CHAPTER 2

Theoretical background of the study

2.1 What is knowledge?
2.2 Significance of knowledge sharing
2.3 Principles and process of KM
2.4 Implementation of knowledge management
2.5 Knowledge enablers
2.6 Knowledge management process
2.7 KM and organization’s performance
2.1 What is Knowledge?

Knowledge is not a fresh concept, from very early times people have communicated knowledge from one generation to next, in the form of songs, stories, narrations, skills, and so on. Knowledge enriches as we share; it never gets depleted like other resources. Knowledge is playing key differentiator role in today's scenario, which is embarking a new era as compared to a period where labor and capital ruled.

Even though the knowledge is derived from information, it represents more meaningful and accurate piece of information. It includes acquaintanceship, prudence, and cognizance gained through professional study, making comparisons, identifying relevance and making associations with other activities. Organizations think, knowledge is an applied action.

Evolution of human has always accompanied by knowledge growth; there are many significant witnesses available to prove knowledge development. Therefore, the knowledge growth and concept is not new, but the new thing is the quantity and its impact on current economic, social and cultural rights, and to the modern man’s life. Information and knowledge have become an important resource of the economic resources. These have become the new strategic resource in the economic life which adds the natural resources and the appearance of what is called as the "knowledge economy."

In a traditional economy, the resources are limited and are depleted, whereas in a knowledge economy the resources are not confined but in higher quantity. In a traditional economy, more than fifty percent of the workers were involved in the physical movements, who were known as regular workers. The workers in the traditional economy have now given way to knowledge workers, who have a distinct approach towards their work. The knowledge workers require collaboration, sharing of knowledge and proficient than their predecessors.

Managing knowledge has become one of the crucial factor in the global economy, which effectively has become a source of competitive advantage. Companies follow approaches that integrate various processes of knowledge management, such as identification,
management, sharing and capitalization on the know-how, experience and intellectual capital of organizational employees. Much of the knowledge is available in tacit form; as a result, knowledge is lost when the employees leave an organization.

![Knowledge hierarchy system model](image)

**Figure 1.2: Knowledge hierarchy system model**

The knowledge hierarchy system model is shown in figure 1.2. Knowledge is commonly renowned from data and the information. Data includes observations or facts. Information is classified, cleaned, processed and verified data. Knowledge leads to plans for decision making, achieved by meaningfully combining information with practice. Knowledge capture minimizes the duplication of work, enables problem-solving, promotes teamwork, brings innovation and ideas, increased client satisfaction, and high employee motivation. The wisdom is an extension of knowledge which results in effective actions and skill set generation (Nonaka I., 1994).

The twelve important principles of Knowledge are: Knowledge is connected by nature; Knowledge is self-organizing; Knowledge is a group driven entity; Knowledge requires language to transfer; Knowledge could be made available in multiple forms; Knowledge is casual; Knowledge is dynamic; Knowledge has a lifespan; Knowledge is not proprietary; Knowledge would not grow in conducive environment; No single best practice for Knowledge; and Knowledge is a vital link to management.
2.2 Significance of Knowledge Sharing

David Delong’s, (2012), writes in his book entitled *Lost Knowledge* that, “knowledge enables effective actions and supports decision-making without deviating from the context of organizational activity.” The organizational performance most of the time depends on effective use of knowledge assets. The organizations had to analyze the influence of knowledge loss on organizational creativity; this can be achieved by identifying the key people and locale where knowledge resides. The identified knowledge is to be transferred to the intended points of knowledge seeking.

Five values of knowledge sharing are: knowledge is an intangible product; knowledge sharing is an important enabler to promote competitive advantage; knowledge sharing is an important process to hold knowledge loss due to employee turnover; it is a tool to leverage the expertise and experiences of workers; and knowledge sharing is influenced by swift changes in technology, type of business and societal need (Gurteen, 1999).

Sheng, (2010) opinioned that individual’s technical knowledge can be acquired by various means, including organizational vision, departmental mission, individual and organizational goals, plans, personal experiences and attitudes, social networking and others. Various techniques ranging from formal and informal interviews, mind mapping to blogs and WiKis, socialization, externalization and others are used.

