

Knowledge Management-Theories, Issues and Challenges

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Introduction

Firms have always been oriented toward accumulating and applying knowledge to create economic value and competitive advantage and the need to do it has never been more. In this context, knowledge needs to be made more visible and tangible; yet the very ambiguity and intangible nature of tacit knowledge makes that a challenge and brings out the paradox elements of Knowledge Management.

Tacit knowledge is often more valuable as a source of uniqueness and competitive advantage but it may or may not be observable in use, it may be complex or simple and it may be an element in a system or an independent factor (Winter, 1987). There is an additional complexity that tacit knowledge carried by individuals only reaches its full potential to create economic value when embodied in organizational practices that is when it is more explicit. But this conversion process or flow is neither automatic and easy nor replicated easily (Nonaka and Takeuchi, 1995). Many tacit, non-transferable, complex knowledge assets (Winter, 1987, Teece 1987) have strategic value, yet if they are not measurable and tradable, then how can they be valued? But in spite of this normative emphasis on Knowledge and its management (Grant, 1996); (Gupta and Govindarajan, 2000), few studies and practically none in this part of the world have been done to establish empirical linkage between Knowledge and Business performance or how the knowledge advantage can be sustained and renewed (McEvily and Chakravarthy, 2002).

Interactive and Networked computing encourages companies to link employees and business process partners across geography and time zones and many firms are lured by the buzz of 'hard technology' but the gap between 'data warehousing' and 'Knowledge Creation' can be large without proper research and understanding of the more ambiguous realm of restructuring social relationships and changing nature of 'psychological contracts' in Indian organizations.

It is necessary but perhaps easier to create a unified 'customer database' and then to 'slice and dice' it for better market segmentation and targeted, efficient campaigns. But it needs an array of multidisciplinary inputs to be able to use that 'information and insight' to reorganize organizational routines for innovative and sustained excellence to produce world class products and services.

While informal mechanisms for the effective conversion of information into knowledge may limit wide dissemination, formal procedures packaged in powerful information technologies often inhibit learning. Information technology tools (and there are many research opportunities in exploring their indigenous derivatives) can vastly improve the efficiency of moving information from 'one head to another' (Cole, 1998) and such KM activities can pick the 'low hanging fruits' like technology mapping, patent search, collaborative design, business process acceleration, and mining of 'ill-structured' contents.

Yet much wider (multidisciplinary) and deeper (empirical, longitudinal, multi-criteria) research will be needed to unravel the tapestry linking individual cognition, knowledge, learning and Organizational Learning and innovativeness or as to how knowledge absorption and the process of recombination can be enhanced for bridging the complex gap between knowledge and action.

The Business Challenge

The key business challenge in the new economy is

- ... to deliver
 - a wide array of products
 - with value added services
- ... to customers who...
 - want trusted partners not just vendors
 - expect responsiveness
 - demand global execution
- ... in an Industry where ...
 - time to market is key
 - innovation is a table stake
 - competition is diverse and fierce
- ... through ...
 - a very large and dispersed organisation
 - having hundreds of partners
- ... achieving ...
 - continuous growth
 - sustained profitability

Key issues/Areas of research/applications of KM in Indian organisations

Two dominant streams of research/applications of KM may be identified:

1. Role of Information Technology and Artificial Intelligence in organizational processes: This requires a strong contribution from computer scientists and artificial intelligence researchers in particular. It deals with the areas of intelligent agents, ontologies, and computer-mediated collaborations.
 - 1.1 Role of IT and development of organizational memories and intelligent databases: Data and knowledge management research is focused in cooperative and intelligent database/information systems, distributed data systems and data and knowledge base systems integration. Technologies of relevance to these research areas include database modeling and design, query languages, knowledge representation planning and problem-solving, information retrieval, integration and interoperability of heterogeneous data/knowledge bases. Corporate memories (also known as organizational memory or organizational memory information systems) are used for enhanced decision making. A corporate memory embraces all forms of institutional knowledge, whether formally encoded within the current information systems, or tacit (informal) knowledge used by individuals in professional practice.
 - 1.2 Applications of AI, neural networks and evolutionary algorithms: Artificial Intelligence has emerged as the core technology for knowledge representation and is now the key to knowledge discovery, automated taxonomies and collaboration around competencies to the new practice of knowledge management. Databases with millions of records and thousands of fields are now common in business, medicine, engineering, and the sciences. The problem of extracting useful information from such data sets is an important practical problem. Probabilistic and statistical techniques in particular, play a key role in both analyzing the inference process from a theoretical viewpoint and providing a principled basis for algorithm development. Intelligent data mining techniques are required in recognizing behavioral patterns of people within organizations, consumers, buyers and suppliers in the market. Increased complexities of data create the need for and applications of neural networks and evolutionary algorithms for efficient

data

mining.

2. Insights into the theory of knowledge, the knowledge of the firm, organizational culture, measurement of intellectual capital and learning organizations.
 - 2.1 Role of cognitive and social sciences in organizational learning: Cognitive sciences help to design knowledge management solutions such that it fits smoothly with the cognitive capabilities of the people involved and is optimally embedded in their work context. Organizations as well as researchers still know very little about the favorable circumstances that stimulate people in organizations to create, share or apply knowledge.
 - 2.2 Process of knowledge-action dynamics and the challenge of actualizing learning: Persuading knowledge workers to create, share and apply knowledge is a challenging task. Mere deployment of technologies at appropriate places is not enough, a good area of research then, is to redesign the knowledge work processes or modify them so that they channel the flow of knowledge in the right direction.
 - 2.3 Methods and instruments of knowledge and epistemology: Study of how knowledge is obtained and validated in a respective philosophical system is a major challenging area of research. Research into epistemology is needed to explore new methods for knowledge creation and bridge the gap between our knowledge and semantic information.
 - 2.4 Measurement of intellectual capital: The commercial value is more visible in companies that have traditional tangible values. Since beginning of the 1980s, the share of Intangible Assets of corporate market value, that is the amount of market value that is not reported on a company's balance sheet, has constantly increased from an average of 40% to over 80% at the begin of the 21st century. This also means that the traditional accounting methods does account for only about 20% of the total assets of a company.

