Chapter 1

Introduction
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1.1 Knowledge Management and Organizational Competencies: An Overview

Knowledge is spread everywhere, from the deep crevices of human brain to paper documents and electronic/magnetic media like disks. Every medium has a different way to codify and express knowledge. The economies have been continuously evolving over the past sixty years and that even at a rapid pace in the last two decades. Intellectuals, scholars and think-tanks from disciplines as diverse as Economics, Information Technology and Management Science generally agree that knowledge has been the pivot of this transformation.

Knowledge Management is one umbrella which unifies knowledge collected from all the different media sources, and creates a system or network between the two main resources, the humans and the available technology. It is a scientific process that initiates its working by amassing knowledge (both tacit and explicit), filtering it, structuring or restructuring it, storing and finally disseminating it. The dissemination process of the already stored knowledge is again very crucial, as it should also be in such a manner that

- The access to knowledge is timely, accurate and easy.
- The accessed knowledge aids adequately in decision making, and
- The available knowledge facilitates in creation or generation of new knowledge.

In order to manage this intellectual asset, that every organization possesses, there is a dire need for managing the organizational competencies also, in the
most optimized manner. Knowledge management and organizational competencies in a way harmonize each other. The better managed is the knowledge, the higher goes the graph for the efficient deployment of organizational competencies. Similarly, better employment of organizational competencies rewards the organization in effective knowledge management, thus resulting in fruitful decision making.

Knowledge management strategies are construed and endorsed by individuals in diverse organizations through individual competencies only. Competencies act like a bridge to connect the job requirements with the desired skill set (of an individual) through appropriate training, development and further research. Organizational goals are fulfilled and strategies are implemented satisfactorily through sharpening of competencies by way of using advanced knowledge management tools & techniques.

1.2 The Knowledge Revolution

The key factor for one’s psychological, social and economic progress is knowledge. The cross-fertilization of thought process in terms of knowledge, forms the base for valuable diverse innovations, and thus gives rise to a flourishing society.

Chichilnisky, G. (1998), argues that today’s society is on the threshold of a truly revolutionary era of discovery - ranging from the origins of the universe to new states of matter and microscopic machines, from a new understanding of the oceans and of the biological connections across the Earth's species to the functioning of the human brain and the origins of consciousness.

We are undergoing a social and economic revolution which matches the impact of the agricultural and industrial revolutions. This is a ‘knowledge revolution’ driven by knowledge and by the technologies for processing and communicating it.
As per Utz, A. (2006), the knowledge revolution is creating a constant state of restructuring at the global, country, community, and organization levels. While this raises tremendous possibilities for enhancing growth and competitiveness, it also carries risks that countries, organizations, and individuals will not keep up with the rapid changes. Consequently, their competitiveness depends more than ever on their ability to access, adapt, and utilize knowledge for development.

Knowledge revolution has created new opportunities and possibilities for the access and use of knowledge and information. To capitalize on the knowledge revolution to improve their competitiveness and welfare, individuals, organizations, communities and countries need to build on their strengths and carefully plan appropriate investments in human capital, effective institutions, relevant technologies, and innovative and competitive enterprises.

Though the increased importance of knowledge provides great potential for individuals, organization, societies, and countries to strengthen their economic and social development by providing more efficient ways of producing goods and services and delivering them more effectively and at lower costs to a greater number of people, it also raises the danger of a growing *knowledge divide* (rather than just a *digital divide*) among those who are generating most of this knowledge and those who are failing to tap the vast and growing stock of knowledge because of their limited awareness, poor economic incentive regimes, and weak institutions.

Combined with trade policy liberalization, the knowledge revolution is leading to greater globalization and increased international competition, which is eroding the natural resource and low labour cost advantage of most developing countries.
1.3 The Knowledge Hierarchy

Information science swirls mainly on four basic building blocks, namely, data, information, knowledge and wisdom. Though they are closely related, yet they differ in meaning and perception. These can be considered as different levels of abstraction. The success or the failure rate of an organization depends mainly on how it describes the four levels for various organizational aspects.

