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2.0 LITERATURE REVIEW:

As has been seen in the first chapter, the subject knowledge management generated a lot of interest amongst the whole business world and naturally along with it a lot of research work also has been carried out by various authors, educationalists, industrial personnel, one and all without exception. The research work carried out was basically into the various aspects and the stages of KM itself, like the steps involved in total understanding and implementation of KM, analysis of different industries with respect to KM implementation and performance and viability of the same.

While an attempt is made to look into research works carried out and articles written on the subject, the emphasis has been mainly to identify the gaps that still existed in the field of research on this subject and establish a connection with the present research work.

Firstly, the works carried out by various authors with respect to specific areas of the total KM have been studied and represented and at the end of the chapter the relevance of these points to the subject of study has been depicted along with the identified gaps.

2.1. Strategy and Framework for Knowledge Management:

Hariharan, (2002), states the objective of KM is to support the achievement of business-objectives. Both knowledge-contributions / sharing as well as re-use need to be encouraged and recognized at the individual employee level as well as the company level. This is best done by measuring and rewarding knowledge-performance. Sustained strategic commitment and a corporate culture that is conducive to knowledge-performance are vital for success in Knowledge Management. Measures used to evaluate success in KM must be related to business results.

Haggie and Kingston, (2003), survey a number of different knowledge management strategies and a range of driving forces for knowledge management activities and synthesise these using an extended version of an existing "KM spectrum"; apply a knowledge engineering approach to provide further guidance for the KM spectrum;
and then describe a simple classification approach that links the driving forces to KM strategies, using a number of published heuristics.

Daghfous, (2003), uses the capabilities approach to guide those aspects of general management that materially affect the creation of distinctive and difficult-to-imitate advantages by proposing a framework that extends beyond isolated KM interventions, activities, and physical systems and propose an integrative approach to KM. The framework proposed guides general managers in turning KM into a core capability.

In the present days of information flooding through e-mails, web pages and reports, one faces a daunting task of filtering these to find what is relevant and what is useful and needs to decide what is to be retained and what is to be discarded. Achieving results in knowledge management is the product of a two fold evolution of an existing knowledge: its enhancement (depth) and its transfer (application). Some of the choices made on retaining or rejecting information which represent knowledge consequently play a key role in the availability and usability of knowledge within and organization. Holsapple and Joshi (1998), have termed the second step in the knowledge management activities as the "filtering" or knowledge selection process.

Gupta & McDaniel, (2002), investigate the vital link between the management of knowledge in contemporary organizations and the development of a sustainable competitive advantage. Five distinct hypotheses are developed, namely, Harvesting, Filtering, Configuration, Dissemination and Application, which constitute the essential ingredients of the formulated framework with practical implications for creating a competitive advantage in modern firms.

Petersen, (2001), tried to assess the Intellectual Capital/Knowledge Management (IC/KM) movement with reference to human system well-being and indicated how, against the background of main propositions of a theory of organizational well-being, the basic IC/KM framework fits into a more comprehensive and representative approach to organizations.

2.2. Critical Factors in The Successful Implementation Of Knowledge Management:

Chong and Choi, (2005), put forward that knowledge management consists of critical enablers such as employee training, employee involvement, teamwork, employee empowerment, top management leadership and commitment, organizational constraints, information system infrastructure, performance measurement, egalitarian culture, benchmarking, and knowledge structure that are critical to the success of a knowledge-based organisation. These critical factors will provide a greater understanding to the researchers and practitioners of the enablers of a successful knowledge management program. Authors’ propositions are:

Proposition 1 – Employee training is critical to successful knowledge management implementation.

Proposition 2 – Employee involvement is critical to successful knowledge management implementation.

Proposition 3 – Open and trustworthy spirit of teamwork is critical to successful knowledge management implementation.

Proposition 4 – Employee empowerment is critical to successful knowledge management implementation.

Proposition 5 – Visible top management leadership and commitment is critical to successful knowledge management implementation.

Proposition 6 – Information systems infrastructure is critical to successful knowledge management implementation.

Proposition 7 – Performance measurement is critical to successful knowledge management implementation.

Proposition 8 – Knowledge-friendly culture is critical to successful knowledge management implementation.

Proposition 9 – Benchmarking is critical to successful knowledge management implementation.
Proposition 10 – Knowledge structure is critical to successful knowledge management implementation.

Proposition 11 – Elimination of organizational constraints is critical to successful knowledge management implementation.

2.2.1 Factors for KM success: Leveraging through communication

Delmonte, and Aronson, (2004), explain that leveraging knowledge is extremely difficult and dependent more on building a culture based on effective communicating teams, and interdepartmental trust, than on information technology. The relationship between social interaction within an organization and knowledge management system success have been tested by measuring two aspects of social interaction: interdepartmental connectedness, and interdepartmental conflict the results of which indicate that there is a significant relationship between both factors and knowledge management system success.