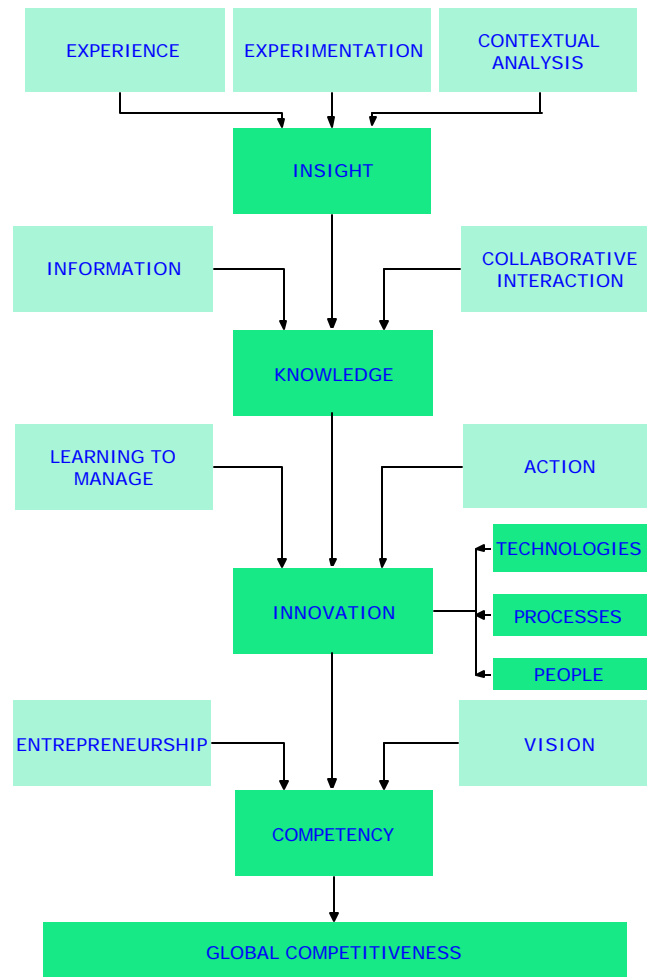
Correct evaluation of intangible assets is essential for a firm in order to keep track of, benchmark and build on its intangible assets. It also gives greater insights into a company's performance and provides for better explanations for the 'invisible balance sheet' for the accountants and financial experts by giving a true picture of the financial state of the firm. In the new economy, where most value is created through a new strategy (that means a unique combination of certain knowledge assets or other winning factors), through product innovation and relationship building with customers and business partners, the traditional accounting approach from the industrial age has to be complemented with additional insights and therefore with new tools. The traditional cost accountant toolbox is lacking in instruments for the systematic monitoring and optimization of external output factors, for example, network effects, sales partnerships, or user communities. Nowadays, these factors are just as important to the success of an enterprise as managing costs. In addition, to manage successfully product innovation projects in R&D requires more than just cost information.
 - 2.5 Evaluation of knowledge levels in an organization: Achieving KM success involves significant change - in terms of culture, process, and systems - within an organization. It is unlikely that this change can be achieved in one giant leap, and a staged framework is thus desirable. Various maturity models try to assess the current maturity level of an organization and provide a mechanism to focus, and help prioritize, efforts to raise the level of KM maturity. Development of highly models/metrics for accurate assessment of KM maturity level and providing a holistic quantitative and qualitative picture of Knowledge Management maturity level is still a challenge for KM researchers.
 - 2.6 Insights from chaos theory and complexity science: Building upon the theories of chaos, complexity science is the study of the properties, behavior and evolution of biological, computational, technological and economic systems (called 'complex adaptive systems').

Research into chaos and complexity can yield a set of practical applications for business which are far more expansive than the ones imagined so far.

2.7 The Learning Organization: Peter Senge (1990) defines a learning organization as:

“A learning organization is a particular vision of an enterprise that has the capacity to continually enhance its capabilities to shape its future”.

The concept of a learning organization is one in which learning is a continuous and cyclic, interactive process and global competitiveness is achieved by turning actionable knowledge into a fountainhead of innovative product/process. This in itself creates new avenues and drives for further learning. This whole process in a learning organization as a framework towards organizing Indian firms for global competitiveness is shown in the adjoining figure.



HOW KNOWLEDGE IN A LEARNING ORGANIZATION LEADS TO GLOBAL COMPETITIVENESS

Knowledge management draws from a wide range of disciplines and technologies: Cognitive science, Expert systems and artificial intelligence, Computer-supported collaborative work (groupware), Library and information science, Technical writing, Document management, Decision support systems, Semantic web networks, Data warehouses and networked databases, Fuzzy systems, evolutionary algorithms, neural networks, and chaos theory, Organizational science, object-oriented information modeling, electronic publishing technology, hypertext, and the World Wide Web, full-text search and retrieval(data mining and text mining, search engines), simulation and modeling, case based reasoning, video conferencing, intranets and the internet, indexing techniques, intellectual assets management and performance support systems.