

A state-of-art review on basic issues on knowledge management

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ABSTRACT

For many centuries, knowledge has been acting as the backbone of the progress of mankind but very recently it has been supplemented with the concept of management. Yet, the term knowledge management (KM) is being coined very recently and it has gained very huge popularity. Today, organizations have recognized the importance of knowledge management and are continuously working with it. The research paper is dedicated to different aspects of knowledge management and focuses on different views of the researchers on knowledge, knowledge management, KM processes, objectives, benefits, myths and errors.

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1. Introduction

In recent years, knowledge management has become a critical subject of discussion in the business literature. Both business and academic communities believe that by leveraging knowledge, an organization can sustain its long-term competitive advantages (Bhatt, 2001). KM implementation is one of the major attractions among the researchers and practitioners. The business organizations are more concerned about building the knowledge assets for their competitiveness (Singh & Kant, 2008). Business and academic circles have been conducted on knowledge management for nearly three decades on the research of theory and practice (Tong, 2009). Large numbers of organizations are taking great interest on the idea of knowledge management and many are launching knowledge management initiatives and programs (Storey & Barnett, 2000). The area of KM is taking on renewed significance with the emergence and ascendancy of the knowledge worker (Maheshwarkar & Sohani, 2013). Investing in developing the knowledge and capabilities of a company's workforce is becoming a measure of the value of an organization because this investment is now seen as increasing the knowledge content and capability of an organization. At the same time, such an investment also helps to attract the best knowledge workers in a highly competitive knowledge worker market (Binney, 2001). According to Davenport et al. (1998) such knowledge management projects attempts to do something useful with knowledge to accomplish organizational objectives through the structuring of

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people, technology and knowledge content. Indian organizations too have not been far behind with some using it as an integrated approach towards developing competencies for sustainable competitive advantage. Knowledge management has become increasingly important as organizations realize that effective use of their vast and varied knowledge assets and resources provides them with the ability to innovate and respond to fast changing customer expectations (Zhao, 2011).

2. Evolution of knowledge management

Although the term *knowledge management* formally entered popular usage in the late 1980s (e.g., conferences in KM began appearing, books on KM were published, and the term began to be seen in business journals), philosophers, teachers, and writers have been making use of many of the same techniques for decades (Wells, 1938). The Entovation timeline (available at <http://www.entovation.com/timeline/timeline.html>) identifies a variety of disciplines and domains that have blended together to emerge as knowledge management. The details of this timeline are given in Table 1.

Table 1
A Timeline of Knowledge Management

S. No	Year	Book Publication	Research Event	Initiatives
1.	1988	Know-How Company by Sveiby; Managing the Knowledge Asset into the 21 st Century by Amidon; Mobilizing Invisible Assets by Itamik.	Prude conference on Roots of Knowledge Innovation	Creation of offices of technology transfer; Integration of people and business planning; European research initiatives; Focus of manufacturing; Cross Disciplinary research
2.	1989	Age of Paradox by Handy	International conference of Management and Technology, England	Benchmarking
3.	1990	New Realities by Drucker; Slovan Global Innovation Strategy by Amidon		
4.	1991	Fifth Discipline by Senge; Fifth Generation Management by Savage; Origins of Knowledge Based Firm by Amidon; Knowledge Revolution by Sakniya	Agile Manufacturing Conference, Texas	First CKO Edvinsson
5.	1992	Intelligent Enterprise by Quinn; Knowledge Creating Company by HRB Nonaka; Leadership and The New Science by Wheatley	Knowledge Management Conference, Canada; Knowledge Productivity Conference Steelcase/ED S	Creation of European Union; Realization of Strategy as Leadership;
6.	1993	Age of Network by Lipnack and Stamps; Control Your Destiny or Someone Else Will by Tichy and Weich Workforce (2000)		Information Technology as a Competitive Weapon; Values of Learning Systems Theory; New view of innovation;
7.	1994	Knowledge Management Foundations by Wiig; Creating Creativity and Innovation in Large Bureaucracies by Kuhn; Japanese Technology Transfer by SRC		Accelerated Computer Communications Technology; Council on Competitiveness; Reinventing Government: Networking;
8.	1995	Rise and Fall of Strategic Planning by Mintzberg; The Web of Inclusion by Helgesen; Information Technology in Services Society by NRC; Your Company's Most Valuable Asset: Intellectual Capital by Stewart	Dozens of Knowledge Conferences (US)	Foundation of Knowledge Media (e.g. FAST Co., and Knowledge Inc.); Profiles of Customer Innovation;
9.	1996	Agile Competitors and Virtual Organisations by Goldman, Nagel and Preise;	Dozens of Knowledge Conferences (Europe)	Emerging Community of Knowledge Practice; Explosion of Worldwide Web; The Balanced Scorecard Technique by Kaplan and Norton
10.	1997	Works reported by Davenport, DeKerckhove, Allee, Prusack, Brooking, Stetwart, Sveiby, Edvinsson; BI Report by Skyrme and Amidon; The Ken Awakening by Amidon		Emerging KM practice begins in Financial, HR, IT, Quality, R& D/Technology Transfer, Engineering, Manufacturing, Marketing/ Planning, Sales/Service, Alliances/Joint Ventures
11.	1998			Knowledge Kaleidoscope; Entovation R&D (Beyond 5 th generation); Collaborative Innovation Amidon
12.	1999			Incentives; Certification of Knowledge Innovation Standards; Awards; Worldwide Innovation Congress; World's Fair (Germany); Roundtable for Innovators from Around the Worked
13.	2000	Creation of IMF Equivalent for The World Trade of Ideas		

