal in terms of the contexts in which organizations provide information to newcomers. In addition, institutionalized knowledge-sharing mechanisms are characterize by the use of mechanisms that are formal (established and endorsed by the organization, who have put in place the necessary supporting infrastructure to encourage the use of the mechanism) and structured (pre-defined and embedded in various organizational routines, artifacts, or

organizational structure). These mechanisms have a wider reach, or are usually accessible to a large group of individuals in the organization (Boh, 2007).

Institutionalized knowledge sharing provides the opportunity for organizations to increase the probability of useful knowledge sharing and to push information and knowledge to others, instead of simply depending on individuals to pull knowledge from the right sources. Institutionalized knowledge-sharing mechanisms allow organization to amplify the knowledge embedded in individuals to the collective level, so that the knowledge is easily accessible to all employees who need to make use of it (Nonaka, 1994). As knowledge is shared in a systematic manner to a wider group of individuals, the knowledge not only becomes embedded in more individuals, synergy is also created in sharing, reusing, discussing and re-interpreting the knowledge. Institutionalized mechanisms, therefore, enable organizations to more effectively exploit the knowledge in the organization, by creating reliability in repeated experiences, and refining knowledge through repeated use and reflections (March, 1991).

Institutionalized knowledge-sharing mechanisms, however, require organizations to invest a significant amount of time and resources to put in place the supporting infrastructure, systems, routines, rules and procedures, artifacts, and organizational structure and strategy. Moreover, institutionalization of knowledge- sharing mechanisms require the organization to specify areas of focus that have potential for exploitation, thus locking the organization into specific areas of knowledge and pre-defined ways to share knowledge. This reduces the responsiveness and flexibility of the organization (March, 1991).

Therefore, the institutionalization of knowledge-sharing mechanisms would help large and geographically dispersed organizations facilitate knowledge sharing across a wider geographical scope, and across a larger group of individuals. Hence, this model of knowledge-sharing is more suitable for large and geographically dispersed organizations though it has the above limitations.

MIE is an organization the main office of which is found in Mekelle. This organization has many branches both in Mekelle and Addis Ababa. Therefore, it is possible to conclude that it is a large and geographically dispersed organization. Hence, the institutionalization of knowledge sharing model in this organization would be effective since its employees are distributed across these different branches, and that the probability that employees would come into contact with others who may have the relevant experience for them to draw upon is difficult. Furthermore, it is difficult to have available information about who knows what for professionals to know whom to approach in order to locate the person with the right experience to share. As a result, integrating the institutionalization knowledge sharing in addition to codification and personalization is very important for effective knowledge sharing among employees of the organization. Some views about this model from the employees of MIE are provided as follows:

> "Knowledge sharing is our main focus at this time and we have some know-how as our company is a learning organization. But we do not have the institutionalization knowledge sharing model, rather we discuss using phone to exchange information like to identify to whom that a subject is concerned if some difficulties face in one of our branches. This is somewhat costly."[General Manager]

> "There is no detailed information prepared by the organization about the different tasks and to whom they concern. Therefore, using the institutionalized knowledge sharing model may be important to our organization."[Member of electrical works]

5.3.2 Individualization

Individualization dimension describes socialization tactics that are individual and informal (Jones, 1986). It is a mechanism that is used to support knowledge sharing at the individual level. Individualized mechanisms tend to be based on the random decisions of individuals and are unique to individuals or small groups. These mechanisms also tend to be ad hoc individual level initiatives that are informal (occurring naturally without

external intervention) and unstructured (usually ad hoc and unplanned) (Boh, 2007). Individualized knowledge-sharing mechanisms allow knowledge sharing to take place using an informal and decentralized approach, where the organization does not dictate the areas for knowledge sharing to take place. This approach encourages a free-flow and unstructured form of knowledge-sharing to take place as and when the need arises (Bhatt, 2001). This increases the responsiveness and flexibility of the organization.

In MIE, most of the respondents view that individualization knowledge sharing mechanism is the main way of knowledge sharing among the employees though the organization does not inform the employees to share their knowledge through that sharing mechanism. This is because of the fact that there is a habit that individuals are used to ask each other if difficulties occur when they are working. Two interviewees provided their view on the existence of individualization knowledge sharing as follows:

> "Individualization knowledge sharing has already been adapted to individual employees. Thus, if the organization integrate it, in addition to the other models, the employees could become more informed and use it for effective knowledge sharing in our organization"[Finance Manager]

> "Individuals in our organization have already been using this knowledge sharing in our organization; but, this did not come from the organizational level. Therefore, the organization should orient its employees about the way of knowledge sharing in the company for better usage of such kind of knowledge sharing mechanisms."[A member Human Resource Management]

Individualized knowledge sharing, however, suffers from problems of scalability. Individualized mechanisms make knowledge sharing serendipitous and reliant on whether employees happen to speak to the right person about their problems and needs at the right time. This becomes an especially significant problem as the organization expands in size and geographical distribution as it becomes much more difficult to search for knowledge embedded in a large group of geographically distributed individuals.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Summary

The main purpose of this research was to investigate the knowledge sharing behavior of employees of MIE so as to identify the main factors that affect knowledge sharing in the organization, the way of knowledge sharing that employees currently use to share their knowledge among themselves, how to encourage knowledge sharing in the organization and propose knowledge sharing models that foster knowledge sharing behavior of individual employees in the organization.

