Knowledge Sharing in Software Industries

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ABSTRACT :

Knowledge sharing is a key component of an organization's knowledge management Software development is often considered to be an intense cognitive activity that requires collaborative problem solving. Knowledge sharing in the Information Technology (IT) industry can be the key in organizational effectiveness. An attempt is made here to understand the need for Knowledge Management and Knowledge Sharing in software organizations. The paper also examines the role of knowledge network in promoting knowledge sharing within software organizations.

KEY WORDS : Advantages, Organization, Strategies, Information Technology, Software.

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I.   INTRODUCTION

Knowledge Management (KM)s plays an important role in maintaining sustainable competitive advantage of organizations in this era of knowledge driven economy. Managing knowledge resources is one of the key functions in modern organizations (Johnny and Bolloju, 2005). A study reported that about 80% of companies in Europe consider knowledge to be a strategic asset (KMPG, 2003). KM involves people, technology and process, all working in cohesion to achieve strategic business goods.

From an individual perspective, knowledge is defined as a justified belief that increases an entity's capacity for effective action (Huber, 1991 and Nonak, 1994). In the organizational context, KM refers to identifying and leveraging the collective knowledge in an organization to help the organization to compete (Von Krogh, 1998) Johnny and Bolloju, 2005) point out that KM aims at managing individual employee's knowledge for increasing organizational's benefits. KM was introduced to the business world to help organizations create, share and use knowledge effectively Nonka and Konno, 1998) defined KM as a method for simplifying and improving the process of sharing, distributing, creating and understanding company knowledge. According to Montana (2000), KM focuses on systematic and innovative methods, practices and tools for managing the generation, acquisition, exchange, protection, distribution and utilization of knowledge, intellectual capital and intangible assets.

KM has already demonstrated a umber of benefits and offered justification for the further implementation in organizations. According to a number of published studies, KM has a positive impact on several business processes. If a software organization succeeds in capturing and dispersing knowledge, the benefits would be endless. The company not only can leverage and fully utilize its intellectual assets but also gain competitive advantage by responding quickly to the requires of clients, creating new markets, reducing its project cycle time, and improving productivity and improving quality.

Knowledge Management in Software Organizations

Managing knowledge in IT industry is an important activity because it involves many people working in different activities and phases (e.,g, software development, system support and system administration) (Johnny and Bolloju, 2005). Moreover, software engineering is a highly knowledge intensive activity and software organization constantly need to adopt new technologies and improve their practices.

KM has, therefore, been used to improve practices within software organizations, in general, and Software Process Improvement (SPI) initiatives, in particular (Mathiassen and Pourkomeylian, 2003). Many research studies have been conducted for demonstrate the relevance and usefulness of applying knowledge management to software organizations.

Arent et.al (2001) studied organizational learning process within software organizations. They proposed two main strategies for learning first, the exploration strategy focusing on knowledge sharing and learning by doing, and second, the exploitation strategy aiming to create explicit knowledge in the form of standard processes and guidelines. A study by Kautz and Thaysen (2001) dwelled upon how knowledge, learning and IT support occur in small software organizations. Some of the studies have been done in the context of SPI initiatives in software organizations. SPI is a structured approach to improve a software organization's capability to deliver qualify services in a competitive way (Mathiassen and Pourkomeylian, 2003), SPI initiatives are evolutionary and inspired from quality management theory and practice. The most popular model among the SPI initiatives is the Capability Maturity Model (CMM). Arent and Norbjerg (2000) studied how Pries Heje (1999) analyzed the role of KM as a source for development supplementary key process areas to the CMM in small and medium, sized companies.

Rus and Lindvall (2002) pointed out five critical knowledge needs for achieving business goals in IT industry.

- Acquiring knowledge about new technology.
- Accessing domain knowledge from which software is developed.
- Sharing knowledge about local policies and practices.
- Capturing knowledge and knowing who knows what; and
- Collaborating and sharing knowledge.

At Satyam Computer Services Ltd, the company has identified four major challenges in KM implementation – developing a sharing culture, building and sustaining the system, deploying the infrastructure, and ensuring content of quality. With the judicious use of KM, the company aims at empowering every employee with the knowledge of every other employee in the organization and transform the corporate knowledge into corporate asset.

