An Affordable Approach to Knowledge Management (KM)

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ABSTRACT

Knowledge plays a key role in competitive success in any business today. Creation and effective utilization of knowledge is the only differentiation strategy through which an organization can achieve cost based competitive advantage. Organizations have started viewing their existing knowledge, which can be used and reused (Green Knowledge) as their key asset /capital. This paper tries to identify some key factors using a scientific methodology and attempts to propose a cost effective Knowledge flow / model through which companies can capture and customize their intangible assets or green knowledge and leverage them in an efficient and strategic way.

Keywords : Individual Knowledge, Organizational Knowledge, Declarative knowledge, Procedural Knowledge, Working Knowledge, Knowledge Management Units, KML, KMC, ESQ, CIQ, KMU, KMP, KMW.

Introduction

In this age of information and competition, knowledge is the key asset for sustainable success of any individual and/or organization. According to Chalmers (1991) "the goal of science is to produce / provide knowledge about the world". Therefore it's an activity that increases "the stock of useful knowledge", which could be used to leverage the business needs.

Our senses are triggered by many stimuli and the perception of these stimuli involves cognitive process, which in turn become the inputs for our memories and these memories form the base for current and/or future perceptions and actions (physical and mental). The interactional effect of perception and action results in what can be called the *individual knowledge*.

Organizations need to connect the individual knowledge of their members and apply it in their business value chain to create a value proportion to their core business in terms of revenue, good will and what not. So the combining of individual knowledge leads to the *collective and/or organizational knowledge*. Creating such a knowledge hub or knowledge base in an organization is a challenging task. Research says that 'Learning Organizations' are effectively managing their knowledge base (individual and organizational) through a systematic process.

$$O_K = \sum_{i=1}^{i=n} I_{Ki}$$

The Concept of KM

The term Knowledge Management (KM) was first coined by Karl Wiig and his fellow research group during the year 1986. There are many definitions for KM, some of them are

"…….the activities to create, capture, transform, and use ……" - Wiig. K.M (1997)

"…..documentation of best practices, success stories, failures, customer information, and like …." - Greco. J (1999)

"…..human and technological networks capable of harnessing a company's collective expertise and audience ….." Greengard. S (1998)

"….strategies and processes of acquiring, converting, applying, and protecting knowledge……" - Hsiu-Fen Lin (2007)

"…..process of creating, capturing, and using knowledge to improve organizational performance …" Bassi (1997)

"….process through which organizations generate value from their intellectual and knowledge-based assets ….." Gordon and Smith (1998)

"…the process by which an organization creates, captures, acquires, and uses knowledge …" Kinney (1998)

The above definitions are insufficient, because they restrict Knowledge Management (KM) only to a

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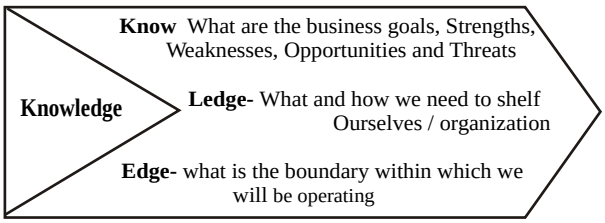
set of process. The term knowledge can be split and deciphered as:



Putting all these components together, "... *Knowledge Management can thus be defined as a business philosophy, principle and/or guidelines which help an organization to understand their business process (value chain) and ethically and legally leveraging on their existing knowledge (knowledge which can be used and reused) to meet their business goals.…* "

Knowledge is a Potential

Davenport.T.H and Prusak (2000) in their article "Working Knowledge" states that, knowledge has been described as information combined with experience, context, interpretation and reflection. The risky task before all business firms is to capture and manage the diverse set of knowledge (assets) in a productive way. Many organizations (including non profit organizations) had started to view Knowledge Management (KM) in a strategic way (Addicott, McGivern & Ferlie 2006).

A common issue faced by every organization is 'Resistance in sharing / disseminating / distribution of knowledge.' Knowledge sharing depends upon the interests / willingness of people. Wilson, T. D. (2002) in his book "The nonsense of knowledge management" asks: 'If getting promotion, or holding your job, or finding a new one is based on the knowledge you possesswhat incentive is there to reveal that knowledge and share it?'. Francis Bacon observed back in 1597 that 'knowledge is power' and Foucault (1980) argued that 'the production of knowledge and the exercise of administrative power interlink, need to be balanced ….' Since sharing of knowledge actually requires time, effort and cost, knowledge resistance has to be approached with that perspective.