In addition, comparisons was made using t-value to determine which employees are either male or female, which age group 25-34, 35-44, 45-54 or 55-64 and which educational level diploma, bachelor's degree, master's degree or PHD holders have the better understanding, communication and practice of knowledge sharing.

Accordingly, the result of the study shows that knowledge sharing was much better understood and communicated among male employees of the organization. With regard to age groups knowledge sharing was much better understood and communicated among employees in the age groups of 25-34 years as compared to the age group of 34-44 and 45-54. This also assures that the young ones that grew up in the technology era better understand the knowledge sharing practices as compared to the older ones. Results related to the educational level shows that the employees with bachelor's degree who are less educated as compared to master's degree holders have better understanding of knowledge sharing. Further assessment was made to know why the better educated ones (master's holders) do not understand the importance of knowledge sharing well and the main reason is their age. Almost all of the employees with master's degree holders are in the age group of 45-54.

Employees' satisfaction on their current job was also assessed and most of the employees (79.3%) are not satisfied. Further assessment was made to know the reasons of

dissatisfaction with their current job and the respondents stated that inadequate or no opportunity for further education and training and inadequate salary have been identified as the strongest reasons of dissatisfaction. Lack of reward and recognition for the work they did and culture and structure of the organization are also reasons of dissatisfaction as their rate is low as compared to the above two variables.

Furthermore, analysis was made to determine the main factors that affect knowledge sharing in organizations in general and MIE in particular. And, the factors are related to:

- Information technology infrastructures
- Personal benefits
- Management problems
- Individual attitudes
- Individual willingness
- Interaction and communication skills and
- Knowledge storage mechanisms.

Analysis was also made to identify which knowledge sharing model the organization uses and how organizations in general can encourage knowledge sharing behaviors among their employees. The result shows that there is no knowledge sharing model in the organization. But organizations can encourage knowledge sharing through availability of technology that is used for knowledge sharing in the organization, regular emphasis by the top management of the organization, linking KS with the performance evaluation of the employees. In addition, most of the respondents feel that the organization need to provide reward such as non- monetary and monetary for those who contribute knowledge to the organization. Furthermore, existence of designated knowledge officer in the organization also encourages knowledge sharing among employees.

6.2 Conclusion

Individuals are the knowledge creators and the produced knowledge should be translated into organizational knowledge. This requires effective knowledge sharing.

Based on the study results and summary, it could be concluded that the IT infrastructures, personal benefits, management problems, individual attitudes, individual willingness, interaction and communication skills and knowledge storage mechanisms are the significant variables that affect employees knowledge sharing in organizations in general and the organization under study in particular.

Availability of knowledge sharing model is also a very important factor for effective knowledge sharing. Hence, the study proposes two knowledge sharing models for proper implementation of knowledge sharing among employees within the organization. These are personalization versus codification and individualization versus institutionalization.

Usage of different portfolio of knowledge sharing model is important for organizations with different size, geographical dispersion and job nature, because each model has its own advantages and limitations. Therefore, the limitation of one model will be eliminated by the other model. So, integrating the two models is very important for the enhancement of knowledge sharing behavior of employees in the organization.

6.3 Recommendations

Based on this research, KS should be continuously promoted and barriers should be overcome.

The strategies for promoting knowledge sharing may be company-specific. However, a strong support was found for linking knowledge sharing with rewards and performance appraisal.

Support from the top management in encouraging employees to publish and disseminate knowledge via various available methods is strongly recommended.

More efforts must be made and awareness must be created and the existing culture of both the individual employees and the organization should be changed to ensure that people understand the benefits of knowledge sharing.

Organizations should encourage knowledge sharing by providing access to information technology infrastructures that are used for knowledge sharing.

The company should set time for knowledge sharing as one part of rules and regulations of the organization.

The company should arrange a formal knowledge sharing opportunity like regular meeting, seminar and workshop where colleague can share knowledge.

The company should provide continuous training on knowledge sharing practices among employees within, outside and international organizations.

The company should provide continuous training that improves the employees communication skills.

For effective knowledge sharing there is a need to design knowledge management system such as portal that encompasses knowledge creation, knowledge representation, knowledge storing and knowledge sharing.