3. Data, information and knowledge

According to Bhatt (2001), defining data, information, and knowledge is difficult. Only through external means or from a user's perspectives, one may distinguish between data, information, and knowledge. Tian et al. (2009) say that in many KM literatures it is often pointed out that it was important to distinguish between data, information and knowledge (Tuomi, 1999). Nonaka (1998) made a clear distinction between information and knowledge by defining knowledge as follows. First, knowledge is different from simple information; knowledge is about trust and promise. That is, knowledge functions as a specific attitude, outlook and intention. Second, knowledge is different from information in that it is about certain behaviors. Third, knowledge deals with meanings; knowledge is content-oriented and has a correlation with contents. Knowledge is more than just knowing something. Knowledge is an invisible asset that provides certain standards for decision-making and has various individual elements in it, such as personal insights, judgments and improvement skills based on one's learning and experience. Knowledge lies above information in its concept. Facts, data and information go below knowledge. Facts exist objectively and data are the lowest form of certain known facts that essentially have no meaning by themselves (Myburgh, 2000). Zack (1999) argues that data can be considered as facts or observations whereas information is data in a context; knowledge is information that is accumulated and organized in a meaningful way. Tuomi (1999) makes the iconoclastic argument that the often-assumed hierarchy from data to knowledge is actually inverse. He argues that knowledge exists which, when articulated, verbalized, and structured, becomes information which, when assigned a fixed representation and standard interpretation, becomes data. As such, raw data do not exist – even the most elementary piece of *data* has already been influenced by the thought or knowledge processes that led to its identification and collection. Fig. 1 shows the details of the concept provided by Tuomi (1999). Alavi and Leidner, (2001) state information is converted to knowledge once it is processed in the mind of individuals and knowledge becomes information once it is articulated and presented in the form of text, graphics, words, or other symbolic forms. Braganza (2004) also proposes a knowledge-information-data (KID) model based on a case study, which suggests knowledge leads to information, which determines data. It reversed the commonly accepted hierarchy, which assumes that knowledge is a product of data and information (Tian et al., 2009). Although the term *knowledge management* formally entered popular usage in the late 1980s (e.g., conferences in KM began appearing, books on KM were published, and the term began to be seen in business journals), philosophers, teachers, and writers have been making use of many of the same techniques for decades Tian, et al. (2009).