2.3. Knowledge Evolution:

Vema, (1997), says that the knowledge evolution offers a unique and powerful road map for understanding knowledge creation, learning, and performance in everyday work. The author reframes current thinking by delving into the hidden world of knowledge supporting both individual and organizational performance, laying the foundation for the emerging art of knowledge management. From strategies for core knowledge competencies to the key components of individual expertise, The Knowledge Evolution zeroes in on the critical success factors for the knowledge-based enterprise. What emerges is an approach to knowledge management that is simple enough to communicate at every level of the organization, yet rich enough to encompass all the complexity of modern enterprises.

While there are different types of knowledge like explicit, tacit and implicit knowledges, the tacit dimension of knowledge has maximum complexity. Polanyi, (1966), believed that creative acts (especially acts of discovery) are shot-through or charged with strong personal feelings and commitments. As per him, tacit knowledge
comprises a range of conceptual and sensory information and images that can be brought to bear in an attempt to make sense of something. Many bits of tacit knowledge can be brought together to help form a new model or theory.

2.4. Information as knowledge asset:

Godbout, (1999), describes in details of the factors that influence filtering process such as time relevance, people relevance, technical relevance, authority relevance, fidelity factor and scientific acceptability factor and finally concludes that KM basically remains human.

2.4.1. Envisioning Information:

Tufte, (1990), provides practical advice about how to explain complex material by visual means, with extraordinary examples to illustrate the fundamental principles of information displays. Topics include escaping flatland, color and information, micro/macro designs, layering and separation, small multiples, and narratives. Tufte further presents a collection of some the best examples of information design ever invented, and some of the worst examples. And then he goes into the underlying principles that make the great ones sing out. Tufte, also puts forth a theory of graphical excellence to present complex data crisply, clearly, and concisely while preserving data integrity.

2.4.2. Knowledge Asset Protection:

KM is the sharing of information through out a company or even between business partners. It creates an environment in which the company leverages all its knowledge assets (Trepper), (2000).

Alstete, (2003), examines the perceptions of corporate managers regarding changes in security practices related to knowledge assets at their organizations in light of increases in security and competitive intelligence threats. The paper finds that although the companies are aware of the value of knowledge asset management, the organizations have not increased security to guard the valuable corporate knowledge.
Many corporate managers believe their company has a rudimentary understanding of the value of knowledge management today, but many companies have not implemented effective plans to protect their knowledge assets. Storage media, accessibility, types of knowledge to be protected, budget planning, inter- and intra-organizational cooperation are some of the knowledge assets that need to be protected.

Martin, (2000), finds that the local governments in Australia proved the value and importance of KM by attempting to introduce KM in order to make it function like a business entity.

In Australia, much of the writing on knowledge management is related to the private sector. Local governments have started showing interest in knowledge management understanding its importance not only in private sector but in public sector as well, showing concerns with the loss of knowledge and the deployment of mechanisms for the sharing and reuse of knowledge giving emphasis on learning and developing a growing appreciation of the value of human resources, as the creators of knowledge and the source of solutions.

Local government in Australia is the responsibility of individual state governments. Due to restructuring there are now around 700 local authorities in Australia, most of them with small populations and some covering vast areas. With the advent of new models of local government based on shared responsibility between a council and a professional city manager, the Mayor is no longer the Chief Executive Officer (CEO). Clearly in what is a much more business-like and indeed, entrepreneurial environment, those responsible for the administration and management of local government need access to the best information and knowledge available.

2.4.3. Integrating knowledge Management Technologies:

Malhotra (2005), vividly describes comprehensively the theory, research, and practices on knowledge management and develops a framework that contrasts existing technology-push models with proposed strategy-pull models. The framework explains how the "critical gaps" between technology inputs, related knowledge processes, and business performance outcomes can be bridged for the two types of models. Findings
- Suggests superiority of strategy-pull models made feasible by new "plug-and-play" information and communication technologies over the traditional technology-push models. Critical importance of strategic execution in guiding the design of enterprise knowledge processes as well as selection and implementation of related technologies is explained. This work of his is the first comprehensive analysis relating knowledge management and its integration into enterprise business processes for achieving agility and adaptability often associated with the "real time enterprise" business models. It constitutes critical knowledge for organizations that must depend on information and communication technologies for increasing strategic agility and adaptability.

Srinivasan and Horowitz, (2004a), describe a methodology that seeks to integrate concepts from the diverse fields of organizational psychology, statistical modeling and knowledge management in order to help organizations tackle complex problems that do not lend themselves to being addressed through more traditional problem solving methods. The methodology is focused on the discovery of the root causes of a given organizational challenge, using both qualitative and quantitative analysis. The model developed links ‘causal’ factors and their effects as they pertain to specified business challenges driven by KM.