A recent study from Sessi, CIS3 (December, 2002) identified that over the past years, companies had rolled out different aspects of knowledge management practices like *Knowledge Sharing Culture, Incentives Policy to Keep Employees, Partnerships for Knowledge Acquisition & Written KM Policy* to sustain the knowledge and to improve the company's productivity in long run in terms of competitive advantage. Further the study reveals that, Knowledge sharing was in the lead (28%) for the manufacturing companies and it is stated that they had a culture to promote knowledge sharing. Many companies had implemented incentives policy to keep the executives and employees stay in the firm (27%), thereby avoiding knowledge loss. Likewise, it can be seen that 23% of the companies forged partnerships or alliances for knowledge acquisition. The details of the study are shown in Figure 1.

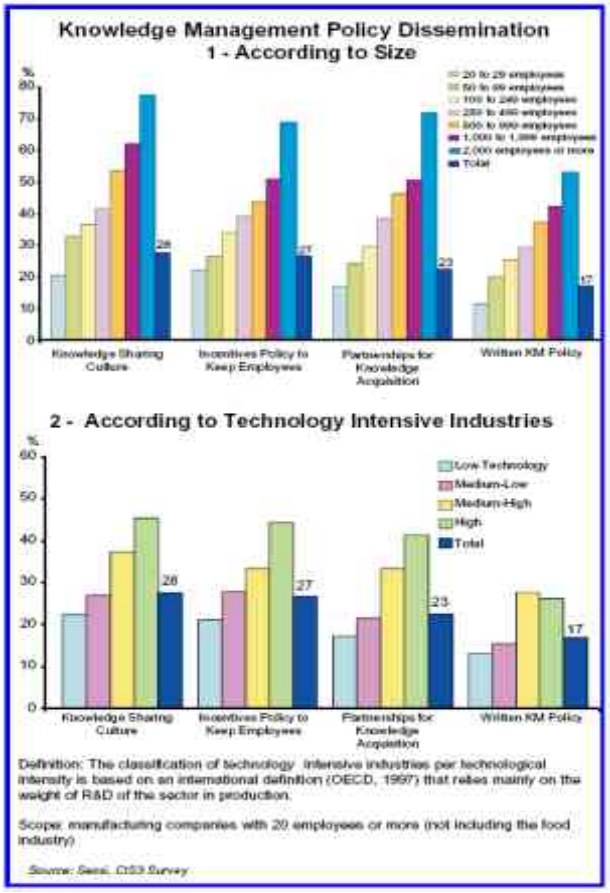


Figure 1 Sessi, CIS3 Survey

INFOSYS Approach to Cost Reduction:-

Faced with one of the economic downturns in recent times, organizations are focusing on cost reductions as never before in all areas. Infosys did a study to find a strategic way how to reduce the overall IT Budget cost. After analyzing different verticals on March 2009, Infosys identified a strategic model and proposed the possible outcome of the model along

with the percentage wise cost savings. Infosys revealed that there has been a reduction of IT budgets by around 1520 percent significantly in some specific cases. Infosys also believe that companies can reduce their overall operating cost by *reusing the existing information or Knowledge* which they have already used in some of their RFI (Request For Information), RFP (Request For Proposal), RFQ (Request For Quotation), etc. The proposed three stage model across verticals is shown in Figure 2.

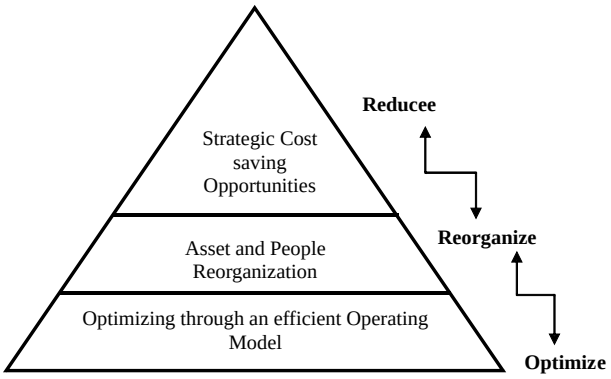


Figure 2 Infosys Cost Saving Model

The above model deals with the effective usage of existing information across the verticals and horizontals. This information can be retrieved only when the organizations implement a Centralized Knowledge Hub / Knowledge Management Portal. From this model it can be quite clear that 20-30 percent of cost can be saved by avoiding *Redevelopment Operating Cost*, 25-40 percent of cost can be saved in terms of *New Infrastructure & Management Cost*, 15-45 percent of cost can be saved in terms of the *Quality Assurance* and 10-30 percent of cost can be saved in terms *Overall IT Cost*.