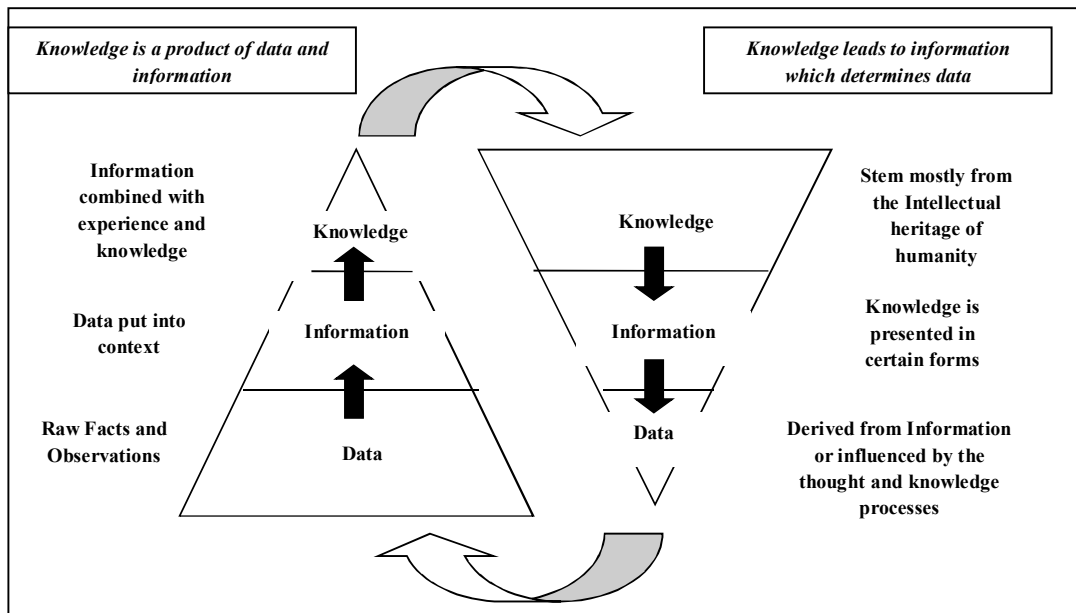


Fig. 1. Hierarchy for Data-Information-Knowledge (Tian et al., 2009)

Table 2 shows the summary of definitions of data, information and knowledge proposed by the researchers in the field of knowledge management:

Table 2

Definitions of data, information and knowledge (adapted from Awad and Ghaziri, 2006)

Data	Information	Knowledge
Statements about reality (Acharya, 2000)	Organized, systematized data (Acharya, 2000)	Human interaction with reality (Acharya, 2000)
Unsorted bits of fact (Dixon, 2000)	Data that has been sorted, analyzed, and displayed (Dixon, 2000)	Meaningful links people make in their minds between information and its application in action in a specific setting (Dixon, 2000)
A representation of a fact, number, word, image, picture, or sound; Measurements (Applehans et al., 1999)	Data that has been assigned a meaning (Liebowitz and Wilcox, 1999)	The whole set of insights, experiences, and procedures that are considered correct and true and that, therefore, guide the thoughts, behavior, and communication of people (Liebowitz & Wilcox, 1999)
A discrete, objective fact about events (Davenport & Prusak, 2000)	Potential for action; resides in the user (Malhotra, 1998)	Ability to turn information and data into effective action (Applehans et al., 1999)
	A statement of fact about measurements (Applehans et al., 1999)	An organizational resource consisting of the sum of what is known (Holsapple & Whinston, 1996)
	Descriptive knowledge (characterizing the state of some past, present, future, or hypothetical solution) (Holsapple and Whinston, 1996)	A fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information (Davenport & Prusak, 2000)
	Data that makes a difference (Davenport & Prusak, 2000)	Systematizing and structuring information whose validity has been established through tests of proof (Libeskind, 1996)

4. KM definition

KM is an evolving discipline (Anantatmula & Kanungo, 2006). KM and its implications are frequently discussed at seminars and conferences (MaËrtensson, 2000). Researchers and academics have taken different perspectives on knowledge management, ranging from technological solutions to the communities of practices, and the use of the best practices (Bhatt, 2001). The number of companies claiming to work with knowledge management is growing steadily (MaËrtensson, 2000). However, so far, a standard definition of knowledge management has not been reached (Qi & Liu, 2010). Some of the definitions proposed by the researchers in the field of knowledge management are given in Table 3.

5. Knowledge management process

In today's scenario, knowledge is regarded as the most important strategic resource in organizations, and therefore, KM process is considered critical for organizational success (Dalpati et al., 2010). Knowledge management process with a strategic view can help organizations to manage the information and knowledge it has (Bishwas, 2011). In the year of 2005, Anantamula (2005) reported that knowledge management processes and the resultant knowledge must translate to knowledge management outcomes such as improved communication, and enhanced collaboration; together they lead to improving employee skills thereby leading to higher productivity and better decision making. Table 4 shows a summary of definitions of knowledge management process, proposed by the researchers in the field of knowledge management.