2.4.4. Core competence:

Raj Kumar, (2003), says user’s energy for organizing interaction and the next knowledge process step is required for the present day collective knowledge mechanism, supported by IT. With the pace of change exceeding the mechanism’s knowing-doing capacity, the collective falls prey to wistfulness, politics and inertia to imperil decision-making. Response to change is an essential factor to maintain the core competence. The need is a better mechanism to develop and apply the collective power for walking the way.
2.5. Knowledge management socialisation process; influence of opinion leader:

Ming Yu, (2002), looks at knowledge management and the importance of knowledge management in today's organisations. Even though knowledge management has gained its popularity recently due to the drastic changes in business ecology, there is still confusion on how to implement the knowledge management strategy successfully. He investigates and suggests possible ways to communicate the concept of knowledge management more effectively so that the knowledge management concept could be implemented more successfully. The communication of knowledge management concept is done through knowledge management socialisation process which is to be carried out by the so called “opinion leader” who is presumably to be a more knowledgeable person and be able to influence others in changing their perception and behaviour.

Opinion leaders are generally defined as those individuals whose beliefs, practices and behaviours are noticed and imitated by others. If these opinion leaders are observed by others to adopt an innovation or concept that seems valued, it can begin to spread through the population. Ultimately the population norm changes as more and more people accept change. Most organisations have in fact realised the importance of the opinion leaders in facilitating the organisational change. The creation of the new position – the Chief Knowledge Officer (CKO) is one of the evidences. CKOs are viewed as the potential opinion leaders in socialising knowledge management as CKOs, who are entrusted to maximise the creation, discovery and dissemination of knowledge in the organisation are also entrusted to possess distinctive personalities such as lively, enthusiastic and able to transmit their enthusiasm to others.

Effective knowledge management pays off in fewer mistakes, less redundancy, quicker problem solving, better decision making, reduced research development costs, increased worker independence, enhanced customer relations, and improved service (Becerra-Fernandez, 1999). No matter what would be the reasons given to adopt knowledge management, there is only one end purpose of knowledge management – to adjusting quickly to the changing environment in order to boost efficiency and hence profitability.
Magnusson, and Nilsson, (2003), identified through a pan-European study of SME-practice (Small- and Medium-Sized Enterprises) and with the network organizations differentiated by degree of knowledge integration, three types of network organizations, namely Supply-chain Networks, Business Networks and Research-Networks and conclude that knowledge management activities in network organizations can be of an either facilitating or intervening nature and that the different network types display a generic pattern regarding the mix of knowledge management activities.

Allix, (2003), looks into the most recent developments in epistemology, the philosophy of science, and related disciplines on the rapidly moving edge of the cognitive sciences, and finds that a very much richer and more interesting picture of knowledge emerges than that which passes as currency in contemporary discussion and debate. He finds that the methodological resources made available by these branches of inquiry have implications for the coherent development and extension of knowledge management as a significant field of intellectual and practical application.

2.6. Communities of Practice

Lave and Wenger (1991), used first the concept of a community of practice (often abbreviated as CoP) which refers to the process of social learning that occurs when people who have a common interest in some subject or problem collaborate over an extended period to share ideas, find solutions, and build innovations. It refers as well to the stable group that is formed from such regular interactions.

Wenger, (1998), further extended the concept and applied it to other contexts, including organizational settings. More recently, Communities of Practice have become associated with knowledge management as people have begun to see them as ways of developing social capital, nurturing new knowledge, stimulating innovation, or sharing existing tacit knowledge within an organization. It is now an accepted part of organizational development (OD).

Wenger, McDermott & Snyder (2002), state that communities of Practice 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.
Over time, they develop a unique perspective on their topic as well as a body of common knowledge, practices, and approaches. They also develop personal relationships and established ways of interacting. They may even develop a common sense of identity.

In establishing principles for the cultivation of communities of practice the following are identified:

1. Design for evolution
2. Open a dialogue between inside and outside perspectives
3. Invite different levels of participation
4. Develop both public and private community spaces
5. Focus on value
6. Combine familiarity and excitement
7. Create a rhythm for the community.

2.7. Support Systems for K-worker:

Many organizations are facing the challenge of developing support systems for a class of employees described as “knowledge workers” (K-worker). Because of the unstructured, novel and complex nature of the k-worker’s tasks, the traditional approaches for system development appear to be limited, even inadequate for these types of environments. As such new approaches are needed to develop support systems for k-worker tasks. Roy,(2001), describes some previous research work that provides support for the argument that the traditional methods are limited, even inadequate, for the reengineering of work processes and system development in the k-worker environment. They derive three propositions related to the requirements of methods and approaches for these new work environments. These propositions are later tested in three case studies of system development.

Proposition 1: An appropriate representation of the information needs of the k-worker requires cognitive-based techniques and scenarios.
Proposition 2: An iterative approach based on prototyping will be required to obtain an adequate design of k-worker support systems.

Proposition 3: A successful implementation of a new organizational design, accompanied by new information systems for k-workers requires high involvement and deliberation of k-workers on social and political aspects in the environment.