The ‘Knowledge Pyramid’, shown in Figure 1.1, is also commonly known as ‘Wisdom Hierarchy’ or ‘DIKW Hierarchy’. The concept has been around for long, but the coinage of the model is attributed to Russell Ackoff (1989).

![Knowledge Pyramid](image)

*Figure 1.1: Knowledge Pyramid*

*Source: adapted from TRAINMOR-KNOWMORE (2010) (original adaptation from Leibowitz, J. (2003))
Organizational growth can be assured if the organization knows what among the four is possessed by the organization, how and where does the categorized level of abstraction is used and what all measures can be taken for the level not so far acquired or categorized. Confusing data with information or information with knowledge can be evaded only if the particular level of abstraction is properly recognized in reference to the given context.

1.3.1 Data

Davenport, T.H., et al. (1998), describes data as a set of discrete and objective facts about an event, whereas, Brooking, A. (1999), portrayed data as sequences of numbers, letters, pictures, etc. presented without a context. Data is a perception, a signal, a sign or a quantum of interaction, as per Gandon, F. (2000).

Data can be characterized as follows:

- Data is something that is explicit in terms of visibility.
- As it is explicit, it could be used.
- It can be exploited for further exploration.
- Data could be accepted or rejected.
- It can provide a direction.
- It is predetermined and provides efficiency.

Wellisch, H.H. (1996), explains that data becomes the basic building material for information, and the blocks of information form the base of knowledge. It is commonly seen that data is very frequently substituted for information, and information is wrongly used for knowledge. Datum is the representation of concepts or other entities, fixed in or on a medium in a form suitable for communication, interpretation, or processing by human beings or by automated systems. Quantified and/or qualified facts and figures belong to this category.
1.3.2 Information

The second level of abstraction is information. Sowell T. (1996), elucidates the verb ‘inform’ which normally is used in the sense to communicate (i.e. to report, relate, or tell) and comes from the Latin verb *informare*, which means to shape (form) an idea.

Data is persistent while information is transient, depending on context and the interpretation of the recipient. Information is data received through a communication process that proves of value in making decisions. Information can also be known as organized data which can answer queries like *what?*, *when?*, *who?*, and *where?*.

According to Davenport, T.H., et al. (1998), data becomes *information* when it is presented as a *message* that makes a difference to the receiver of the message. In other words, data becomes information when some *meaning* is added to it. Methods for adding meaning can be *contextualizing*, *categorizing*, *calculation*, *correction*, *condensation*.

Similar to data, information can also be comparatively characterized:

- Data is explicit, but information can be interpreted, as it has associations in contrast to data.
- Data can only be used; and information can help to construct.
- Data can just be exploited, where as information can be explored.
- As information can be explored on the basis of associations, it can not only be accepted, but also confirmed.
- Data provides a sense of direction, and information goes ahead and helps in communication.
- Information is surrounded by constraints, and thus helps in achieving effectiveness.
1.3.3 Knowledge

Next level of abstraction is the knowledge. According to Patterson, D.W. (2002), knowledge should not be confused with data. It consists of facts, prejudices, beliefs, and most importantly, heuristic knowledge. Thus, we can say that knowledge includes and requires the use of data and information. But it is more. It combines relationships, correlations, dependencies, and the notion of gestalt with data and information. Knowledge is having a familiarity with language, concepts, procedures, rules, ideas, abstractions, places, customs, facts, and associations, coupled with the ability to use these notions effectively in modelling different aspects of the world.

Sowell, T. (1996), adds that knowledge involves both data and the relationships among data elements or their sets. This organization of data based on relationships is what enables one to draw generalizations from the data so organized, and to formulate questions about which one wishes to acquire more data. That is, knowledge begets the quest for knowledge, and it arises from verified or validated ideas.

Knowledge as depicted by Davenport, T.H., et al. (1998), is said to be transformed from information by humans through methods of

- comparison,
- consequences,
- connections, and
- conversation.