Knowledge capturing involves following steps; 1. Identify the knowledge seeking entity 2. Identify community to practice knowledge 3. Bring out the clarity in captured knowledge 4. Create guidelines on the relevance of knowledge 5. Validate the Guidelines 6. Generate the knowledge 7. Classifying the knowledge into levels, priorities, lessons, and practices, and 8. Publish the knowledge (Kitimaporn, 2012).

SMEs face several challenges during knowledge capturing process. Most of the knowledge in SMEs is tacit in nature, usually held by senior employees. The tacit knowledge is not easily transferable to others, and there is a threat of losing this knowledge when key people leave the organizations. Some of the issues pertaining to knowledge capturing in SMEs are: Knowledge transfer needs mutual trust, but the Asians
usually do not trust each other and enter into unhealthy competitions (Norizzati, 2009; Chowdhury, 2006). Many people have the wrong notion that if they share knowledge openly they may lose out their intellectual. Organizations are embarking on a variety of technologies from personal computing to mobile computing which will augment the process of knowledge capturing (Kitimaporn, 2012; Mike et al. 2003; Anand & M.D. Singh, 2011) identified from the study that in Indian SMEs no uniform standards are practiced in IT and poor organizational investments in IT resources. It is also essential to take care that, the knowledge capturing from a project should not collide with the project management plan, and the knowledge capturing process should balance between the tacit and the explicit knowledge. The selected knowledge codification must lead to efficient knowledge dissemination.

The knowledge management study has roots in many areas such as business, management, sociology, and economics, etc. Knowledge management in early 70’s, 80’s, and 90’s and later has the following significant contributions.

The early 70's:

- A significant contribution by management theorists Peter Drucker, Paul Strassmann, Peter Senge, and others to promote knowledge management.
- Increased importance of information and explicit knowledge as organizational resources.
- Organizations have begun transforming into a learning organization.

The early 80's:

- Knowledge is viewed as a competitive asset
- Artificial intelligence is used as a tool to manage knowledge.
- Increased publications of knowledge management articles in journals and books
90’s and Later:

- Management consultancy firms started in-house knowledge management programs.
- The works by Nonaka’s and Hirotaka Takeuchi’s in the popular press gave great publicity to this concept.
- Knowledge management has opened up a major area of international consultancy, and the firms such as Ernst & Young, Arthur Andersen, and Booz-Allen Hamilton have reaped the benefit.

2.3 Principles and Process of Knowledge Management

- Right knowledge needs to be captured from right places at a right time.
- Essential dimensions of knowledge are tacit and explicit (Polanyi M., 1958).
  1. According to Nonaka, (1994) most of the tacit knowledge is cognition related, includes mental maps, beliefs, views, etc. Nonaka, (1991) also states that since tacit knowledge is personal in nature, it is difficult to extract. As Sanchez and Ron, (2001) comment learning in an organization happens when individuals come together and share their ideas with an intention of developing new knowledge.
  2. The explicit knowledge can be codified and communicated in some form (Alavi, M. & Leidner, D.E. 1999). Explicit knowledge is usually documented using manuals, publications, lessons, emails, databases, business records, and so on (Koenig, M.E.D. & Srikantaiah, T.K., 2000). Explicit knowledge is available either in structured form or in unstructured form. The unstructured form includes teachings, audio and video materials, images, etc. Information systems include intranets and the internet which can be effectively used to distribute the explicit knowledge.
among people working inside the company or networked companies (Sanchez & Ron, 1997).

➢ Types of knowledge: old and new

• Making better use of available knowledge solves the problem of recreating the existing knowledge. The concern is developing mechanisms to access the available knowledge. The knowledge auditing is used as a tool in this scenario.

• Creating new knowledge requires additional training, external consultancy, workshops, etc. The new knowledge leads to innovation, innovation leads to actions and facilitates decision making. It is the challenge for every individual to protect their creative ideas and to allow them be used whenever they are required (Caroline De Brún, 2005).

➢ Collecting and connecting

• The collecting explores different ways of information communication among people. The role of information and communication technologies is significant in knowledge collection. The comprehensive collection of knowledge needs skilled interpretation and mapping to the local context.