Chua, (2001), finds “a recurring theme in knowledge management literature is the role played by the social interaction among organisation members”. Social interaction has been recognised as an important process through which new knowledge is created from the sharing of existing knowledge. Social interaction among organisation members involves two main components, namely, the types of knowledge shared and the types of communication channels used. Through his article he provides an approach for examining the types of knowledge shared and the types of communication channels used and also develops a framework on which empirical work could be conducted to validate the relationship between the types of knowledge shared and the types of communication channels used which serve as a guide for identifying appropriate communication channels when knowledge is shared among organisation members.

2.8. People factors critical to the success of KM initiative: Performance based design for KM:

Smith & Sharma, (2002), propose a performance-based approach to the design and implementation of Knowledge Management (KM) and set out a “New Science” foundation for the approach, and in particular explore means to shape the “people factors” that are critical to the success of a KM initiative. The theory involves “A Performance-Based Approach To Knowledge Management: Authors advocate “A Practical Three-Element “Field” System” to actualize the performance-based approach. The three systemic elements or fields are termed as Focus, Will and Capability and represent an outcomes-driven system for KM performance. In part -2 performance barriers are discussed and means to overcome them. In the third part, fundamentals for development of Sound Focus, Will and Capability Fields outlining some explicit initiatives that an organization can undertake in order to influence the
three performance fields such that "ideal" behaviours, including KM-related
behaviours, will in principle be developed and maintained. These initiatives will have
the benefit of addressing the endemic shortcomings as well.

Smith (2004), further underlines the importance of people in knowledge
management and emphasize the need to upgrade personal KM.

Lindgren, et. al., (2002), find that today many organizations are reliant on the
knowledge and competence of individual organizational members. Consequently,
information systems to support knowledge management (KM) are considered to be
vital tools in order to achieve competitive advantage. They report the results from a
field research study of such systems in a knowledge-intensive, fast-growing, and
dynamic organization. They illustrate that evolution, which refers to the process by
which organizations and their information systems change over time, needs to be
managed since it can result in KM systems failures. They also characterize the
mainstream KM research literature in relation to managing the risk of KM systems
failures and outline that management of KM systems’ evolution is a dimension that
has not been addressed so far. Building on these empirical and theoretical results, they
discussed how the evolution of KM systems could be managed and what implications
the results have for future KM research.

2.9. Managers’ role in KM

Gümüş and Hamarat, (2004), describe their findings on perceptions of tourism
managers on knowledge management level in Canakkale. An empirical study was
conducted via survey to seek how managers evaluate current knowledge level of their
organizations. Items relating knowledge processes, enabling factors for knowledge
management culture, technological and socio-cultural issues in organizations were
used as a format for the study. For successful and viable outcomes of knowledge
management, many factors play important roles. However, some of those are out of
influence of the organization while some are internal and can be arranged. Ability to
deliver desired service paradigms, ability to act timely, capabilities of employees,
innovativeness, work levels links to strategy and direction, ability to create, ability to
solve unexpected issues, effectiveness of enterprise systems, procedures and policies are some of the basic factors for effective KM.

2.9.1. Knowledge based economy revolution: managers’ role

Hussain, Lucas and Ali, (2004), state that almost every organization has recognized that in order to survive in today’s competitive and global environment, it has to face knowledge-based economy revolution. Organisations have realized the need and importance of this valuable asset. Since knowledge management caters to the critical issues of organizational adaptation, survival and competence in face of increasingly environmental change, therefore there is an essential need of managing it effectively. Three components that can play effective role in managing this valuable asset effectively include: defining effective strategies for its management, using state of art information technologies for implementing these strategies and developing knowledge management systems and a strong culture that can recognize its need and importance and thus adapt it.

2.9.2. Knowledge management change initiatives

Rabelo, (2004) compare and analyse two knowledge management change initiatives occurring in two different companies each company being an example of a global enterprise. The initiatives are analyzed from three different perspectives, namely, the strategic design, political and cultural and summary of lessons learned from these initiatives are:

- Knowledge is the key competitive weapon. Knowledge is power. The person at the top of a corporation is not necessarily wielding the greatest power. It is the person who controls the most unstable variables (knowledge) actually has greater power to effect the success (or failure) of the organization.

- Knowledge itself cannot be managed. Only the environment, activities and outcomes can be managed. Effective management of the experiences of people will reinforce their attitudes toward the benefits of shared knowledge and result in the desired cultural shift. Technology does not bend culture;
rather culture – the way of doing things – defines the role of technology – the way to get things done.

• To be effective, Knowledge Management requires not only fingertip delivery. Developing an environment and culture where people recognize the value of the knowledge they have and the need to share and for others to use that knowledge. Establishing such a culture is the most difficult aspect of knowledge management. This requires a substantial investment in people and processes.

2.9.3. Intellectual capital & knowledge networks

Napierala, Loren Weiss Selig and Zane Berge, (2005), explore the concept of intellectual capital and how organizations are using knowledge networks to build it. Knowledge networks are important in building and sharing intellectual capital. Knowledge networks have always been central to organizational health. As workers develop effective ways of doing their jobs, they share information with each other and knowledge networks grow organically. Knowledge networks can be simply defined as who communicates with whom, and who learns from whom. The emerging trend is that organizations today are working to formalize and jump start knowledge networks, so that best practices, ideas and innovations can be efficiently refined and shared. Training and development professionals contribute to this effort by creating course and performance support structures that both nurture and take advantage of knowledge networks. Even when technology is the focus and the medium for knowledge networks, emphasis has to be on facilitating peer conversation, experimentation, and shared experiences. Proven strategies for creating and nurturing knowledge networks are mentoring, coaching, and communities of practice that are supported by a variety of technologies.