Further from the above facts, it can be inferred that on an average 15-30 percent of the overall cost can be saved by just developing a Knowledge repository or Knowledge Hub. A.K Balyan, Director (HR), Oil and Natural Gas Corporation (ONGC) said to Business Standard on June 24, 2009 that they are planning to rope in Infosys, for setting up a Knowledge Management System (KMS). He also added that the initial investment will be around Rs. 50 Cr and the total project cost could be around Rs. 100 Cr.

Literature Review

According to Michael Polanyi's (1891-1976) the concept of knowledge is based on three main theses. Firstly, new knowledge cannot be accounted or discovered by a set of expressed rules or algorithms, secondly, knowledge is public and also to a very great extent personal, and thirdly, knowledge can be either *Tacit or Explicit*.

? *Tacit knowledge* is highly personal and hard to formalize and very difficult to share with others. Tacit Knowledge is deeply rooted in an individual's action and experience as well as in the ideals, values or emotions he or she embraces. Many Japanese view knowledge as being primarily tacit, something not easily visible and expressible (Ikujirio Nonaka & Noboru Konno, 1998).

? *Explicit Knowledge or Codified Knowledge* can be expressed in words, numbers and shared in the form of data, reports, books, scientific formulas, manuals, etc. This kind of knowledge can be readily transmitted between individuals either formally or systematically. Knowledge that can be expressed in words and numbers only represent the tip of the iceberg of the entire body of the possible knowledge (Ikujirio Nonaka, 1994)

Adaptive Control of Thoughts - Rational (ACT - R) is a general theory of cognition developed by John Anderson et.al and it is an elaboration of the original ACT theory (Anderson, 1976) and builds upon Human Associate Memory (HAM), a model of semantic memory proposed by Anderson & Bower (1973). ACT distinguishes among three types of Knowledge structures: Declarative Knowledge, Procedural Knowledge, and Working Knowledge.

? *Declarative Knowledge* corresponds to the things which we are aware, we know and usually describes to others (John R. Anderson, Michael Matessa and Christian Lebiere, 1997). Example: New Delhi is the capital of India; India got independence on August 15, 1947, “Three plus Four is Seven”, etc.

? *Procedural Knowledge* is the knowledge that is displayed in human behavior but of which we are not conscious. Procedural Knowledge basically specifies how to bring declarative

knowledge to bear in solving the problems (John R. Anderson, Michael Matessa and Christian Lebiere, 1997). In simple terms, it is the knowledge about how we do things such as cycling, how to drive a car etc.

? *Working Knowledge* is a long term knowledge which helps us to interact with the outside world. Working knowledge can be obtained through a cognitive process of both declarative and procedural knowledge.

NONAKA SECI MODEL

Ikujiro Nonaka and Hirotaka Takeuchi (1994) proposed a model of the knowledge creation process to understand the dynamic nature of knowledge creation and to manage such process effectively.

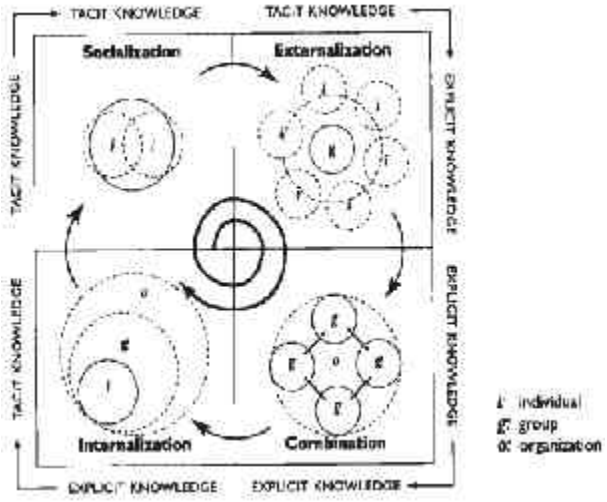


Figure 3 SECI Model

Source: Ikujiro Nonaka, 1994

Nonaka had developed four modes of knowledge conversion model from Polanyi's theory of knowledge creation. The four modes are:

1. Tacit Vs Tacit *Socialization* (e.g. Apprenticeship)
2. Explicit Vs Explicit *Combination* (e.g. Telephonic Conversation)
3. Tacit Vs Explicit - *Externalization* (e.g. Developing Concepts)
4. Explicit Vs Tacit *Internalization* (e.g. Mental Models)

From the above models it can be understood that the process of knowledge creation and different modes of knowledge and the ground at which the transition or process of knowledge take place. But in organizations Knowledge Creation or Knowledge Sharing depends on several internal and external factors.

Moreover, in an existing system, to retain the existing knowledge and/or to create a new knowledge, companies need to look into some critical factors which contribute to their KM success. This paper had put forth a dynamic model and identified some key factors which act as a place (Ba) for knowledge creation or knowledge sharing in a sequence and with a proven methodology.

Need for a New KM Theory

Theory provides a means for identifying the problem and approaching it in a strategic way. Theory provides a base line to align all factors or variables towards the business goals and objectives. According to Campbell (1990) there are three factors for knowledge management theory. They are:

? Defining Applied Problems

? Evaluating Solutions

? Responding to New Problems

Dubin's Methodology for Theory Building

Dubin's methodology has eight stages in which first four stages deals with the "Conceptual study" and the last four stages deals with the "Empirical or Research" of the theory. The stages are

1. Units
2. Laws of interaction
3. Boundaries ⟺ The ***theory development*** side of the Theory – Research cycle
4. System States

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5. Propositions
6. Empirical indicators of key terms
7. Hypotheses ⟺ The ***research development*** side of the Theory – Research cycle
8. Testing

The *units of a theory* are sometimes described as the concepts of the theory, or the basic ideas that make up the theory (Cohen, 1991; Dubin, 1978; Reynolds, 1971). The relationships among units of a theory are

described in the *theory's laws of interaction*. Dubin emphasizes that all the units and their variables in the theory should at least follow any one of the three laws given below:

1. *Categoric Laws of Interaction*: This law relates *variables* of *unit* Vs *variables* of another *unit*.
2. *Sequential Laws of Interaction*: This law relates *time dimension* of *unit* Vs *time dimension* of another *unit*.
3. *Determinant Laws of Interaction*: This law relates *determinate variables* of *unit* Vs *determinate variables* of another *unit*.

Based on the Dubin's methodology the critical factors (Units) in KM are identified and explained in Table -1.

The *boundaries of a theory* are established to determine and clarify the domain or area within which the theory is expected to operate and apply (Dubin, 1978). The *fourth step in the theory development* was to specify the *system states of the theory*. The system states represent conditions under which the theory operates. Three criteria identified by Dubin (1978), when identifying the system states of a theory are

1. Inclusiveness Refers to the need for all the units of the system to be included in the system state of the theory.
2. Persistence - Requires that the system states persist through a meaningful period of time.
3. Distinctiveness - Requires that all units take on measurable and distinctive values for the system states.

In an organization the Knowledge Management Flow / model (Figure-4) exists and/or operates within the open boundary and closed boundary, and in both these boundaries the variables

Table 1. KM Units

Knowledge Management Leadership -	KMLLeadership is a self-driven factor for all initiatives in the firm. The firm's business strategies and goals need to be aligned with the KM process and KML plays the major role to bypass the things.
Knowledge Management Culture KMC	KMC means an organization that offers opportunities to create knowledge and one that encourages learning and the sharing of what is learned.
Existing Information Quality EIQ	Information quality of various kinds, including the relevance, applicability, accuracy and so on.
Existing System Quality ESQ	System Quality includes accessibility of relevant information's from anywhere, at any time to leverage the business needs.
Current Information Quality CIQ	The improved version of EIQ which deals with the updated information's, applicability and so on. The gap between EIQ and CIQ will be bridged by KMP
Knowledge Management Users KMU	Assessing the knowledge sharing within the relevant / peer group and satisfaction with the access thereof.
Knowledge Management Process KMP	Process is composed of several steps to clearly identify what should be measured, how to measure it, and how to use the measures in an efficient and productive way.
Knowledge Management Workers KMW	Each & Every individual of an organization who involve themselves in KMP.