For instance, when a person makes a comparison of some information with another situation previously encountered, knowledge is derived. Knowledge is a fluid mix of framed experience, values, contextual information, and expert insights that provides a framework for evaluating and incorporating new experiences and information. It originates and is embedded in the minds of those who know it. In organizations, it often becomes embedded not only in
documents or repositories but also in organizational routines, processes, practices, and norms.

Dave, M., et al. (2012), have explicated that knowledge can be required for content of study and may be objective or subjective. It may be required for policy formulation, decision making, or for some administrative or management based decision. Collection of proper input, selection of quality attributes, and focus on output is very important for knowledge. Both knowledge and information are context specific and relational; however, information is moreover factual, whereas knowledge is a true justified belief.

Similar to data and information, a higher level of abstraction ‘knowledge’, can also be characterized:

- Knowledge is available in both forms: explicit and embedded. As we interpret information, the further storage gets converted into these two forms.
- We exploit data, and we explore information, but knowledge becomes the base for creation.
- It does not only create, but a higher level of rebuilding or rearrangement can be achieved by it.
- Information helps in communication, whereas knowledge is the key to decision making.
- We reach from efficiency to effectiveness, when we move from data to information. With knowledge, we carve a path for innovation. Knowledge brings flexibility and thus a higher level of perception is attained.

1.3.4 Wisdom

In the view of Rowley, J., et al. (2006), wisdom is the ability to increase effectiveness. Wisdom adds value, which requires the mental function that we
call judgment. The ethical and aesthetic values that this implies are inherent to the actor and are unique and personal.

Zeleny, M. (1987), explains that while data and information are piecemeal, partial and atomized by their very nature, knowledge and wisdom are ‘holistic’ related to and expressed through systemic network patterns, integrative by definition. He further adds that to manage wisely implies knowing why to do something; to manage effectively implies knowing what to do; to manage efficiently implies knowing how to do it (and to ‘muddle through’ implies nothing and having ‘lots of data’ around).

It is wisdom that further paves the path for enlightenment, as shown in the Figure 1.2:

![Figure 1.2: From Data to Enlightenment](image)

Source: adapted from Jean-Baptiste, P.L.F., et al. (2008)
1.4 Knowledge Management in respect to Organization

According to Alainati, S. (2011), knowledge management is a combination of data, information, experience, context, interpretation and reflection, and provides a more focused and coherent solution to an organization.

Wiig, K. (1997), states that knowledge management is a systematic, explicit and deliberate building, renewal and application of knowledge to maximize a firm’s knowledge-related effectiveness and returns from its knowledge assets.

In the perception of Salleh, Y., et al. (2002), definition of knowledge management states that it is a process of leveraging knowledge as means of achieving innovation in process and products/services, effective decision-making, and organizational adaptation to the market for creating business value and generating a competitive advantage to organizations.

As per Nonaka, I. (1988), part of understanding and building up an organisation, is for the organisation to be able to interact within its environment and know how to create, distribute and manage information, knowledge, and innovation.

Polanyi, M. (2009), argues that the individual’s commitment is what makes them active in creating knowledge; thus, it is considered to be the most important element in promoting the formation of knowledge within the organization.

van den Bosch, F.A.J., et al. (2001), have focused on defining what managerial knowledge and managerial capabilities are, what services are rendered by them, how they interrelate with organizational knowledge creation processes, and how front-line, middle, and top managers can contribute to a firm's organizational competences. Their paper ‘Creation of Managerial Capabilities through Managerial Knowledge Integration: A Competence-
Based Perspective’, explores ways in which individual managers' knowledge becomes integrated to create managerial capabilities in an organization. According to them, in the search to explain the competitive successes of firms, management scholars have paid attention to knowledge resources and knowledge creation processes as primary sources of competitive advantage. Because knowledge serves as the base upon which capability is formed, knowledge may create barriers to imitation by rivals. Knowledge may therefore account for the larger part of a firm's value added services.

In dynamic environments, knowledge creation processes are especially crucial, because new knowledge resources enable a firm to respond to the changing demands imposed by the environment over time (Nonaka, I., et al. 1995).