2.9.4. Awareness of organisations about the importance of Knowledge management:

Nazir, et. al., (2005), indicate the awareness of organisations about the importance of Knowledge management and contend that organizations must recognize the need to
introduce processes and technologies that aim to facilitate the sharing of information and knowledge then capture it for use by the organizations. They explore the concepts of Lessons Learned (LL) and Lessons Learned System (LLS), and then demonstrate the development of Lessons Learned System (LLS) as part of knowledge management initiative to facilitate knowledge sharing.

2.9.5. Unleashing the combined power of knowledge and expertise:

Hariharan, (2005), introduces the 360-degree approach to KM which is about unleashing the combined power of knowledge and expertise from within and outside ones own organization along six inter-related dimensions for each of organisation’s top priority business measures. 360-degree KM provides each knowledge champion and each expert single-window access to all knowledge and expertise from within and outside the organization that is relevant to their top priority measure. It enables organisation’s knowledge champions and experts manage and improve performance on these measures better, faster and with zero re-invention.

Author emphasizes the need of Knowledge Management and considers if Knowledge Management is effectively deployed, it can be a powerful tool or enabler of:

1. Consistent customer experience by reducing variation in performance across time or across different geographies or units of your business
2. Speed in business results by eliminating re-invention
3. Empowering each individual employee to leverage the collective knowledge of the entire organization in serving customers
4. Converting individual knowledge into re-usable organizational knowledge – to the extent possible

For a majority of organizations worldwide, their definition of what they mean by KM and why they embarked upon a formal KM program would largely be as given above, though they may be worded differently. But more important point is how to go about it. The following questions need to be addressed.

1. How to keep KM relevant to the business
2. How to focus your KM efforts and time to effectively deliver results in top priority business areas rather than spreading your KM resources too thin

3. How to ensure real business results and performance improvements through KM

4. How KM really works

5. How to enable a single-window (360-degree) access to all Knowledge within and outside your organization that is relevant to your business

6. How to organize this Knowledge around your most critical business measures to enable your company manage and improve its performance on these measures

Answers to above questions will lead the organisation to not only successful implementation of KM but also its continued success.

2.10. Innovation in Industry:

Albers & Brewer, (2003), while emphasizing the importance and necessity of innovation and its relation to KM say “Innovation is mandatory for organizations to survive in the high technology atmosphere of the 21st century. How to be innovative is a burning question for top management in the world today. Most organizations are looking for ways to improve their ability to create ideas and to develop the best environment for idea creation. More organizations are turning to the practice of knowledge management for sharing experiences and expertise, integrating knowledge, and generating new knowledge. What organizations need is a better understanding of how knowledge management is related to the innovation process and how it can be used to help foster innovation within organizations. Authors develop an eco-innovation working model taking relationship between knowledge management and innovation into account with a view to assist organizations in building innovative qualities and knowledge management practices into their business processes.

Goh, (2004), explains the transition from ‘information revolution’ to ‘knowledge revolution’ first and then goes on to explain why KM could enable knowledge innovations to flourish stating how information and communication technologies
(ICT) could be exploited for this purpose. The author developed a strategic management framework for leveraging knowledge innovation (KI) by providing practical considerations on knowledge-centred principles, knowledge-sharing infrastructures and knowledge-based initiatives and outlined the future challenges for organisations to exploit the benefits of knowledge innovation.

According to Amidon, (1997), innovation strategy for the knowledge economy is intended for managers who have practiced the best of quality and re-engineering management techniques and are ready to transform their organizations with the systematic notions of knowledge creation and application. It is for organization leaders who prefer to be inspired with innovation strategy than hit over the head with change management techniques. It does not deal with barriers, hurdles, or conflicts to be resolved; rather, it paints a possible vision of how we can take advantage of our collective learning to move an enterprise forward. He provides a sound, practical framework for instituting innovation strategy beyond the traditional definition of flow of parts or finances. At the core is an understanding of the dual value of knowledge (content) and innovation (process) using 'real-time' learning as the methodology. She introduces new managerial concepts such as: Value-System versus Value-Chain Strategic Business Network (SBN) versus Strategic Business Unit (SBU) Customer Success versus Customer Satisfaction.

2.11. Importance of Size of Organization:

Morgan and Hedgepeth, (2003), explore some of the current concepts, information sources, and various issues surrounding Knowledge Management systems application, and identify potential reasons why KM is failing to deliver the promised, expected results and purport that concentrating on a single Knowledge Management approach, excluding other methodologies, is not an effective approach. To avoid the wrong path down the Knowledge Management system implementation process, the company must first become focused in its approach. The ultimate KM system must become part of the organization's normal working process rather than a special function. Failing to plan, focus, and integrate the process as part of the company normal routine results in lost time, effort, and money. To be successful, the firm must understand its
core business strategy, understand what it doesn't know, develop a process approach, and allow adequate funding.