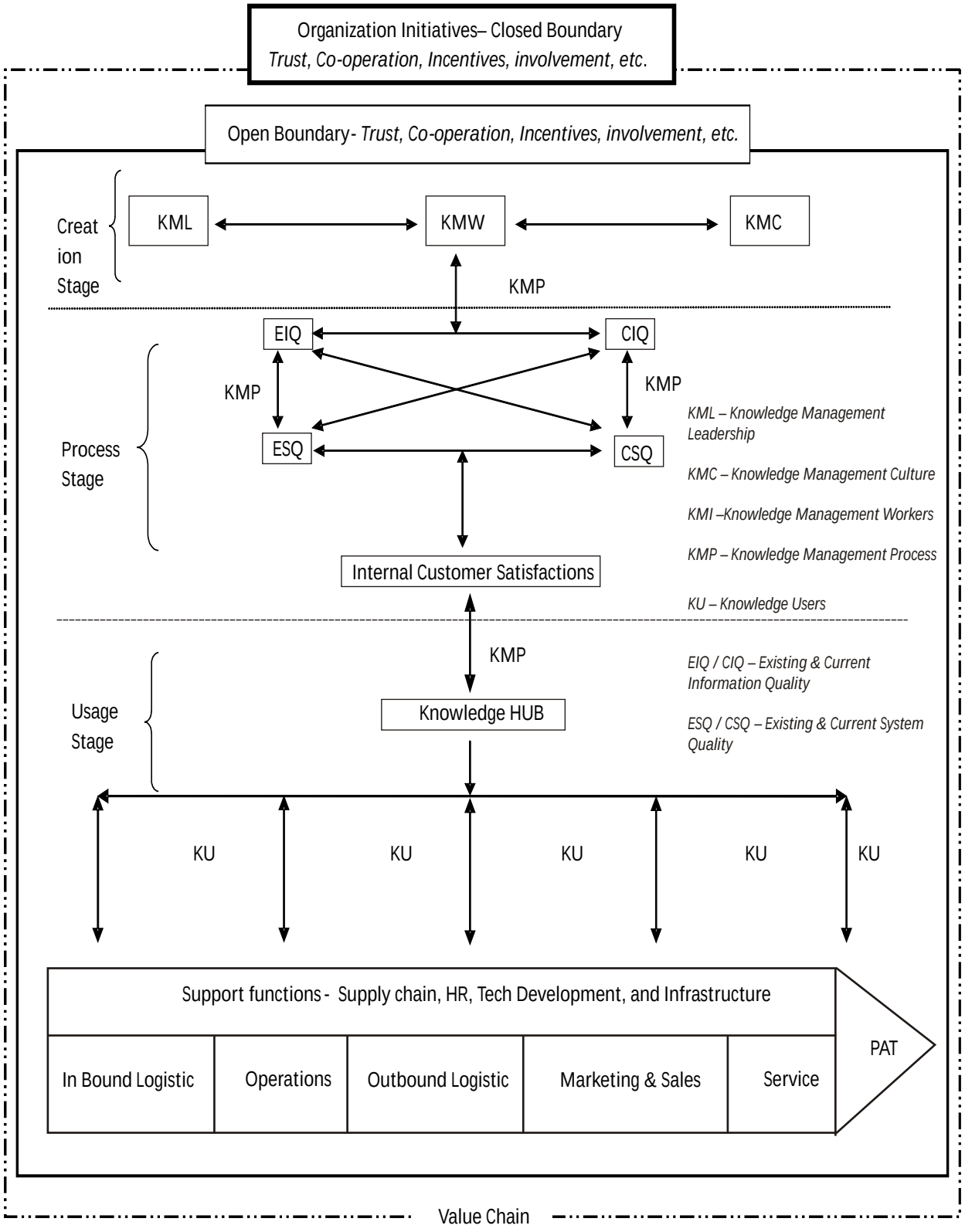


Figure 4 Knowledge Management Flow

like trust, co-operation, involvement, incentives (appreciation), are considered to be the base variables. The organizations while operating need to give importance to these variables and should incorporate these in their value system. This shared value systems becomes the base / input for a better culture in an organization. In an organization leaders create culture and inspire others to follow it and sometimes culture can also create leaders. When this firm platform for a culture to develop efficacious leaders and/or leaders building in a strong culture would enable learning and sharing in an organization and thus will create a synergistic system which is ready to transform itself into a knowledge based system.

