Implementing an Effective Knowledge Management Program:
A Best Practice Case Study

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ABSTRACT

This paper is a discussion of the evolution and development of a Knowledge Management (KM) system at a major innovation and project-based software organization that delivers custom IT enabled business solutions to customers across the globe, that we will refer to as ABC, Inc. This study looks at the lessons learned in the process from the point of view of the author, who served as a consultant and a member of the KM team for a time. Some of the lessons may serve as best practices, especially for project based organizations who are embarking on an integrated approach to the leveraging and management of organizational knowledge.

Keywords

Knowledge Management, Case Study, Best Practices

1.0 INTRODUCTION

1.1 Relevance of Knowledge Management

Knowledge Management (KM) is very relevant to any <u>learning</u> organization, and learning is the basic premise of continuous process improvement. KM is an essential part of the making of a learning organization. According to (Nonaka, 1994) "knowledge creation should be at the epicenter of a company's corporate strategy." The role of information and communication technologies is to support the KM effort in its various activities and to suggest new efforts made possible by the existence of or cost-effectiveness of enabling technologies. For project-based organizations, there is a dire need to capture the learning from individual projects and individual groups and make it available throughout the organization. The challenge is to gather, codify, communicate, and eventually reuse such knowledge.

1.2 What is KM?

Knowledge Management consists of the following steps or stages (Rajamani, 2000):

1) Develop knowledge
   Acquiring, capturing, creating, discovering, adapting, etc.
2) Preserve knowledge
   Storing, securing, categorizing, indexing, linking, etc.
3) Update knowledge
   Evolving, improving, maintaining, refreshing, etc.
4) Transfer knowledge
   Communicating, deploying, disseminating, presenting, sharing, searching for relevant content ("pulling"), subscribing to relevant content ("pushing"), training, mentoring, briefing, publishing, etc.
5) Transform knowledge
   Compiling, formalizing, standardizing, summarizing, classifying, generalizing, contextualizing, adapting, etc.
6) Assess knowledge
   Appraising, evaluating, validating, verifying, etc.
7) Apply knowledge
   Using, enacting, executing, exploiting, integrating, etc.

Knowledge Management works with "knowledge assets". Knowledge assets are knowledge regarding products, markets, the organization, technologies, and processes, which enable business processes to add value, generate profit, increase total quality, increase customer satisfaction, etc. These may be tacit (i.e., highly subjective insights, hunches, etc.) or explicit (Nonaka, 1994), (Polyani, 1995), (Romer, 1995). Moreover, they are context dependent. One of the most significant differentiating factors between "information" management systems and "knowledge" management systems is the problem of how tacit and contextual knowledge is incorporated. It is an area, however, that most of the existing software technologies and KM methodologies fail to address. Most knowledge is stored in the heads of individuals and within business processes, and will never be translated into useful electronic forms.

2.0 KNOWLEDGE MANAGEMENT: THE ABC, INC. PERSPECTIVE.

As an innovation and project-based software organization located in India, ABC, Inc. (not its real name) recognized early on the need to capture the learning from individual projects and make it available throughout the organization. This is a major concern in many organizations worldwide. Knowledge is viewed in progressive companies like ABC, Inc. as 'intellectual capital', and there has been a focus on recognizing the value of the organization's knowledge base. In ABC, Inc., Knowledge Management reflected company's desire to increase the productivity of its knowledge workers, breaking down some of the barriers to knowledge sharing which are associated with 'professionalism' or 'departmental ownership'.

ABC, Inc. operates in the fast-paced, dynamic software industry. With employees in several sites around the world and a workforce that has expanded from a couple of thousand ten years ago to tens of thousands, the company found it increasingly difficult to keep its staff current and informed of the best practices and reusable items produced by their peers and potentially usable by others in the company. ABC, Inc. wanted to give its varied and disparate workforce access to both the structured information and knowledge captured in databases and transactional systems, and the unstructured information knowledge residing in processes, documents, e-mail messages, chat sessions archives, problem resolution reports, "backs of envelopes," and even people's heads. The company had to find a novel scheme of getting timely, relevant information to each of its employees and to share learning among employees. The solution was to organize a central KM Group (consisting of six to eight members) and to embark on a major KM project. The KM group's task was to develop and maintain the infrastructure for knowledge sharing, facilitate the content development, and develop methods that would make knowledge reuse possible. In addition, *practice champions*, selected from each project unit or department were to take ownership for content from his/her respective unit, and also play a pivotal role in being the champion for KM in their unit and interfacing with the unit members in all KM related matters (Kochikar, 2000). The organization adopted the slogan "Learn Once, Use Anywhere" and the following as its goals of KM (ABC, Inc., 2000):

- All organizational learning is leveraged in delivering business advantage to the customer
- Every employee must have the full backing of the organization's learning behind him/her

The *KM Vision for ABC, Inc.* was to be an organization:

- Where every action is fully enabled by the power of knowledge;

- Which truly believes in leveraging knowledge for innovation;
- Where every employee is empowered by the knowledge of every other employee;
- Which is a globally respected knowledge leader.