• Various knowledge repositories can be connected using socialization, directories, collaborative working, community practices, and so on. The connection promotes people interaction and enhances the flow of tacit knowledge from who possess to whom in need.

➢ People, processes, and technology

• People: Knowledge management is a people-centric by nature. There are many questions need to be answered: Does the organization culture reinforce knowledge sharing? Are employees are rewarded for creating, sharing and using knowledge? Is your organization respects “knowledge is
power”? Are your employees reluctant to share? Is there sufficient time for knowledge-seeking? Are they learning from mistakes, or simply “blame and shame” culture?

- Processes: To improve knowledge sharing, organizations should align their internal processes suitably. Which processes account for knowledge barrier or knowledge enablers? What methods can be brought in to support creativity in people?

- Technology: Technology is an essential enabler for knowledge management; it connects people with information and individuals (Caroline De Brún, 2005).

**Ten Principles of Knowledge Management**

1. Knowledge management is expensive: Companies who practice knowledge management spend an average of 5% to 10% of their income on the KM.

2. Efficient management of knowledge requires hybrid solutions involving both people and technology. Managing practical knowledge is a labor-intensive work; we need to construct a hybrid environment which will make use of a good blend of humans and machines.

3. Knowledge management is highly political: If knowledge is connected with power, money, and success. Then politics plays a role while lobbying on behalf of knowledge and build opinion-leaders.

4. Knowledge management requires knowledge managers: The responsibility includes the creation, distribution, and application of knowledge in the organization.

5. Maps were preferred over models in knowledge management: It makes the understanding easy and yield better results.

6. Sharing and using knowledge are repeatedly unnatural acts: There is an amount of risk-taking in the process of knowledge sharing and using the shared knowledge in their work.
The Lotus Development Corporation, a division of I.B.M., has 25% of the total performance evaluation based on knowledge sharing. Buckman Laboratories recognizes its top 100 knowledge sharers with an annual conference. ABB (ASEA Brown Boveri) Ltd., the Swiss-Swedish conglomerate, evaluates managers not only on the basis of their decisions but also on the application of knowledge and information in the decision-making process.

7. Knowledge management enables knowledge work processes: The critical business processes which are enabled by knowledge management includes market research, product design, and development, configuration and pricing.

8. Knowledge management brings active involvement of employees, and the learning outcome should be summarized and reported to others.

9. Knowledge management is a never-ending process. Since knowledge changes with time, companies change their strategies, structures, product and services. The need for new knowledge arises from both management and professionals.

10. Knowledge management requires a knowledge contract in terms of ownership.

2.4 Implementation of Knowledge Management

The ten steps to implement knowledge management are shown in figure 2.1.

![Knowledge management steps diagram]

Figure 2.1: Knowledge management steps
i. Analyze the existing infrastructure: It is the stage in which an organization makes an effort to understand the required components to formulate the KM strategy and technology framework. They try to identify what is already practicing in the company and the critical gaps in the existing infrastructure.

ii. Align knowledge management and business: In this step, the organization tries to make the connection between business strategy and knowledge management. The design of the company plan is pulled down to the level of system design.

iii. Design the knowledge management infrastructure: This step is towards deploying the KM components to create the KM system architecture. The collaborative platform which best suits the company requirements will be selected. The platform has various layers of intelligence-driven by different types of technologies.

iv. Knowledge audit and analysis: The analysis of critical and weak knowledge assets is done.

v. Designing knowledge management team: Organization has to form the KM team which will design, build, implement, and deploy company’s KM system. To develop an effective KM team, the organization identifies sources of expertise, which makes use of the system successfully balancing the technical and managerial requirements.

vi. Creating knowledge management system blueprint: The KM team builds a design that provides a detailed plan for building and improving the KM system.

vii. Developing a knowledge management system: Once KM blueprint for developing the KM system is ready, the development of the system follows.

viii. Testing the prototype as a part of the pilot project: Implementing the actual needs of its users is the ultimate goal of the KM system. It is the responsibility of the KM team to find out these needs, and the pilot deployment is the final reality check.
ix. Leadership and reward structures: Reward and incentive schemes are essential to encourage and gain required support from employees to make use of the system and contribute towards the organization. Above all, it requires enthusiastic leadership.

x. Real options analysis for knowledge management: This stage is to finalize the appropriate metrics for effective analysis and arriving at a robust composite mechanism.