According to Le Boterf, G. (2000), the knowledge involved in the competency concept can be considered to be either explicit knowledge – theoretical knowledge, environmental knowledge, procedural knowledge, formal know-how – or tacit knowledge – empirical knowledge (abilities), cognitive knowledge, knowing how to be (attitudes and behaviours) emotional resources, etc.

Information technology has become the backbone to knowledge management. The working of an organization can be variedly categorized/segmented as per the requirements. For differentiated segments, a large number of knowledge management tools, techniques and applications are used, which multiplies efficiency and effectiveness. These could be ascribed (could be overlapped for the segments) as follows in Figure 1.3:
Figure 1.3: Knowledge Management Tools & Techniques used in an Organization

a) **Infrastructure:** groupware, intranets, documents & summaries, knowledge management suites, knowledge maps

b) **Ideology:** concept mapping, creativity tools

c) **Identification and Accumulation:** search engines, data mining, intelligent agents

d) **Storage and Compilation:** OLAP, data warehousing, metadata, XML

e) **Custom Application:** expertise profiling, CRM, competitive intelligence
1.5 Competency Development through Knowledge Management

Hong, J. (2005), describes the commonalities in competence and knowledge management’s development: the shifting of focus from documentation and identification to leverage and integration, and, finally, the generation of knowledge and competence.

On the organizational level, competency based learning is carried out by human resource development activities. Staffing, learning, and performance management are therefore carried out around competence profiles to enhance the human resource potential, as per Bonder, A. (2011).

Knowledge in an organization can be ascribed to the four main aspects which are described as under (and also with figure 1.4):

Organizational Culture & Environment –

1. Environment should encourage informal networks
2. An ambience of mutual trust and empathy should be created
3. Freedom to knowledge sharing be encouraged
4. Easy access to help/advice be available
5. Coaching and mentoring should be promoted

Organizational Knowledge Base –

1. Adequate documentation and usage of reports
2. Work manuals be maintained
3. IT-based Databases be compulsorily used
4. Work related summarization be encouraged
5. Usage of Groupware & Knowledge maps
Edifice of Organization –

1. Limited hierarchies should be maintained
2. Inter-departmental communication be encouraged & rewarded
3. Channels of communication should be identified. Regular but informal monitoring of the channels should be carried out for further development and creation of new channels.

Organizational Guidelines –

1. Policies should be fostered for promoting and rewarding knowledge dissemination
2. Cross-functional teamwork be encouraged
3. Regular sharing & upgradation of organizational goals, objectives, and visions
4. Adequate autonomy for putting forward new initiatives or proposals for knowledge creation and sharing.
Figure 1.4: Organizational Aspects in reference to Knowledge
Knowledge management techniques for the following organizational competencies need to be developed and explored:

a) **Knowledge Management techniques for competence recognition:** According to Ley, T., et al. (2003), the most general technique is the use of structured or unstructured interview techniques. In the view of Yu, E. (1999), for the identification of new and formerly unidentified competencies, a goal oriented modelling may be envisioned, focusing on the mission or the objective to be achieved.

b) **Knowledge Management techniques for acquiring competence:** As per Garro, A. (2003), with a set of available/possible learning resources, advanced e-learning system (with interrelated archives) should be designed, which should help the employees to decide and to plan his/her own learning.

c) **Knowledge Management techniques for assessing competence:** Monitoring systems built within e-learning system modules which can detect any type of inconsistency and deviations and report and compile it in a structured way. A slight higher version to this could be development and implementation of customized expert systems.

d) **Knowledge Management techniques for optimal utilization of competencies:** Coaching and mentoring with IT-based tools and work manuals would be the best practice for optimal utilization of organizational competencies. Besides, for new recruitments, the existing and regularly updated ontological setup will help to get the best outcome.
1.6 Research Objectives

The objective of the present research work is twofold:

- Firstly, to study the state of the art in knowledge management, focusing attention on organizational competencies; and

- Secondly, to study and analyze the level of the understanding and clarification in the employees, related to the technological advancements carried out at the work place, and to suggest measures for improvement.