The following were recognized as the main outcomes or benefits of this endeavor:

- The knowledge-management system can foster a new sense of cooperation at ABC, Inc..
- With it, access to information is easier, and sharing knowledge is encouraged.
- The walls will come down between organizational entities, with less concern for who owns the information and more regard to collectively sharing knowledge.

The KM Group at ABC, Inc. then developed an enterprise-wide set method for organizing the company's knowledge, organizing these around topics, issues, and the information that people need to do their jobs. This was a very smart idea indeed. Organizing knowledge this way cuts across departmental boundaries and results in logical groupings of information that are independent of department origin. For the use interface, a KM portal was chosen, that would display a customized representation of relevant stored knowledge assets. The portal provided the vehicle for integrating the collection and the organization of knowledge. The idea became one of connecting all those with common concerns by giving them the tools and the information needed to work together electronically. A portal desk-top where knowledge workers can perform day to day work, share content, have real time "on-the-fly" linkage to related content and, more importantly, the content providers and the knowledge experts within the organization, became the key to creating an effective KM program. It may even be said that corporations will get more value from connecting people than collecting and even sharing content. This would then result in the argument that technologies that connect knowledge workers to other knowledge workers should be employed whenever possible.

The components of KM at ABC, Inc. included the following KM (ABC, Inc., 2000):

- BOK (Body of Knowledge)
- Process Assets
- Quality System Documentation
- Discussion Forum
- The People Knowledge Map (Yellow Pages)
- Best Practices Seminars
- Departmental Knowledge Portals
- Online Learning Material
- Online documentation

It must be said that some of the information in the above discussion about the KM-related activities, strategies, and decisions at ABC, Inc. have evolved over time, and some have metamorphosed into more mature processes by now.

3.0 THE INFORMATION AND COMMUNICATION TECHNOLOGY BUILDING BLOCKS OF THE KNOWLEDGE MANAGEMENT SYSTEM AT ABC, INC.

The information and communication technology building blocks of the Knowledge Management system at ABC, Inc., during the time frame of this KM case study, consisted of an SQL Server for its back-end databases; a version of Microsoft Windows for the server operating system; versions of Microsoft Exchange Server® for messaging and collaboration; versions of Microsoft Site Server® for search, personalization, and publishing; and Microsoft Visual Studio®. On the desktop, employees used different versions of Windows operating system; Microsoft Internet Explorer; versions of Microsoft Office; and the Microsoft Outlook® messaging and collaboration client as information desktop access tools. The key advantage of Microsoft was found to be its link with its familiar Office suite and the seamless integration of other Microsoft products like BackOffice®. The main benefit of Microsoft products was recognized as the common interface and integration of the different tools it provides.

4.0 KM: ABC, Inc. Challenges

The following were recognized by the leadership within ABC, Inc's KM Group as the major challenges faced by the company in developing a successful KM program, as described in company reports and as gleamed from conversations with the KM Group members:

- *Promote a sharing culture*. One of the most important and difficult problems facing KM in all organizations. At local levels, people often have good insights about various problems and situations, but when you look at the question of sharing from their motivational standpoint, a typical employee is essentially trying to figure out how to keep out of trouble or how to get up the next step of the career ladder. But they are the ones who have to be involved in this sharing mode of thinking. A fundamental shift in organizational structure or design may be required.
  - Evangelize the movement
  - Build trust
  - Promote group interest over self-interest
  - Reduce the "What good is this for me/my project/my department anyway?" thinking

- Make contributions & reuse happen
- *Tacit knowledge transfer - how to do it*
- *Intelligent analysis of information.* This is a fast growing software area, and strives to make vast amounts of knowledge items tangible, accessible, and useful. Some of the technologies that are applied in this area are expert systems, OLAP (On-Line Application Processing,) neural networks, and intelligent filters (for external news.
- *Build and sustain momentum*
- *Inadequate information and communication technology tools*
- *Ensure quality and currency of content*
- *Measure the benefits of KM*

Other specific challenges included:

- *Granularity/type of knowledge items*, e.g., full-text or summarized or sign posts or yellow pages
- *Source credibility/authenticity*
- *Avoid information overload/clutter*
- *Need to respect data/information protection* because of various reasons such as client preferences
- *Uncover the knowledge hidden in "legacy data"* by use of data mining techniques
- *Evolution form search engines to "Knowledge navigators,"* by using the latest developments in Artificial Intelligence
- *Knowledge representation & search tools* that give user only "useful" knowledge for the user's needs, Artificial Intelligence based
- *Degree of goal orientation* - e.g., there was a great deal of debate between the Wincite way versus the grapeVINE way. Wincite is a goal-oriented integrated KM product that organizes and distributes information related to a specific problem, whereas grapevine, a competing product, stores information on a variety of topics and distributes it to people based on their individual profiles.

5.0 THE "STATE" OF KM AT ABC, INC. – A.K.A. KM MATURITY LEVEL

In KPMG Consulting's Knowledge Management Research Report (KPMG, 2000) is reported the results of a survey conducted among chief executives, finance directors, marketing directors and those with specific responsibility for KM at 423 organizations with turnover exceeding $347 million a year. The KM Group at ABC, Inc. used the questions from this survey, administered it to a small group in the company, namely the KM group members, and compared the results with KPMG's survey results. The survey had a number of KM-related activities that respondents were asked to evaluate with respect to their organization's KM implementation, organized

into four areas. The results indicate where an organization is in its knowledge journey.

Stage 1 – Knowledge Chaotic: 3 or fewer of the items
Stage 2 – Knowledge Aware: 4 or more, drawn from at least 2 sections
Stage 3 – Knowledge Focused: 6 or more, drawn from at least 3 sections
Stage 4 – Knowledge Managed: More than 2 from each section
Stage 5 – Knowledge Centric: All

Their findings indicate that 43% of the companies surveyed were at Stage 1 – Knowledge Chaotic. Only a third (32%) could be said to be at Stages 2 or 3 – Knowledge Aware and Knowledge Focused. Only 10% were at Stages 4 or 5 (only 1% were at the latter stage).

The following were the findings as far as ABC, Inc. was concerned (ABC, Inc., 2000):

- ABC, Inc. is at Level 4 in KPMG Knowledge Journey
- Recall: only 10% of the surveyed firms are at Levels 4 or 5; 1% at Level 5.
- Like most, ABC, Inc. has ways to go in all 4 areas, especially in process and technology areas
- A limitation of ABC, Inc. survey and the resulting conclusions is the small size of the sample.

6.0 LESSONS LEARNED FROM THE ABC, INC. CASE

The highly successful effort undertaken at ABC, Inc. to establish a KM portal and an effective company-wide KM system using the available information and communication technologies provided some very valuable lessons, which we summarize in this section.

6.1 Collection and organization of knowledge items

KM becomes effective when knowledge can be turned into timely aid for action. The collection of sharable content, if not properly managed, can increase cost and can make later reuse difficult or impossible. After all, just having sharable content, a knowledge repository, does not translate into knowledge. If that were the case, we all could buy books and skip the cost of college. It is clear that to have an effective KM program the collection as well as reuse of sharable content must be *integrated into and become normal by-products of our work processes*. Collection of sharable content as an after-the-fact activity in a separate KM system that is not a part of the day-to-day work processes will not be successful.

There needs to be a well-defined and mature process for collecting and organizing the information that is of value. It is more common for companies to store unmanaged information, which may not be usable, on their intranets. The browser then becomes a well-integrated information portal to browsing the many repositories of information—databases, e-mail, discussion groups, computer-based training, collaborative tools, file servers, Web servers, applications etc. The process should include a method of identifying the collective and usable knowledge of the company, delivering just what people need to do their jobs and filtering out the rest, and managing this knowledge so it's always current and focused.

Also, the KM portal should satisfy employees' need for personalized, just-in-time information. Such information may be "pulled" from the Knowledge Center or "pushed" to end users by e-mail or another vehicle, whenever it is needed. Employees ought to be able to personalize the Knowledge Center as their "home page," resulting in the display of information relevant to their work and interests. The Knowledge Center could include, in addition to the KM portal itself, a set of separate applications that employees can launch to do specific tasks: survey employee skills for assembling a project team, schedule consultant time, register for a class as a team, read competitive intelligence, and so forth.