Table 3
Definitions of KM

S.No.	Author And Year	Definition
1.	Singh and Kant (2008)	Knowledge management is the deliberate and systematic coordination of an organization's people, technology, processes and organizational structure in order to add value through reuse and innovation.
2.	Qian and Tian (2008)	Knowledge management is considered as a key part of the strategies to use knowledge to create a sustainable competitive advantage in organizations.
3.	Mathi (2004)	Knowledge management is a process that helps organizations find, select, organize, disseminate, and transfer important information and expertise to gain business advantage.
4.	Wei and Bi (2008)	Knowledge management refers to the set processes or practice of developing in an organization the ability to create, acquire, capture, store, maintain and disseminate the organization's knowledge.
5.	Davenport and Prusak (2000)	Knowledge management as an effort for discovering the treasure hidden in people's minds and turning it into the assets of organization in such a way that a great number of people who are engaged in decision making processes of organization can access and make use of this treasure.
6.	Barron (2000)	A systematic and unified method to recognize, use, and share the accessible experiences and specializations in an organization
7.	Bahra (2001)	Knowledge management as a general description of culture, processes, fundamentals, and technologies available in an organization which makes possible the absorption, development, and improvement of knowledge asset of an organization to reach its strategic goals.
8.	Bahra (2001)	A movement which will dominate the world of future.
9.	Dongxiao and Jianqing, (2010)	Knowledge management is a process to improve the competitiveness of enterprises and identify the knowledge, acquire it and play its full role in the process.
10.	Beckman (1999)	The dissemination of knowledge throughout the organization, which results in the improvement of performance and efficiency of the organization.
11.	Cao et al. (2010)	Knowledge management is the source to improve enterprise core competitive ability in the knowledge economic ages.
12.	Wenzhi (2010)	The creation, acquisition, sharing, and utilization of knowledge for the promotion of organizational performance.
13.	Qi and Liu (2010)	Knowledge management is an important part of enterprise management in the 21st century.
14.	Wang et al. (2011)	The enterprise knowledge management is an effective interaction organized for realizing the goal of management between knowledge and valid human acts.
15.	Greiner et al. (2007)	Knowledge management includes all the activities that utilize knowledge to accomplish the organizational objectives in order to face the environmental challenges and stay competitive in the market place.
16.	Bhatt (2001)	Knowledge management is a comprehensive process of knowledge creation, knowledge validation, knowledge presentation, knowledge distribution, and knowledge application.
17.	Beng and Liew (2008)	Knowledge management is one of the major driving forces of organizational change and value creation
18.	Anantatmula and Kanungo (2006)	KM is an evolving discipline.
19.	Marques and Simon (2006)	KM is considered a managerial system that captures established models of organization and broadens them to provide a practical methodology.
20.	Binney (2001)	Knowledge management (KM) is the subject of much literature, discussion, planning and some action.
21.	Newman and Conrad, (1999)	Knowledge management is not one single discipline. Rather, it an integration of numerous endeavors and fields of study. Knowledge management is a discipline that seeks to improve the performance of individuals and organizations by maintaining and leveraging the present and future value of knowledge assets. Knowledge management systems encompass both human and automated activities and their associated artifacts.
22.	Department of the Army Washington (2012)	Knowledge management (KM) is the process of enabling knowledge flow to enhance shared understanding, learning, and decision making.
23.	Omona et al. (2010)	KM is a discipline that is concerned with the analysis and technical support of practices used in an organization to identify, create, represent, distribute and enable the adoption and leveraging of good practices embedded in collaborative settings and, in particular, in organizational knowledge processes.
24.	Ahani et al. (2013)	Knowledge management (KM) referred to as the new paradigm of the management area provides an answer to the country's requirements based on the management of nation's intangible assets.
25.	Sen (2009)	In the organizational context, KM refers to identifying and leveraging the collective knowledge in an organization for facing the competition.
26.	Singh and Kant (2008)	KM is the deliberate and systematic coordination of an organization's people, technology, processes and organizational structure in order to add value through reuse and innovation.
27.	Deng and Tian (2008)	Knowledge management is considered as a key part of the strategies to use knowledge to create a sustainable competitive advantage in organizations.
28.	Tong (2009)	Enterprise knowledge management is essentially a management innovation activity, covering the production of relevant knowledge, knowledge organization, and knowledge dissemination, knowledge marketing, knowledge application, knowledge consumption and all aspects of personnel management.
29.	Folorunso et al. (2011)	Knowledge management is a new important information technology-based business paradigm for achieving competitive advantage, and it is no surprise that it has received so much attention from researchers.
30.	Mathi (2004)	Knowledge management is a process that helps organizations find, select, organize, disseminate, and transfer important information and expertise to gain business advantage.
31.	Lopez et al. (2004)	Knowledge management is a rather a new phenomenon and is in the initial stages of its exploration. In order to develop new knowledge and use the knowledge which already exists within organizations, it seems essential to create an atmosphere of trust and security to encourage innovation, experimentation and risk taking
32.	Nonaka (2007)	Knowledge management is a human resource management exercise than a technology based discipline. It is not merely state of the art technology used to improve efficiency of the knowledge. Rather it is an exercise about how people can be motivated, best utilize their knowledge, experiences and enhance the creativity by using state of the art technology.