2.12. **Environmental factors for knowledge transfer:**

Ladd & Ward, (2002), while trying to establish a correlation between organizational culture and the ability of an organization to efficiently and effectively transfer knowledge they found that organizations with cultural traits exhibiting an openness to change and innovation as well as a task-centered orientation tended to be conducive to knowledge transfer. They are of the opinion that managers, if they can accurately assess the culture of their organizations, these leaders can attempt to institute changes to make their concerns more conducive to knowledge transfer.

Rampersad, (2002), state that an organization is more successful if its employees learn quicker, and implement and commercialize knowledge faster than the workers of the competition. An organization that does not learn continuously and is not able to continuously list, develop, share, mobilize, cultivate, put into practice, review, and spread knowledge will not be able to compete effectively. That is why the ability of an organization to improve existing skills and acquire new ones forms its most tenable competitive advantage. He introduced a knowledge management quick scan to measure this ability by framing about fifty statements covering aspects like general management, leadership style, strategic vision, internal processes and human resources which act as knowledge management audit and to be answered on a four point scale. The score obtained out of total 200 will determine the alignment of the organisation towards Knowledge Management. Higher score obtained, closer to 200, is related to a learning organization with a large learning ability.

2.13. **Importance of effective documentation and retrieval process:**

Ravichandran & Shareef, (2002), highlight the experiences of SSI Technologies on the implementation and quantitative benefits derived using a tool based process database for Knowledge Management in a project context. Only effective documentation and retrieval process can ensure long-term success for any organization.
For a software product to survive in the market, it must be maintained and upgraded constantly to keep pace with ever-changing demands. A software organization must respond to customer requests quickly, to keep the customer satisfied. Along with this, Information Updates, Removal of Resource Dependency, Transparency of Information, Loss of Knowledge also need to be addressed.

The bottlenecks are Distributed Information, Scarcity and inconsistency of documents, Voluminous Documentation, Information Sharing.

To have on-line corporate memory, one needs to have a Process database where knowledge resides in a centralized database rather than extracted through interactions with peers. Introduction of this process overcomes cultural barriers within an organization, which hinders sharing of knowledge. Then the process of sharing and make information available to all needs to be automated, creating a Corporate Memory knowledge bank (Process database). The process starts with collection of information, documentation in the centralized repository, entering of all technical information in the database both for new as well as for modified design and the documentation unit using the same information to produce final support documents such as user manuals, installation guide, etc. Entire information is collected in ASCII format, which is universally compatible and occupies less space.

2.13.1. Role and importance of Intranet:

Hingston, (2001), underlined the importance of intranet. In June of 1999, as part of its Knowledge Management initiative Rio Tinto, one of the world’s leading mining companies, (with its operations in the USA, Canada, Argentina, Colombia, Brazil, UK, Norway, Portugal, France, Austria, Italy, Sardinia, Zimbabwe, South Africa, India, Indonesia, Australia and New Zealand and employing over 30,000 people world wide, in addition to contractors, and has annual gross turnover of around US$10bn.) commissioned an intranet web site on safety issues. It turned out to be a very successful vehicle for sharing learnings from safety incidents, collecting and sharing statistics on safety performance throughout the group, and communicating safety policy and standards. Subsequently it was expanded to other aspects of Rio Tinto’s operations.
2.13.2. Languages and coding:

McKinlay, (2003), examines the relationship between languages and attempts to codify and manage business knowledge. Author further argues that the tacit/explicit distinction is not the salient issue for knowledge modellers. Other issues seem more concerning like a dichotomy of developments in modern logic in the 30s and 40s, the distinction between logical syntax and natural language and issues arising out of the translation and reduction of natural language.

2.13.3. Importance of KM and architecture of KM systems:

Kim, Lim and Mitchell, (2004), go on to state the importance of KM and present a method for building the knowledge requirements which are the architecture for the effective KM systems. The method is decision making oriented. The rationale of the method is introduced first. Then, the notations, grammars and processes of the method are presented. Further, the method is applied to building a knowledge model for a shipping company.

2.14. Models that help derive solutions

Srinivasan and Horowitz, (2004b), further contend that using models to help derive solutions for knowledge management in a large organization can take on many forms depending on the: 1) type of modeling output desired (predictive or explanatory model), 2) variable(s) being modeled, 3) variables input into the model, 4) nature and magnitude of relationships between output and input variables, 5) nature and magnitude of relationships between the output variables themselves, 6) nature and magnitude of relationships between the input variables themselves, 7) nature and magnitude of relationships between output variables and error terms, and so on.