Stage 1 *First Stage or Creation stage*

The effect of culture & leadership creates a transparency in the process and this transparency is the initial success for converting the normal workers to knowledge workers. The ideas generated by the employees either from within the company or from outside, needs to undergo a process, and this is done in order to standardize the ideas generation / ideation and conceptualization process. This is the stage where the organization as a whole acts as a Brahma (one of the trinity in Hindu mythology responsible for creation) in synthesizing information to become raw knowledge that needs refinement and further to be made actionable.

Stage 2- *Second Stage or Process stage*

The processed information from the first stage are captured, processed and customized as per the requirements and needs of the organizations. The process should be followed throughout the organization, so that all existing information is utilized effectively and also to ensure that there is no loss of information and the main purpose is to align the entire process / system with the vision and value system of the organization. Once when this knowledge process is standardized then it's left to the user group to utilize it effectively. In this stage the standardized and value driven process / system is in place and it remains the responsibility of the users in keeping it integral by following the system conscientiously / to make it more better by using and re-using the existing knowledge in different places. This stage is almost like the function of Vishnu (one of the trinity in Hindu mythology responsible for preserving / protection).

Stage 3 *Third Stage or Utilization stage*.

This stage can be viewed under two levels: Internal and External. Here the knowledge utilization and value creation process involves both the push and pull mechanism. The new knowledge generated within the company is translated to satisfy customer requirements and/or bring in customer delight. On the other hand the available data on customer requirements are decoded / converted to information followed by making it actionable (converting into knowledge) resulting in business activities focused on customer satisfaction /delight, throughout the entire value chain. This stage can be equated to the function of Shiva (one of the trinity in Hindu mythology responsible for destruction). Destruction here is about letting go of the older knowledge and /or creating a completely new one or by reusing the older knowledge and creating a new one by looking it with a new perspective. So here, the creation process (Brahma) comes in as a finish-to-start with the utilization / destruction stage (Shiva).

Knowledge Management Culture KMC

Culture is the first unit in this model and it can be defined as “desires, end goals, and customary practices of the Industry or organization”. In addition, culture is the set of commonly-held beliefs and assumptions within an organization (Balogun & Jenkins, 2003).

Every company or organization has its own specific culture and therefore it's their unique practices (Schein, 1984). Just as organizational culture influences the actions and communications of everyone in a company, KMC can also be a powerful tool to influence on how companies can manage their used knowledge in an effective way. The proposed KMC is represented in the Figure 5.

Key Result Area (KRA) Key Process Area (KPA)

Figure 5 Proposed Knowledge Management Culture

An effective corporate culture that would pilot KMC consists of norms and practices that promote the free-flow of information among employees and across department lines. Organizational culture differ from KMC in many ways, and they are briefed below in Table- 2

Organizational practices include even the small (but a crucial task) of how people answer a phone call and how they respond to a query. Incentives system is also one of the measurable practices used by the management to help employees to accomplish the organization's goals (ultimately their goals as well). If the system / practice do not promote the free transfer of knowledge within an organization, then the prevailing culture would be a great barrier for KMC.

Managers are becoming more aware of the problems created by having a corporate culture inconsistent with KM programs. A study conducted by the *Journal of Knowledge Management* revealed that organizational culture was one of the largest obstacles faced by the managers to implement KM programs. This study (Dr. Kristen Bell DeTienne et.al, 2004, p29) was conducted among 431 senior managers across different industries, out of which 80 percent of the respondents said that the culture of their organization in some way "hindered the development and introduction of KM strategies and programs". Thus, suggesting that an organization culture which is not aligned with the KM process will be a major problem in implementing KM programs. In fact, it could be the largest obstacle faced by companies in KM programs (De Long & Fahey, 2000).

Knowledge Management Leadership - KML:

Leadership is the second unit in this model; leaders have a direct impact on the Knowledge Management Culture and on how the company approaches and deals with managing their knowledge. A recent study of 431 U.S. and European organizations found that 67 percent of the respondents unanimously agree that their foremost obstacle to implement or practice Knowledge Management is "Culture" and they believe the obstacle can be removed by committed top management (Ruggles, 1998).