Table 4
Summary of KM Process Definitions

S.No	Researcher (s)	Phases of KM process
1.	Chen and Chen (2006)	Creation → Circulation → Conversion → Completion
2.	Lee et al. (2005)	Creation → Accumulation → Sharing → Utilization → Internalization
3.	Chen et al. (2001)	Capture → Collaborate → Correct → Circulation → Create
4.	Liebowitz (1999)	Identify → Capture → Store → Share → Apply → Sell
5.	Davenport et al. (1998)	Creation → Transference → Asset management
6.	Beckman (1997)	Identify → Capture → Select → Store → Share → Apply → Create → Sale
7.	Alavi (1997)	Acquisition → Indexing → Filtering → Linking → Distribution/ Application
8.	Nonaka and Takeuchi (1995)	Creation → Access → Dissemination → Completion
9.	Wiig (1993)	Creation → Manifestation → Use → Transfer
10.	Andersen and APQC (1996)	Share-create → Identify → Collect → Adaptorganize → Apply
11.	Ruggles (1997)	Generation → Codification → Transfer
12.	Vander spek and Spijkervet (1997)	Develop → Distribute → Combine → Hold
13.	Angus et al. (1998)	Gathering → Organizing → Refining → Disseminating
14.	Holsapple and Joshi (1998)	Acquisition → Selection → Internalization → Use
15.	Jackson, (1999)	Gathering → Storage → Communication → Synthesis → Dissemination
16.	Davenport and Prusak, (2000)	Generate → Codify → Transfer
17.	Heisig et al. (2001)	Create → Store → Assimilation → Apply
18.	Probst (2002)	Identification → Acquisition → Development → Distribution → Utilization → Preservation
19.	Tyndale (2002)	Creation → Organization → Distribution → Application
20.	Rollet (2003)	Planning → Creating → Integration → Organizing → Transfer → Maintenance → Assessment
21.	Hedlund (1994)	Knowledge acquisition → Knowledge Store → Knowledge Transfer → Knowledge Application → Knowledge Protection
22.	Van et al. (2001)	Acquiring Knowledge → Establishing Knowledge → Knowledge Dissemination And Use → Developing knowledge → Applying Knowledge
23.	Fong and Choi (2009)	Acquisition → Creation → Storage → Distribution → Use → Maintaining
24.	Anand and Singh (2011)	Knowledge Capture And Creation → Knowledge Organization And Retention → Knowledge Dissemination → Knowledge Utilization
25.	Mishra and Bhaskar, (2011)	Knowledge Creation → Knowledge up-gradation → Knowledge Dissemination → Knowledge Retention
26.	Bhatt, (2001)	Creation → Validation → Presentation → Distribution → Application
27.	Soliman and Spooner, (2000)	Create → Capture → Organize → Access → Use
28.	McElroy, (2000)	Knowledge Production → Knowledge validation → Knowledge integration

6. Objectives of KM

Some of the objectives of KM are listed as follows:

1. To avoid re-inventing of the wheel in organizations or reduce duplication of Knowledge-based activities. Basically the intent is full knowledge utilization (Andriessen, 2004a, b),
2. To facilitate continuous innovation that can be capitalized (Andriessen, 2004a, b),
3. To increase people competencies and thus organizational competencies that would eventually lead to greater competitiveness Andriessen (2004a, b),
4. To improve organizational flexibility towards change and innovation. (Soliman and Spooner, 2000),
5. Create knowledge repository (Davenport et al., 1998),
6. Improve knowledge assets (Davenport et al., 1998),
7. Enhance the knowledge environment(Davenport et al., 1998),
8. Manage knowledge as an asset (Davenport et al., 1998),
9. Supporting innovation, the generation of new ideas and the exploitation of the organization's thinking power; (Levett & Guenov, 2000),
10. Capturing insight and experience to make them available and usable when, where and by whom required; (Levett & Guenov, 2000),
11. Making it easy to find and reuse sources of know-how and expertise, whether they are recorded in a physical form or held in someone's mind; (Levett & Guenov, 2000),
12. Fostering collaboration, knowledge sharing, continual learning and improvement; (Levett & Guenov,2000),
13. Improving the quality of decision making and other intelligent tasks; (Levett & Guenov, 2000),
14. To understand the value and contribution of intellectual assets and increasing their worth, effectiveness and exploitation. (Levett & Guenov, 2000),
15. To make the enterprise act as intelligently as possible to secure its viability and overall success (Wiig, 1993; Dingsøy, 2002),
16. To otherwise realize the best value of its knowledge assets (Dingsøy, 2002).

7. Applications of knowledge management

Table 5 shows some of the applications proposed by the researchers (Binney, 2001; Bond, 2003).

Table 5
Applications of Knowledge Management

Transactional	Analytical	Asset management	Process	Developmental	Innovation and Creation
Case based reasoning (CBR)	Data warehousing	Intellectual property	Total quality management	skills development	Communities of practice/ interest
Help desk applications	Data mining	Document management	Benchmarking best practices	Staff competencies	Collaboration
Customer service applications	Business intelligence	Knowledge valuation	Quality management	Learning	Discussion forums
Order entry applications	Management information systems	Knowledge repositories	Business process reengineering	Teaching	Networking
Service agent support applications	Decision support system	Content management	Process improvement	training	Multi disciplined teams

8. Benefits, Myths, and errors of knowledge management

Table 6 shows some of the applications proposed by the researchers.

Table 6
Benefits, Myths and Errors of Knowledge Management

S.No.	BENEFITS	ERRORS Fahey and Prusak (1998)	MYTH Awad. and Ghaziri, (2006)
1.	Better decision making Singh et al. (2006) Dalkir (2005) Chase (1997)	Not developing a working definition of Knowledge	Knowledge management is fad
2.	Smoother collaboration Singh et al. (2006) Dalkir (2005)	Emphasizing knowledge stock to the detriment of knowledge flow	Knowledge management and data warehousing are essentially the same
3.	Enhanced learning Dalkir (2005)	Viewing knowledge as existing predominantly outside the heads of individuals	Knowledge management is a new concept
4.	Improved communication Chase (1997)	Not understanding that a fundamental intermediate purpose of managing knowledge is to create shared context	Knowledge management is mere technology
5.	Improved employee skill Dalkir (2005) Chase (1997)	Paying little heed to the role and importance of tacit knowledge	Technology distributes human intelligence
6.	Increased employee satisfaction Dalkir (2005)	Disentangling knowledge from its uses	Knowledge management is another form of reengineering
7.	New or better way of working Chase (1997)	Downplaying thinking and reasoning	Company employees have difficulty sharing knowledge
8.	Sharing best practices Davenport (1998) Singh et al. (2006) Dalkir (2005) Chase (1997)	Focusing on the past and the present and not the future	Knowledge management works only within an organization technology is a better alternative than face to face
9.	Enhanced the continuity of the organization Beijerse (1999)	Failing to recognize the importance of experimentation	It is no brainer to share what you know

9. Conclusion

The research paper has shown details of research work conducted by various researchers in the field of knowledge management. From the given literature review we can conclude that the field of KM is very large and it is being refined by various researchers year by year. The literature review has shown the understanding of researchers for knowledge and knowledge management for decades. Literature review also has indicated that yet the term knowledge management is being coined recently but this concept has grown very fast. Today, there are a lot of conferences, books and other study materials available under the banner of KM, which shows the need and importance of KM to the industries and research institutions. Literature has shown about the distinction between knowledge, information and data and the hierarchies. This distinction implies that knowledge is beyond the concepts of data and information. Literature review has also provided researchers have pointed out the various aspects of knowledge, knowledge management and knowledge management processes. All the definitions provided by the researchers help in visualizing the concepts from different perspectives. The research paper has also addressed objectives, applications, benefits, myths and errors associated with KM, which also help researchers to visualize their problem from new perspectives.

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