2.5 Knowledge Enablers

Knowledge enablers are defined as “an organization mechanisms which are identified consistently and consciously to develop knowledge within the organization”. Several researchers are of the opinion that identifying knowledge enablers is an essential prerequisite for knowledge creation process. There is also another school of thought that, knowledge enablers are the influencing factors to stimulate knowledge consistently through the firm (Lee & Choi, 2003; Ichijo, K.G., et al. 1998, Grotenhuis, F.D.J. and M.P. Weggeman, 2002). Based on the literature review on Knowledge enablers some of the commonly used knowledge enablers identified are; Organizational Culture, Organizational Structure, Technology including IT, People, and Skills. The following table illustrates the list of knowledge enablers used by various studies while working on the knowledge management in SMEs.

**Table 2.1: List of knowledge enablers used by various studies**

<table>
<thead>
<tr>
<th>Research study by</th>
<th>Knowledge enablers used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arthur Anderrson And APQC (1996)</td>
<td>Leadership, organizational culture, technology, and measurement.</td>
</tr>
<tr>
<td>Authors</td>
<td>Contributions and Influences</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Davenport, T. &amp; Klahr, P., (1998)</td>
<td>A clear purpose and language, a standard and flexible knowledge structure, multiple channels for knowledge transfer, organizational culture, technical and organizational infrastructure, change in motivational practices, and senior management support.</td>
</tr>
<tr>
<td>Liebowitz, J., &amp; Wilcox, L.C. (1997)</td>
<td>Strategy with the support of senior management, CKO or equivalent and KM infrastructure, knowledge ontologies and repositories, KM systems and tools, incentives to encourage knowledge sharing, and supportive culture.</td>
</tr>
</tbody>
</table>
### 2.6 Knowledge Management Process

These are the organizational mechanisms to create, store, organize, share and apply knowledge for the well-being of the whole organization. Alavi, M., & Leidner, D., (2001), propose that KM process has the Knowledge Creation, Storage, Retrieval, Transfer, and Application phases. Alryalat, H., & Alhawari, S., (2008) propose that KM process should include three phases, namely, process to capture knowledge phase; process to create knowledge phase, and process for knowledge application phase. The first phase focuses more on techniques to identify and capture the needed knowledge to solve specific problems that have occurred. The second phase considers creating new knowledge in the organization as its major priority. The third phase is to build processes that will make use of knowledge, as a part of products, services, and processes which yield in attaining high standards of improvement and progress.

According to Lai, H., et al. (2000), there are four phases in the knowledge management process: 1. Knowledge acquisition which includes knowledge refinement, 2. Knowledge coordination and induction with knowledge re-illustration, 3. Knowledge transmission and diffusion, and 4. Fresh knowledge is generated using both the human intellect and existing knowledge.

Bouthillier, F., & Shearer, K., (2002) propose a knowledge management process which has Discovery phase, Acquisition phase, Creation phase, Storage, and Organization phase of the knowledge. The discovery is used to source the various knowledge resources, acquisition is to acquire knowledge from outside sources, creation step includes the
creation of new knowledge from reliable sources by using a combination of knowledge acquired internally and sourced from external world, and finally the success of the KM cycle was indicated by demonstrating the application of knowledge.

Lai, H., & Chu, T. H., (2000), segregates the KM framework into six stages: Initiation stage, Generation stage, Modeling stage, Repository stage, Distribution and Transfer stage, Usage stage and finally retrospect stage. The initiation stage deals with fathom of various requirements for knowledge management. The generation stage concerned with the availability of old knowledge in the organization, and who is the owner or contributor? and also to identify the thought leader. The modeling stage is used to justify the produced knowledge. In the repository stage, the explicit knowledge is stored for ease of sharing. Distribution and transferring stage reach the knowledge to individuals. The knowledge use deals with developing the knowledge development as an asset finally, retrospect stage deals with evaluating the process followed.