Alavi and Liedner (2001) developed a framework of organizational knowledge management processes, which classified which classified knowledge management system consists of four knowledge transferring or sharing is considered to be the most essential process of KM (Bock and Kim 2002)

II. ROLE OF KNOWLEDGE SHARING IN SOFTWARE INDUSTRIES

Knowledge Sharing is a key component of an organization's Knowledge Management strategy (Alavi and Liedner, 2001). Knowledge sharing is a set of behavior that involves the exchange of information or assistance to others. It is separate, which typically involves management making information about the organization (e.g, financial statements) available to employees at every level

(Connelley and Kelloway, 2003), Knowledge sharing is defined as the process where individuals mutually exchange their knowledge and jointly create new knowledge (Hoof and Ridder, 2004), Bartol and Srivastava (2002) defined knowledge sharing as individuals sharing organizationally relevant information, ideas, suggestions, and expertise with one another. Connelly and Kelloway (2003) further indicated their knowledge sharing is a set of behaviors that involve the exchange of information or assistance to others.

A plethora of studies has demonstrated the benefits of knowledge sharing in organizations. Similarly, some studies have also pointed out the problems that organizations have to endure because of lack of knowledge sharing in the organizations. Too often, employee in one part of a business start from scratch on a project because of lack of a knowledge sharing culture. For example, a department AT &T spent close to $80, 000 for information that was available technical information document from its associate company, Bell Research Corporation, for a mere $13 (skyrme, 1999)

With the information technology environment and information systems applications growing examples, there is an increasing need for knowledge sharing in software organizations. Computers conferencing has special significance today in the IT industry. As a team uses computer conferencing to collaborate a permanent and sharable record of what they share with one another is recorded, and serves as a record of the knowledge sharing that took place.

Need for knowledge Sharing in Software Organizations

III. MARKET DYNAMICS

The cycle time for software development projects have been constantly shrinking as a result of rapid technological progress and competitive pressure from the market. As a result, software development teams invariably have to work under right schedules. Knowledge sharing initiative would help to improve work processes. Woitsch and Karagiannis (2002) have pointed out that the overall goal within Km is to support the daily work of employees. In the IT industry, they day-to-day operational activities involved extensive knowledge, which needs to be shared and reused among employees. It is implied here that there is need for elimination of duplicate mistake by learning from the past and also transferring the best experiential knowledge from one location or project in the firm to another. Starting each project from scratch would have a negative impact on the efficiency and productivity of the company. Knowledge sharing can be a means of making available the necessary knowledge at the right time to the right person, at the right place, and thus, helping the company to be more responsive to market changes. Barney (1999) noted that it an organization could utilize the collective employee and skills, it would create intangible assets, which are

unique, and not easily replicated by competitors. Song (2001) indicated that through effective knowledge sharing, organization can improve efficiency, reduce training costs, and reduce risks due to uncertainty.

IV.   TEAM-BASED WORK

Software development activity almost invariable exceeds the capacity of an individual, requiring collaborative problem solving, and is hence carried out in project teams. Team is a group of two or more people who are distinct managerial and social unit embedded in a large organizational structure, engaged toward achieving as common objective (Goodman et.al, 1986). A team thus is a group that is very well-knit because it shares common vision, responsibilities and achieves a high degree of synergy between the mutually interdependent efforts of its members (Carmel, 1999)

It has been found that within a software development team, the productivity difference between exceptional performers and average performers is wider than any other engineering discipline (Brooks, 1987). These characteristics compound the need for knowledge sharing among team members of a software development team. Team members with diverse skills, experience and technical expertise should be able to exchange and share knowledge among them to achieve their collective goal. It is not unusual phenomenon in software organizations to have team member to join a project at various stages. There is a need for knowledge sharing to mark project more effective by enabling integration of knowledge across individuals as well as organizational boundaries.

Obsolescence of technical skills in software industry is a serious issue. If a software development professionals feels that he/she is at the end of the road and cannot tackle the growing challenges in technology, negative attitude towards the job creeps in, and as a result, the person can become isolated in the profession and can stop communicating (Sheparo, 1985), Knowledge sharing can play a critical role in providing access to new or emerging technical know-how. Teams with access to valuable knowledge can use is effectively by timely integration of the knowledge for completion of the project. Knowledge sharing can possibly be used as a key to sustain competence among software professionals and perhaps their competitiveness too.