6.2 Personnel Support

A dedicated knowledge-management staff should oversee the selection and presentation of information across the organization. ABC, Inc's idea of having a company-wide KM Champions Group of representatives selected from each project and each department is a good one, because such a group can be of major assistance to the small KM staff. In addition to serving as the champions of KM within their teams, this group of individuals may also perform certain KM-related activities. Should there be dedicated staff to manage the day-to-day KM activities? It turned out that ABC, Inc's Km solution did not have one, instead they relied on voluntary efforts of its already over-worked workforce. "Without a full-time staff to manage [this kind of activity,] we'd have a million documents that help no one," says Alden Globe, a designer of J.D. Edwards' Information Network and a product manager in their Knowledge Information Systems Group. "If people don't have a way to quickly find just what they need and no more, when they need it, information isn't actionable and can't do anyone any good."

6.3 Minimize knowledge sharing overhead

Quality processes should be minimally changed to ensure contribution to knowledge sharing as a natural by-product of project execution. This may be done in

part by "automating" the capture of knowledge. Such a knowledge capture scenario may consist of the following sequence of steps:

1. Document the *thought processes*, however brief, that went into the activity, real time, using mandatory fields in web forms used for tracking
2. Team leaders review, add short comment, and post it
3. Other reviews, feed backs etc. should follow.

With rewarding, encouraging, highlighting, and in time mandating this activity, documenting thought processes can become as routine as code documentation.

6.4 Reward scheme for participating in knowledge contribution and knowledge reuse.

Knowledge contribution and knowledge reuse activities would not just happen, but may have to be tied to incentives in order to be popular and widespread. ABC, Inc. did implement a reward scheme when this study was made, which in time became a big success for the company and for its KM effort.

6.5 Annual "conferences"

An annual conference may be conducted for sharing of new knowledge arising from the 'research' of individual employees. Presentations may be for employees by employees and invited guests; this may perhaps include some training on KM. This is similar to Motorola University's well-known annual conferences held worldwide. Such forums provide "a means to distill the knowledge created on the fringe of employees' activities and make it a part of the core knowledge, in a constantly churning process of organizational transformation that essentially turns the organization inside out" (Baldwin and Danielson, 1997).

6.6 Middle management support

Apart from the obvious need for upper management support, middle management must be sold on KM, because support and acceptance at that level is crucial to success and widespread acceptance of the concept. Middle management can help evangelize and effectively convert the work force under their charge. Yet, many in middle management positions are not quite sold on quality, let alone KM; these are perceived as not contributing to the bottom line. Middle management must be kept posted of the KM initiatives being planned and developed, through periodic meetings and other methods of communication.

6.7 KM Support Group

The Practice Champions (PC), though good, may not work if it consists of one part time person per project or department. This individual's work will tend to be "mocked" by the majority of a KM-unfriendly project team as "not contributing to the bottom line." This was found to be happening in connection with the Quality Champions in some projects. It is important to get the confidence of everyone, especially the Project Leader and the Team Leader. PL's and TL's may be made a part of a wider KM Support Group.

6.8 Information and Communication Technologies (ICT)

The use of the latest, most up-to-date and the best ICT tools cannot be overemphasized in the design and in maintaining the most effective KM system possible. Even though most of the emphasis in KM research is on what a colleague calls the "soft skills, " it is still the power of the technology that mostly dictates what can or cannot be done. The plethora of software tools that are available to support the main stream and the supporting KM activities are constantly getting better, with newer technologies such intelligent agents, semantics web, service-oriented computing, web services in general, agile computing, ubiquitous and pervasive computing, mobile technologies, advances in data mining and machine learning, advances in information security, just to name a few, all have a place in the future end-to-end workforce collaboration and knowledge management system of any company, as is being shown by successful efforts in organizations such as ABC, Inc.

6.9 Continuous Improvement in the KM Process

Last, but not least, there is no substitute for the establishment of a continuously improving and mature process. KM frameworks, KM services and KM technologies will constantly surface and make their waves. As the successful experiments of companies such as ABC, Inc. show, a systematic and grass-roots effort in developing a sound and mature process with the clear aim of developing a scalable and evolving enterprise-wide system that harnesses the sharable intellectual capital of the knowledge-work force is what would ultimately pay dividends.

7.0 SUMMARY

The study of the development of KM at ABC, Inc. showed several noteworthy "best practices" as well as lessons learned. As one of the more progressive and "KM-mature" software organizations spread across geographical regions and expanding rapidly in its workforce, the company was in a sense forced to invest in examining and then developing a first-class KM

system that would later become a model for other similar project-based organizations and others. In this case study I have tried to capture some of the issues that the KM Group had to deal with during the development of the KM system and the main lessons learned.

8.0 ACKNOWLEDGMENT

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