Stollberg Michael., et al. (2004), proposes the KM process with seven activities. It starts with knowledge identification which lists various attributes of the required knowledge. Knowledge acquisition concentrates on discovering the necessary methods such as buying, consulting, researching and development and self-creation. Knowledge preparation focuses on information presentation. Knowledge use affirms usability of knowledge among individuals. Lastly, knowledge maintenance assures the KM system prevalent.

Deng Qianwang., & Yu Dejie., (2006), propose a KM process which has steps for identification, capturing, selection, storage, and serving. The process starts with enterprise-level knowledge identification. The identified knowledge is captured and collected in a digitized form for system processing. The knowledge selection evaluates the relevance of knowledge, value attached and accuracy before storing it in the repository. Next, the knowledge archives are created and stored in the repository. Finally, the knowledge manager serves it to knowledge seekers.
Peachey, T. & Hall, D., (2005), describe a KM process in five phases. Enumerating different methods for generating new knowledge is the focus of knowledge creation process. Data mining and learning tools are used in knowledge storage and retrieval phase, which are part of organization memory facilities. Knowledge transfer deals with the knowledge relocation among individuals, from individuals to sources and between groups and organizations. Knowledge application phase advocates amalgamating the knowledge into organizational practices using technology. Finally, knowledge roles and skills illustrate the importance of roles and competencies for capturing, distributing and using knowledge.

Socialization-Externalization-Combination-Internalization (SECI) model by Nonaka, I. (1995) is used in the current study for implementing a knowledge management process in SMEs. The SECI model proposed four ways to combine and convert knowledge types, showing how knowledge can be shared and created in organizations. The SECI model makes use of explicit and tacit type of knowledge representations. The highlights of the various processes in SECI are listed below.

**Socialization:**

- Tacit-to-tacit knowledge transfer is allowed.
- Practice, guidance, imitation and observations are used for knowledge transfer.
- New learner learns a new skill from an experienced person.
- A common methodology is to ask questions and observe.
- Socialization promotes natural and easiest form of knowledge exchange.
- The effectiveness of one’s expressions and experiences decides the quality of knowledge that is transferred to others.

**Externalization:**

- Implements tacit-to-explicit knowledge transfer.
- Externalization quantifies confined understanding based on documents and manuals.
- Promotes the easy flow of knowledge throughout the organization.
- It is suitable for distributing knowledge for repetitive work or processes.
- Articulating the tacit knowledge is the challenge to managers and CIOs.

**Combination:**

- The combination transforms explicit knowledge available in one form to another form.
- Different types of explicit knowledge that complement each other would be more effective when combined.

**Internalization:**

- Tacit-to-explicit knowledge transformation.
- Books, manuals or the web are main sources.
- Individual needs drive Internalization.
- If an employee needs to carry out tasks that are unfamiliar, internalization can be a driver towards creating 'new' knowledge for individuals.

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**Figure 2.2: Spiral movement of knowledge**
This SECI model employs the spiral movement of knowledge as shown in figure 2.2. It involves continuous interactions between the explicit and tacit knowledge. The process followed in the SECI model creates a good amount of new knowledge. The model also motivates individuals to share their inherent knowledge, during the process of creating a new knowledge.

The following table gives a summary of various KM processes used in some of the other research studies on knowledge management.

**Table 2.2: List of KM process used by various studies**

<table>
<thead>
<tr>
<th>Research study by</th>
<th>KM Processes used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beckett et al. (2000)</td>
<td>Acquisition, retention, and exploitation.</td>
</tr>
<tr>
<td>Benbya et al. (2004), Chen &amp; Chen (2005)</td>
<td></td>
</tr>
<tr>
<td>Chakravarthy et al. (2003)</td>
<td>Knowledge protection, knowledge leverage and knowledge accumulation.</td>
</tr>
<tr>
<td></td>
<td>Knowledge Application, and Knowledge Protection.</td>
</tr>
<tr>
<td>Hassanali A., Mahmood Y., &amp; Seyed A. H. (2011)</td>
<td>Socialization, Externalization, Combination and Internalization.(SECI model)</td>
</tr>
<tr>
<td>Davood Gharakhani, &amp; Morteza Mousakhani, (2012)</td>
<td>Knowledge acquisition, knowledge sharing, and knowledge application.</td>
</tr>
</tbody>
</table>
2.7 KM and Organization’s Performance