2.14.1. Viable KM system model:

Leonard, (1999), contends that individual and organizational knowledge is difficult to value and therefore difficult to manage and hence looks at the management of knowledge from the perspective of the individual, the network and the organization using Stafford Beer’s Viable System Model, a powerful descriptive and diagnostic tool to map management capacities and promote viability.
Estimating the value of an organization's knowledge and intellectual capital is not straightforward either. Some can account for substantial assets in the form of documented intellectual property such as patents, trademarks and copyrights, which can be legally protected. For others, their knowledge assets are in people, processes, infrastructure, customer knowledge and culture. Although some describe the value of an organization's intellectual capital in terms of the difference between book and market value - that assessment is necessarily an aggregate and provides little guidance on its management. Depending on the business environment, the values of long term investments and potential liabilities may not be apparent. Nor does the presence or absence of general strengths such as strong shared internal values necessarily make a difference until the organization hits a turbulent patch.

For most individuals, integrating and managing the knowledge and information needed to perform effectively is a challenge. Networks and organizations also have the challenge of maintaining continuity and identity over time - sometimes with minimal infrastructure. They too must integrate and manage their knowledge and information and their exchanges with their environments to perform effectively. Continued viability depends on it.

Complex system viability was maintained by engaging in different activities, keeping them from interfering with each other, managing them together, focusing on the future and doing so in the context of an identity within which the interests of the whole over time could be considered. This is how the human nervous system works, and how successful collective enterprises work too.

The Viable System Model (VSM) labels these management functions Systems One through Five, and they are repeated at different levels: the individual, the work group, and on to each successive category as long as it remains relevant.

The VSM has been used to both diagnose existing organizational structures and to design new ones. It also provides a useful template against which to consider alternative structures and new challenges the system is facing, like integrating its internal and its external knowledge or monitoring the evolution of its identity in a changing market.
2.14.2. Publish-Subscribe Paradigm as A Knowledge Transfer Tool

Fernandes & Raja, (2000), say that the key to survival in today's chaotic business environments is the adaptive Computer Integrated Enterprise (CIE). Knowledge Management System (KMS) is a sub-element of the CIE and the main concern with a KMS is to make the captured knowledge available over cross-functional boundaries. What methodology can be used to make this possible, so that people that are not computer specialists can use such systems?" Such a system can be achieved through Object Technology (OT). The first step in distributing objects in the CIE is opening channels of communication between remote objects, and that this can be achieved using Publish and Subscribe technology.

There are two approaches to knowledge management. These approaches are based on how people define the term "knowledge". These approaches seem consistent among both KM-vendors (researchers and consultants) and KM-users. The first approach is the Management of Information (MI) approach. Researchers and practitioners in this field tend to have their education in computer and/or information science. They are involved in construction of information management systems, AI, reengineering, group ware etc. To them Knowledge can be defined as objects that can be identified and handled in information systems. This track is new and is growing very fast at the moment, assisted by new developments in IT.

The second approach is the Management of People (MP) approach. Researchers and practitioners in this field tend to have their education in philosophy, psychology, sociology or business/management. They are primarily involved in assessing, changing and improving human individual skills and/or behaviour. To them Knowledge is a process, a complex set of dynamic skills, know-how etc., that is constantly changing. They are traditionally involved in learning and in managing these competencies individually - like psychologists, or on an organizational level - like philosophers, sociologists or organizational theorists (Sveiby 2001). Publish-Subscribe Methodology (PSM) is based on the MI approach to achieve a knowledge transfer system that is focused on the power of encapsulation, inheritance and polymorphism of Object Technology involving assimilation and exhibition phases. The assimilation phase is essentially conceptual and oriented towards the creation of objects, whereas the second phase is more operative and technology dependent.
Assimilation aims at providing an abstract, expressive, and rigorous representation of the considered process to determine the objects. In this phase, it is important to look at the whole system, to identify its objects, and to understand how the different subsystems will have to cooperate to achieve their goal. The assimilation sub-phases are object representation and data assimilation.

This phase shifts the assimilation phase into the software domain, and it includes representation of data, and communication and exhibition of data. The exhibition role performs these tasks.

- Listen for reports based on categories.
- Receive canonical-form reports.
- Display the reports to the user.

Each user runs the same program, but receives a different subset of reports by subscribing to a different set of categories. Each report carries information in only one direction - from the transmitting objects to any number of users. The assimilating programs do not receive any information from the users.

2.14.3. CRM adoption as a part of KM efforts:

Goh, (2005), examines the issues relating to the challenges of Customer Relationship Management (CRM) adoption. By developing a diagnostic methodology, based on the Siebel Systems Value Diagnostic to propose an assessment framework, and evaluates six functional areas (sales, service, marketing, employees, partners and integration) using four levels of adoption as the ranking protocol. In conclusion, the methodology evaluates an organisation's state of CRM adoption as part of organisation-wide KM efforts.