Stewart (1997) argues that even companies with efficient cultures and promising highly effective incentive programs will not succeed without dedicated and responsible managers. Interestingly, many researchers and professionals are now realizing that if firms wish to have such a managers who are dedicated to achieving KM goals and who are prepared to do what is necessary to achieve those goals should be trained and add them in the value list of the organizational data base. Developing such leadership

Table 2. Organizational Culture Vs Knowledge Management Culture

Parameters	Organizational Culture or Industrial Culture	Knowledge Management Culture KMC
Focus	Product / Financial	Costumer / Market
Risk	Risk Averters	Risk Seekers
Information Flow	Low	High
Management Level	Many	Few
Responsibility	Unshared Responsibility	Shared Responsibility
Application or Concept	Rule based	Principle based
Organization Structure	Structured	Unstructured
Training	Occasional	Continuous (i.e. Learning Organization)
Measure	Efficiency	Effectiveness

will certainly requires investment of both time and resources but the benefits or ROI will be marginally high .One such investment that companies have found beneficial is appointing Chief Knowledge Officer (CKO) or Chief Information Officer (CIO).

Kluge, Stein, and Licht (2001) points out that leaders across all levels of the organization have unique role to play in managing knowledge, particularly the CEOs since they set the boundaries (Policies, Procedures, Values, etc) for an organization. Therefore, he or she decides whether the KM should be a companywide or not. If the top management looks at KM as a strategic tool for business growth, the importance of KM cascades down to all levels.

Takeuchi (1995) in his work describes three way process by which the organization's top management can provide a clear direction about KM.

? First, CEO should give his stand on companies Business Process and top managers must articulate a 'grand theory' of what the company as a whole.

? Second, top management must incorporate its vision for knowledge management into the company's corporate objectives or policy statement.

? Third, top managers must strategically decide which KM efforts to support and develop and then must follow that strategy.

By performing these actions, Takeuchi argues, the organization's leadership will not only link different activities of the organization but also brings a single focus point on the objectives and carryout thereof for the next level.

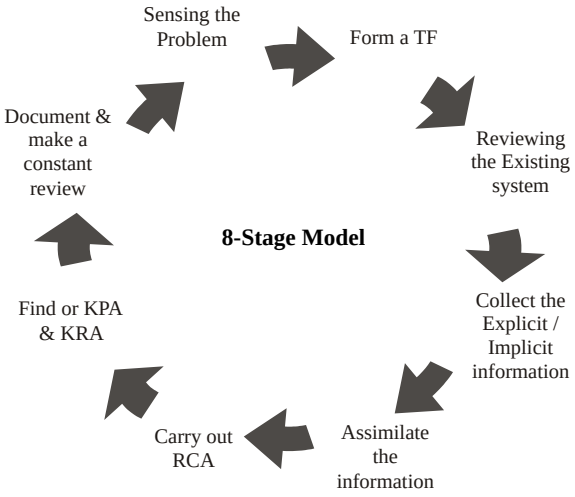
Knowledge Management Process (KMP):

There are many strategies and techniques to capture the scattered knowledge and make it readily accessible to all. A KMP may look simple in principle but the effectiveness of the process can be judged in three ways:

1. Depth of Analysis or depth of the content
2. Time constrain or Lead time
3. Degree of accessibility

Basic Knowledge Management Cycle - 8 Stage Process model:

The transforming of information into knowledge involves a synergic effect and this effect should be developed by the top management with the work team. New knowledge should be rapidly developed and made accessible to the focus group. In order to patch up the time constraints, companies need to follow a cyclic process as shown in the Fig.6



TF- Task Force Team RCA-Root Cause analysis

Figure 6 Basic Knowledge Management Cycle or 8 Stage Process model

Thus, KM process represents a collection of initiatives rather than a single project. An organization can succeed by developing capabilities continuously and transforming it to a useful or re-useful material which can be used for other projects. But important strategies of KM process are

? What knowledge to acquire?

? How to acquire it?

? What is to be created out of it?

? How it can be an internal valuable asset?

Conclusion

"*Men who cannot communicate their knowledge to others;*

Resemble a bouquet of unfragrant flowers in full bloom" (Thirukkural - Verse 650).

So, to stay competitive, companies must find effective ways to leverage the knowledge that exists within their own organization. This paper has tried to highlight the importance of knowledge and the process to handle that knowledge in an effective way.

Secondly, this paper has identified and applied scientific process and/or a proven methodology (Dubin's theory building methodology) to find out the factors or variables or units which affects the knowledge Management and this effort would be furthered in the future towards building a new KM theory.

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