This research work draws heavily from a range of knowledge management and competency management research published in the academic literature (in journals/online articles). An exhaustive approach is adopted to provide a holistic view and elucidation of knowledge management and competency management research and other related issues.

This work also aims to clarify and elaborate the conceptual issues and carry out a comparative analysis on the development of the knowledge and competence perspectives.

The key issues covered under the first head are as follows:

- Identifying and critically reviewing the distinct perspectives on knowledge management.

- To improve the understanding of traditional knowledge management models in light of today’s advancements, emphasizing the significance in present context.

- To provide a review of knowledge management literature by providing information about different knowledge management generation
models, knowledge management processes and knowledge management framework.

- To provide a platform to better comprehend how various tools and techniques are assembled for managing these activities and enabling a clearer understanding of knowledge management for an organization.

- To draw attention to the relationships among identical concepts of data, information, knowledge, wisdom, and enlightenment, along with the nature of understanding that specifies the subtle differences among these constructs.

- To adopt such a frame of reference which describes knowledge management activities with lucidity incorporating special orientation of current knowledge management practices.

- To find out the developments with respect to the implementations of any knowledge management strategies in the organizations.

- To enable, identification of facilitators of knowledge management, that leads to bridging the gap between theory and practice, in academia and in the industry.

- To highlight the present opportunities to the knowledge sector to incorporate such practices into its curriculum.

- The aim of this research work is to investigate how knowledge management contributes to the development of organizational competencies and to enhance innovativeness in the further processes.

- This work also aims to address the existing gaps in the understanding and execution of the knowledge management tasks in an organization and to suggest methods that can be used to synthesize the knowledge management tools with organizational competencies.
• To examine the use of types of knowledge within organizations.

• This research work discusses and suggests what can be done to promote knowledge sharing among the employees so that overall performance can be improved. The use of knowledge management for leveraging organizational competencies is still in its nascent stage in many organizations. This area needs to be explored and developed in a much better way.

• To recognize and define competencies for knowledge management and learning.

• To identify useful knowledge management and learning tools for application in respective work areas.

• Given the popularity and research value associated with knowledge management, the aim is to explore these factors in detail.

• The research work also seeks to analyze the requirements for knowledge management based organizational competencies in depth, for the utilization of human resources towards augmented organizational performance.

The key issues covered under the second head are as follows:

• Analyze the typical organizational competencies.

• To analyze the state of the knowledge management based organizational competencies.

• To scrutinize the response of employees to the various technological up gradations.
• To examine the competency level of the employees for knowledge accumulation, segmentation, processing and analysis.

• To analyze how dexterous the employees are in the usage of advanced knowledge management tools and techniques.

• To emphasize the importance of understanding knowledge management as a concept to facilitate the assigned work practices of knowledge management practitioners in an organization.

1.6.1 Research Design/Approach

• Firstly, the complete setting is analyzed. Competencies are defined, measured and assessed.

• Further through this data, competencies are categorized and catalogued.

• The subsequent analysis is done through the use of appropriate and relevant statistical tools.

• Various graphs, charts, diagrams and tables are also used for analysis and interpretation of data.

• This work is firmly based in psychological conceptions of human competence and performance in the workplace.

Existing literature contributed by several authors has been integrated to provide a clear description of the type of activities/processes/framework/models being included under the umbrella of knowledge management.
1.7 Relevance of Research

The research work is an effort to lift the veil of mystery that presently enshrouds knowledge management and to facilitate wider implementation of knowledge management practices, thereby realising the true potential of a knowledge-based economy.

A sample of 210 knowledge workers and other working professionals was surveyed, using web-based questionnaire with 31 questions, using a five-point scale to measure the degree of personal assessment of each competency. Further structural statistical techniques were applied for detailed evaluation and analysis of the relationships among the given parameters.