The speed at which the knowledge-based skills are developed is an important indicator to measure the performance and the survival of any organization (Lupu, 2009). The knowledge and the intellectual capital are considered as the enterprise-based skills. Knowledge management works as an essential tool for sustaining competitive advantage and improving performance. The evaluation of KM performance provides a yardstick for determining the competitiveness of an organization. From literature survey the knowledge performance indicators identified are; Innovativeness, Productivity, Competitiveness, Performance cost, Return on Investment, Customer satisfaction, Sales Growth, Market Share, Efficiency & Effectiveness, Profitability & Growth rate, and so on. The following table summarizes some of the performance metrics used to measure the effective implementation of the knowledge management in SMEs.

**Table 2.3: List of performance metrics used by various studies**

<table>
<thead>
<tr>
<th>Research study by</th>
<th>Performance Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Tan Thai Soon &amp; Dr. Fakhrul Anwar Zainol (2011)</td>
<td>Financial measures, intellectual capital, tangible and intangible benefits, and balanced scorecard.</td>
</tr>
<tr>
<td>Apaydin F. (2011)</td>
<td>Return on investment, increase in sales, and overall performance evaluation.</td>
</tr>
<tr>
<td>Davis, P. S. et al. (2010)</td>
<td>Market share growth and sales (growth over the past three years).</td>
</tr>
<tr>
<td>Armario J. M. et al. (2008)</td>
<td>Ratio of export sales to total sales, export sales growth,</td>
</tr>
</tbody>
</table>
the percentage of net profits obtained in the firm’s export sales, the growth of export sales net profits.

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Li, Y. et al. (2008)</td>
<td>Return on investment, profits, and market shares (compared with competitors).</td>
</tr>
<tr>
<td>Demirbag, M. et al. (2006)</td>
<td>Eleven financial and nonfinancial measures (e.g. revenue growth over the last three years, net profits, return on assets).</td>
</tr>
<tr>
<td>Kara, A. et al. (2005)</td>
<td>Sales, revenue growth, market share, return on investment.</td>
</tr>
</tbody>
</table>

Knowledge is a crucial source for people, firms, and countries. Managing knowledge and intellectual capital create a new basis for competitive advantage. The performance of the organization can enhance or decline depending on how well they create, capture, and leverage their knowledge in the organization. The intellectual capital is defined as the knowledge that is of value to the organization. The elements of the intellectual capital are human, structural, and customer/Relational capital (external). The organization that can manage knowledge efficiently creates intellectual capital (Davies, J. & Waddington, A., 1999).
**Human capital**

Human capital is the knowledge, skill and competence of individual employees providing solutions to customers (Bassi, 1997). Increasing the capacity of every worker results in an increase in intellectual capital. Workers are the main contributors to create knowledge, new ideas, and new products, and how they think about and do work in the organization.

**Structural Capital**

The structural capital consists of a broad range of patents, models, concepts, computer and administrative systems. It is the organizational capabilities to meet market requirements and supports. Employee's intellect can be used to its fullest potential if there are suitable organizational systems and procedures. Any negligence could lead to a loss in the overall intellectual capital (Bontis, 1996).

Following four elements forms structural capital of a firm:

1. *Systems* – deals with the way in which information processing, communication, and decision-making is done in an organization and progress achieved in attaining the required output progress.

2. *Structure* – deals with the responsibilities distribution among employees and accountability of work done.

3. *Strategy* – deals with the methodology set to achieve goals of the organization.

4. *Culture* – deals with individual opinions, mindsets, professional ethics, values, and norms.

**Customer/Relational capital (External Capital)**

Customer capital is also named as relational capital is an external capital. It includes various market channels, Customer relationship management issues, industry networking and a good understanding of the impact of government rules and public policies.