2.14.4. Knowledge Management interventions and principles to address performance problems:

LaMonica, (2001), examines a national organization, DPA, (D. P. and Associates, Inc. (DPA) Training Services, which specializes in the analysis of military aviation training requirements and the production of computer-based training solutions) and makes a case for applying Knowledge Management interventions and principles to address performance problems.
In the Information Age, managing knowledge has become a necessity. But it isn't as easy as it sounds. Knowledge Management is not clearly defined or accepted in all circles, nor is it a panacea for all organizational woes. Targeted toward specific knowledge problems, however, Knowledge Management can be a powerful performance improvement tool.

2.15. Failure Factors in KM:

Weber (2007), described a knowledge management (KM) approach conceived from countermeasures targeted at addressing failure factors suggested in the literature. In order to counteract failure factors, the approach combines the technology of knowledge-based KM systems, with the flexibility and understanding of knowledge facilitators, and the processes of the target community.

In the KM system, the approach uses knowledge engineering concepts to represent knowledge artefacts and to enforce managerial responsibilities. By imposing a strict representation format, the approach guides and helps users. It does so by determining what knowledge to contribute, by enabling knowledge collection, and by representing knowledge. The purpose of knowledge facilitators is to complement the limitations of the computer-based component by verifying the quality of submitted artefacts and by motivating members to adopt the system. The design and operation of this approach is guided by identifying the processes of the target community and the level of specificity where they are useful. The importance of this contribution is that it offers guidelines to design a KM approach that relies on conclusions from published literature. In addition, it also proposes a means to validate knowledge sharing. A conclusion of this work is that it may be easier to address failure factors of KM approaches when all members of the target community have the same technical goals, are motivated by a common interest, are organized on a flat hierarchy, and are receptive to innovation. In addition, the use of a representation of the community's processes helps standardize capture, guide contributors, and associate existing with new artefacts. This association of artefacts can be used to validate knowledge sharing.
2.15.1. Failure Factors of Implementing KM Systems:

Akhavan, Jafari and Fathian, (2005), put forward few answers as the reasons for failure of knowledge management implementation efforts. Knowledge management systems fail because of two broad reasons.

First, knowledge management systems are often defined in terms of inputs such as data, information technology, best practices, etc., that by themselves may be inadequate for effective business performance.

Second, the efficacy of inputs and how they are strategically deployed are important issues often left unquestioned as 'expected' performance outcomes are achieved, but the value of such performance outcomes may be eroded by the dynamic shifts in the business and competitive environments.

Ambrosio, (2000), cites that the most common error in implementing knowledge management system is failing to coordinate efforts between information technology and human resources. Starting with a low-profile project, not changing the compensation scheme to reward teamwork, building the grand database in the sky to house all company's knowledge, and assuming someone else will lead the change are the other common errors during knowledge management implementation in the organization that cause failure in KM efforts.

2.15.2 Roadblocks and failure factors of KM:

Fontain and Lesser, (2002), identify a number of roadblocks that organizations typically face when implementing knowledge management programs. These roadblocks are:

- Failure to align knowledge management efforts with the organization’s strategic objectives.
- Creation of repositories without addressing the need to manage content
- Failure to understand and connect knowledge management into individuals’ daily work activities
- An overemphasis on formal learning efforts as a mechanism for sharing knowledge
Focusing knowledge management efforts only within organizational boundaries.

The ten most important failure factors of knowledge management system implementation are summarized below:

1. Lack of familiarity of top management with dimensions of KM and its requirement
2. Selecting an unsophisticated and inexperienced person for leading KM team
3. Improper selection of knowledge team members
4. Wrong planning and improper forecasting for the project
5. Lack of separate budget for knowledge management project
6. Organizational culture
7. Lack of support and commitment of top management
8. Resistance against the change
9. Inability of KM team for distinguishing organizational relations
10. Nonconformities between current systems and new systems

2.16. Is KM a fad?

Fotache, (2005), examines the intricacies of KM and tries to find whether it is another fad like so many fads desperately demanded in management theory or like few buzzwords the management would like have; such as here are some buzzwords heard over the last three decades: strategic planning, competitive forces, SWOT (Strengths, Weaknesses, Opportunities and Threats), Quality Circles, Total Quality Management (TQM), Learning Organization, Business Process Re-engineering (BPR), KM, Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), Supply Chain Management (SCM) etc.. It also examines to what extent is KM technology, management, sociology and other social sciences related.
2.17. Identified gaps:

The above review of literature brings following points to the fore where the research work done so far either seems insufficient or not much has been done at all. The first thing that comes to mind is that in the area of steel industry there seems to be very little research work done. KM has been implemented at some important and major steel plants in the world like Mittal Steels, Nucor Steels, and at the country level, Tatasteel, Visakhapatnam Steel Plant and Bhilai steel Plant but by and large the industry did not introduce the same. Besides, almost no research work was done pertaining to this field.

While knowledge management process has been much discussed, these process approaches have some limitations. Knowledge management activities are only analyzed from the view of knowledge life-cycle and focused on the design of KM systems. This causes a confused understanding of knowledge management activities where as the requirement is integration of knowledge management activities and business processes in such a way that it is clear to all and plausible to follow and implement.
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