- The interpretive approach adopted in the research work is focused on the understanding of the conceptual framework, implementation, processes and implications of knowledge management initiatives and technology in an organization.
- For growth and effectiveness, organizations need not only require migration from a traditional approach to advanced knowledge management oriented culture, but also to create specialized organizational values, skills and competencies. Such a culture is nurtured only when there is a confluence of perspectives of knowledge management, advanced information technology and competency management.
- Though there is no direct relationship between knowledge management and organizational performance, but the confluence of effective implementation of knowledge management techniques & tools and organizational competencies contributes positively to enhanced performance.
• Knowledge management tasks should bring forth the knowledge from knowledge workers in a structured manner. Knowledge being an essential organizational resource that boosts up all value-creating activities, it is imperative that knowledge management permeates all levels of knowledge workers in an organization in order to produce significant impact on their respective performance.

• The research work is an effort in the direction to promote wider use of knowledge management methodologies and technologies by knowledge management workers and practitioners in organizations.

• As this research work focuses on the practical implementation of knowledge management, obstructions to successful knowledge management tasks are discussed and such critical success factors are explored which help to improve the organizational performance.

• One of the prominent roles of knowledge management experts in organizations is to design and operate their knowledge management system in such a manner that ensures the optimum utilization of its available knowledge resources. The knowledge workers’ role in the management of knowledge becomes even more critical when there is rapid advancement in this field.

• Given the changing competitive environment in today’s knowledge based organizations, employees of these organizations are required to recognize organizational competencies so that they can master them for increasing effectiveness. Knowledge management based set of competencies assist the organization to gain success in diverse areas.

• The research work is a step in direction of presenting the holistic nature of data, information and knowledge. Traditional definitions and
models related to them are also reviewed and their strengths are highlighted.

1.8 Limitations of the Study

- Sample size is limited to 210 people only. The sample size may not adequately represent the whole population.

- There could be a possibility of slight error in data collection because some of the respondents might not have provided the actual answers to the asked questions.

- Even though a chi-square test may show statistical significance between two variables, the relationship between those variables may not be substantively important.

- The test of significance is based on the assumption that the observations are drawn from a normal distribution.

1.9 Organization of the Thesis

The research work is organized into following heads:

Chapter 1: The Introductory chapter comprises of the Overview of Knowledge Management and Organizational Competencies, The Knowledge Revolution, The Knowledge Hierarchy, Knowledge Management in respect to Organization, Competency Development through Knowledge Management, Research Objectives, Relevance of Research and Limitations of the Study.

Chapter 2: This chapter deals with the literature review under the sub heads of Types of Knowledge, Definitions of Knowledge Management, Generations of Knowledge Management, Overview of Knowledge Management Processes, Key Knowledge Management Processes, Knowledge Management Models, Definitions of Competence, Overview of Competency, Competency...
Development, Competency Analysis, Competency Management, and Competency Framework.

Chapter 3: This chapter discusses the emerging tools & technologies in the field of Knowledge Management with the contents comprising of Enterprise 2.0, Semantic Web (Web 3.0) and Ubiquitous technologies.

Chapter 4: This chapter is dedicated to the Research Methodology comprising of the Objectives, Research Design and Data Sources, Questionnaire Design, Methodology, Hypothesis Testing, Test for Association/Dependence, Sampling and Demographic Segmentation.

Chapter 5: This chapter revolves around the Data Processing and Analysis subdivided into Analysis of Knowledge Management based Organizational Competencies Questionnaire, Segmented Analysis based on diverse Organizational Competencies Skill Sets, Hypothesis Testing and Measure of Association.

Chapter 6: This chapter highlights the Results of the research work done (in the backdrop of Knowledge Management based Organizational Competencies).

Chapter 7: The concluding chapter of this thesis discusses the Suggestions for knowledge management based competence-performance enhancement.

References: This section lists down the works of interest in reference to the subject of the present research work.

Appendices: The appendices include three sections – Appendix I enlists some of the well known knowledge management software providers. Appendix II comprises of the questionnaire used in the research work and Appendix III contains two research publications of the author of the thesis.