V.   TACIT KNOWLEDGE DRAIN

Tacit knowledge is personal; it is embedded in individual experience, and is involves intangible factors such as personal beliefs, perspectives and underlying values (Nonaka andTakeuchi, 1995). When a software professionals leaves an organization, in addition to the loss of team cohesion, the organization often loses the intangible undocumented knowledge that they posses about the product, the domain and the desire that are essential to the project's completion. The exit of an IT professional who knows a project

inside and out can delay or even present the implement or development of a new system or project (Moore and Burke, 2002)

Highly marketable employees with certain unique knowledge and skill set can spell disaster for the company when they decide to leave the company. Competence drain that goes to the competition is probably the worst that can happen to a company struggling through the new knowledge economy. To ensure business success, an organization may choose the pursue an HRM strategy designed to retain and develop high quality employees (Huselid, 1999). People could provide a core competence, which will then translate into valuable intellectual capital for the organization (Nonaka and Takeuchi, 1995). The capability of individuals to learn collectively could provide a source of competitive advantage for the organization (Mac Neil 2004) Tacit knowledge cannot be easily communicated to another person, whereas explicit knowledge can be articulated and copied through continuous contract within teams, and communicated during this 'apprenticeship-like relationship' then tacit skills could be practiced by the individual employee using the team as a forum for the creation and sharing of that tacit knowledge (Mac Neil, 2004). If knowledge is individualized, fragmented and not shared, then individuals will learn separately without the inclination to share their knowledge (Mac, Neil, 2001)

VI. FINANCIAL GAIN

It can be observed that as an asser, knowledge defies economic theory, where assets are subject to diminishing returns in the long run. Contrarily knowledge assts increase in value as more and more people use them over a period of time. Knowledge sharing provides opportunity to integrate knowledge in a way that enriches the quality of decision, making throughout the organization. KPMG's (2003) study reported that companies estimate 6% of annual turnover or budge is being missed from failing to exploit available knowledge. In addition, about 78% companies who participated in the study believe that they are currently missing out an business opportunities by failing to successfully exploiting available knowledge. Effective knowledge sharing can bring about measurable returns by improving the quality of decision making reducing the project cycle time, improving morale, increasing productivity and also aiding innovations.

VII. PROMOTING KNOWLEDGE NETWORK

Organizational researchers and practicing managers acknowledge the importance of social networks to organizational effectiveness and efficiency (Hoegl et. Al, 2003). Human networks are one of the key vehicles for sharing knowledge (McDermott and O'Dell 2001) Networks allow knowledge transfer among teams, providing opportunities for learning and cooperative, while at the same time, enabling the creation of new knowledge and enhancing the organization's ability to innovate (Tsai and Goshal, 1998). Hoegl et. Al (2003) further added that given the critical importance of networks and knowledge sharing, it is important for the organization to stress the importance of building networks and supporting a networking

friendly environment, where the members of the organization are willing to informally assist other members in accomplishing their tasks.

The following recommendations have been made to managers to encourage network building (Hoesgl et. Al 2003)

(a) Stress the short-term and long-term importance to the organization of individual's network buildings:
- Provide training/awareness of the designers of "groupthink";
- Provide examples of successful "out-to-the box" thinking;
- Encourage project teams to critically examine their knowledge, skills and resources with regard to their project task; and
- Encourage project teams to the make every effort to be connected with the rest of the organization (and beyond necessary). S

(b) Create a strong organizational knowledge sharing climate;
- Make project relevant information easily successible;
    - Establish and maintain relevant online directories and databases in the company intraner; and
    - Digitize printed information so that it can be accessed through a company intraner.
- Encourage individuals to build networks within the organization;
    - Create cross-functional teams;
    - Provide organization wide information sessions emphasizing goals, needs, and resources of various department;
    - Organize social gatherings with different related organizational units;
    - Hire individuals with established networks or a perceived potential of building team; and
    - Measure network development/activity as part of the individual's goal-setting/annual review process.
- Encourage individuals to provide assistance to others within the organization:
    - Measure assistance to others as part of the individual's goal-setting/annual review process and
    - Provide rewards (bonuses, recognition, extra vacation days, company logo merchandise, etc) for demonstrated assistance to other.

VIII. CONCLUSION

The potential benefits of knowledge sharing have perhaps forced software companies to address the issues of how best to create and develop a knowledge sharing culture that integrates and supports its people, systems

and technology. Knowledge management and sharing is about survival in a new business world- of competition that increases in complexity and uncertainty each day. For a software company, effective knowledge sharing can ensure better quality, better productivity, reduction of cycle time, reduced business risks, and eventually, bringing higher revenue growth as well as increased customer satisfaction. IT companies should align their human resource strategies, practices and processes in such a way that knowledge sharing becomes a part of the organizational culture. Efforts should be made to overcome the potential barriers to knowledge sharing in the IT companies. There is need to develop systems that can recognize and reward the efforts of employees who share their knowledge. This can act as a positive reinforcement for knowledge sharing in the software industry.

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