The organization should establish teams or groups that are aligned with rewards for the best performer and provide them a position to share their creativity for others.

The organization should implement the proposed models, since it fosters knowledge sharing among individuals on the organization.

Since knowledge sharing is vital for organizations survival further studies should be conducted on other industries such as cement and textile etc.

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Annex

Annex I: Questionnaire

Part 1: Demographic profile of the respondent

Answer the following questions by putting the (√) symbol on the following boxes or write in the space provided.

1. Specify your gender?

   □ Male □ Female

2. Your age?

   □ 25–34 □ 35–44 □ 45–54 □ 55–64

   Others _____

3. Your educational level?

   □ Diploma □ Master's Degree

   □ Bachelor's Degree □ PhD (Doctorate Degree)

   Others _____

4. Working experience in the organization?

   □ < 5 □ 5-9 □ 10-14 □ 15-19 □ > 20

   Others _____

5. Working department?

   □ Design and technology center □ Electrical works maintenance

   □ Mechanical works department □ Project construction department

   □ Planning and monitoring department □ Manufacturing department

   □ ICT department □ Finance department

□ Supply department

6. At the start of your employment, how did you become familiar with your job?

   □ Via training only □ Training + Documented materials

   □ Via documented materials only □ Via self study

   Others _____

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

   □ ≤ 3 months □ 6 months □ 1 year □ ≥ 2 years

   Others _____

8. Are you satisfied with the current job?

   □ Yes □ No

9. If your answer to question number 8 is "No", which one of the following is the main cause for dissatisfaction?

Reasons of dissatisfaction **Please indicate the extent to which you agree or disagree with the following statements by putting a tick (√) mark in the appropriate box.**		**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
1	Inadequate or no opportunity for further education and training					
2	Inadequate salary					
3	Lack of reward and recognition for the work you did					
4	Culture and structure of the organization					

Part 2: Knowledge sharing constructs

	KNOWLEDGE SHARING VIEWS **Please indicate the extent to which you agree or disagree with the following statements by putting a tick (√) mark in the appropriate box.**	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
10	It is my pleasure to share my know-how, information, working experience and knowledge to my colleagues voluntarily.					
12	It is my pleasure to share freely information and knowledge that improves the organizations performance.					
13	I share my working experience and knowledge to all my colleagues.					
14	My colleagues are willing to share information with other colleagues all the time.					
15	I share my working experience and knowledge to my colleagues conditionally.					
16	My colleagues share working experience and knowledge conditionally.					
17	I communicate with my colleagues in teams or groups for sharing information and knowledge.					
18	I share information and knowledge within the group if I know the information/knowledge is helpful in the understanding of other members of the group.					
19	I discuss organizational problems with colleagues rather than straggling with the problems individually.					
21	Sharing knowledge with colleagues is important for my job.					
22	In my first entry I received knowledge from					

	colleagues in my own department.					
23	There is knowledge sharing culture in my organization.					
FACTORS OF KNOWLEDGE SHARING **Please indicate the extent to which you agree or disagree with the following statements by putting a tick (√) mark in the appropriate box.**		**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
24	There is lack of rewards and recognition systems that would motivate people to share their knowledge.					
25	There is lack of time to share knowledge.					
26	There is lack of formal and informal activities to cultivate knowledge sharing in my organization.					
27	The existing organizational culture does not provide sufficient support for sharing knowledge.					
28	There is lack of interaction between those who need knowledge and those who can provide knowledge.					
29	There is no system to identify the colleagues with whom I need to share my knowledge.					
30	Retention of highly skilled and experienced staff is not a high priority in my organization.					
31	Physical work environment and layout of work areas restrict effective knowledge sharing in my workplace.					
32	There is a general lack of trust among colleagues in my organization.					
33	An employee does not share knowledge because of the fear of it being misused by taking unjust credit for it.					
34	It is difficult to convince colleagues on the value and the benefits of the knowledge that					

	I may possess.					
35	Employees in my organization do not share knowledge because they think knowledge is power.					
36	Employees in my organization do not share the knowledge because of poor verbal/written communication and interpersonal skills.					
INFORMATION TECHNOLOGY INFRASTRUCTURE CONSTRUCTS **Please indicate the extent to which you agree or disagree with the following statements by putting a tick (√) mark in the appropriate box.**		**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
37	IT systems and processes are in place in my organization to share knowledge.					
38	I use the internet, e-mail and electronic bulletin boards to share my knowledge.					
39	I use the organizations intranet to share my knowledge with colleagues.					
40	There is portal which is used to share knowledge among colleagues in my organization.					
41	My organization has user-friendly information technology systems which are used for knowledge sharing.					
42	I always store my knowledge and work experience in the organization's database, portal or intranet.					
43	I always put/store my knowledge and work experiences in manual papers.					

REASONS OF WHY YOU SHARE KNOWLEDGE **Please indicate the extent to which you agree or disagree with the following statements by putting a tick (√) mark in the appropriate box.**		**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
44	I share knowledge because I like it.					
45	I share knowledge because I find it personally satisfying.					
46	I share knowledge because I feel proud of myself.					
47	I share knowledge because I want my superior to think I am a good employee.					
48	I share knowledge because I want my colleagues to think I am competent.					
49	I share knowledge because I want my supervisors to praise me.					
50	I share knowledge because I want my colleagues to praise me.					
51	I share knowledge because I might get a reward.					
52	I share knowledge because it may help me get promoted.					
KNOWLEDGE SHARING MODEL CONSTRUCTS **Please indicate the extent to which you agree or disagree with the following statements by putting a tick (√) mark in the appropriate box.**		**Strongly Agree**	**Agree**	**Neural**	**Disagree**	**Strongly Disagree**
53	Knowledge is carefully codified and stored in databases and documents, where it can be accessed and used easily by employees in the organization.					
54	Knowledge is closely tied to the person who developed it and employees shared mainly					

	through direct person-to-person contacts (meeting, etc).					
55	Knowledge is shared informally at individual level.					
56	The organization provides information formally to all employees about how things are done in their department.					
ENCOURAGEMENT OF KNOWLEDGE SHARING **Please indicate the extent to which you agree or disagree with the following statements by putting a tick (√) mark in the appropriate box.**		**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
57	Knowledge sharing can become a culture in the organization if top management regularly displays and reinforces the theme that knowledge is the lifeblood of an organization.					
58	Technology plays a significant role in promoting Knowledge Sharing.					
59	The organization should encourage the employees to publish their knowledge on the organization's database/website or other manual papers that others could access it.					
60	Knowledge sharing can be encouraged if it is linked with the performance evaluation of the employees.					
61	Knowledge sharing can be encouraged if it is clearly linked with rewards.					
62	Non-monetary rewards (such as appreciation, recognition) shall be more effective in encouraging knowledge sharing than monetary (financial or economic) rewards.					
63	Knowledge sharing can be encouraged if					

	there is a designated knowledge officer in the organization.					

64. Comments

_____
_____
_____
_____
_____

Annex II: Interview Questions

1. Do you have know how about knowledge sharing?
2. What do you think about the importance of knowledge sharing among employees?
3. Does your organization support the culture of knowledge sharing?
4. How do the new employees become familiar with the organization's job?
5. Is there any knowledge sharing mechanism that the employees use to share their knowledge among each other?
6. Is there any motivational scheme for the employees that share knowledge with their colleagues?
7. Is there any reward and recognition to those who contribute their knowledge for the organization's performance?
8. How do you see employee turnover in the organization?
9. How do you explain the availability of information technology infrastructure or communication tools in the organization?
10. What is the structure of the organization; organic (structures which are relatively flexible and adoptable for turbulent and high-changing environment and emphasize on parallel relations rather than vertical ones), mechanic (structures which are recognized by traits such as high complexity and formality as well as centralization)?
11. What are the possible factors that affect knowledge sharing in the organization; from individual perspective, organizational perspective or technology?
12. What actions should the organization take to improve knowledge sharing among its employees?

Annex III: The Researcher's Observation Checklists

1. Department Name_____
2. The types of work performed

   _____
   _____
   _____
   _____
   _____
   _____

3. Availability programs/ schedule and places for discussion or meeting on current issues.

   Yes No

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

   Yes No

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

   Yes No

6. Availability of knowledge artifacts such as:

   Printed as well as electronic materials; Yes No

   Magazines; Yes No

   Brochures; Yes No

Annex IV: Covering Letter Accompanying Questionnaire

Dear Respondent,

I am a post-graduate student in the School of Information Science at Addis Ababa University, currently working on a thesis research on the topic “Knowledge Sharing among Employees of Mesfin Industrial Engineering” in partial fulfillment of the requirements for the Master’s degree.

The purpose of this self-administered questionnaire is to collect data from employees of MIE, in order to investigate the knowledge sharing behaviors among employees so as to identify the factors that affect knowledge sharing, propose, among other things, appropriate models of knowledge sharing mechanisms to enhance knowledge sharing among employees.

Your responses will not be identified with you personally, nor will anyone be able to determine which unit of the organization you work for. All responses that you provide will be treated confidentially.

I would, therefore, like to requests you to fill this questionnaire carefully. The information that you provide me through the questionnaire would be of paramount importance to the project I am undertaking.

Thank you in advance for taking some of your precious time in completing the questionnaire.

Sincerely,

Hareya G/slassie

School of Information Science

Addis Ababa University

Annex V: Declaration

I declare that the thesis is my original work and has not been presented for a degree in any other university.

_____

Date

This thesis has been submitted for examination with my approval as university advisor.

_____

Advisor