Requirement for knowledge management: business driving information technology

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Abstract

Purpose – The paper aims to provide a roadmap for organizations to implement a knowledge management system that reduces loss of critical information and improves data retrieval.

Design/methodology/approach – The focus is on how to devise and implement a knowledge management system where information is sorted by definition, business requirements, and implementation.

Findings – The paper provides information for defining information sources and simplifying data retrieval. It recognizes the need to collect and retain corporate information through cooperation of knowledge workers. Centralized storage and retrieval of information is critical to knowledge management.

Originality/value – This paper provides insight and help in eliminating loss of corporate knowledge when skilled workers leave or retire.

Keywords Knowledge management, Knowledge transfer

Paper type General review

Introduction

Baby boomers are retiring, companies experience increase competition, and business knowledge is difficult to find. Employees need to be able to access important information to have an edge over the competition. Therefore, businesses need to prevent this loss of corporate advantage in the marketplace. To do this requires finding a way to quickly capture, store, and utilize critical processes and best business practices to maintain a competitive advantage. Businesses need to develop requirements and drive a complete solution. Thus, an operative paradigm of business requirements drives Information Technology (IT) illustrates how to solve this problem. This paper will look at the steps business needs to follow to develop a knowledge management methodology and guiding principles for its implementation.

According to Jamrog (2004, p. 27), by 2008, ''the leading edge of 76 million baby boomers (people born between 1946 and 1964) will turn 62 and in the next decade 43 percent of the civilian workforce will be eligible to retire.'' Jamrog (2004) also points out that these baby boomers will not retire but leave their current employer. They hold key positions in companies and have critical business knowledge. Their knowledge and use of best business practices are paramount to a company keeping its place in the market place.

Today organizations need to keep up with competitors and use knowledge to beat them. This requires organizations to develop a culture of gathering and sharing knowledge across the company. Company managers have been using their employees' knowledge and experiences on an ad-hoc base (Gupta et al., 2000). Companies also have a ''vast reservoir of knowledge in a wide variety of organizational processes, best-practices,

know-how, culture, and norms'' (Gupta *et al.*, 2000). Unfortunately, this knowledge is scattered across the organization and unrecognized by others. Employees need to be able to quickly access this information and use it to outsmart the competition. However, companies are not keeping up with this trend. This requires senior management to make this a top priority and devote resources to define the scope of the problem, develop specific business requirements, and collaborate with Information technology (IT) staff to implement a solution. This calls for using the best business practice of using knowledge management systems.

Definition

Robbins (2003, p. 575) defines knowledge management (KM) as a ''process of organizing and distributing an organization's collective wisdom so the right information gets to the right people at the right time.'' Van Beveren (2002, p. 19) further defines knowledge management as ''a practice that finds valuable information and transforms it into necessary knowledge critical to decision making and action.'' Laudon and Laudon (2003, p. 87) goes a step further by introducing ''knowledge-level decision making based on the evaluation of new ideas for products, services, ways to communicate new knowledge, and ways to distribute information throughout the organization.'' This suggests that firms can only sustain a competitive advantage when valuing its customers input and employee interaction. This interaction sometimes requires an employee to use innovation in order to ''devise problems, define them, and develop new knowledge from them'' (Van Beveren, 2002, p. 19). The continuous process of using innovation will help a company maintain its position in the marketplace. KM also involves the resources of knowledge, which are people and information. People are creators of knowledge and information as the processes related to knowledge creation and production. Therefore, we will address KM as being concerned with the identification, acquisition, creation, storage, distribution, and use of both information and knowledge.

There are at least three reasons for using knowledge management methodology. First, company knowledge assets are important as their physical or financial assets. Laudon and Laudon (2003, p. 315) define knowledge assets as ''organizational knowledge regarding how to efficiently and effectively perform business processes and create new products and services that enables the business to create value.'' Being able to tap into the collective experience of employees will help firms improve their competition advantage. Second, companies are just becoming aware of the possible loss of valuable knowledge when baby boomers start leaving the workforce. Lastly, KM systems have proven themselves to reduce redundancy and improve efficiency in organizations. The German telecommunications company, Siemens, provides a good success story of what knowledge management can do. They recently won a contract to build a telecommunications network in Swiss hospitals despite being 30 percent over the lowest bidder. Their secret was a knowledge management system that allowed their sales representatives to illustrate that the Siemens system was more reliable than their competitors were (Robbins, 2003).

Knowledge management is composed of various processes to include: ''generating new knowledge; accessing knowledge from external sources; representing knowledge in documents and databases; embedding knowledge in processes, products, or services; transferring existing knowledge around an organization; using accessible knowledge in decision making; facilitating knowledge growth through culture and incentives; and

measuring the value of knowledge assets and the impact of knowledge management''
(Rowley, 1999, p. 417). These processes will help in defining the business requirements for a
KM system.

Business requirements

Objectives

Before a business can pursue KM, it must first define the project objectives. Rowley (1999,
p. 416) defined these as to ''create knowledge repositories to store knowledge and
information'', ''improve knowledge access'' through connectivity, ''enhance the KM
environment'' in order to allow its effective creation, transfer and use, ''manage
knowledge as an asset'' and value to the firm. A firm must categorize and prune both
knowledge and information before placing it in a repository. The repository will be composed
of external, internal, and informal knowledge. External knowledge composes knowledge on
the ''competitive intelligence'' while internal relates to research and product documentation
(Rowley, 1999, 417). Informal relates to individuals knowledge of how to do certain things.
Access to this knowledge emphasizes connectivity using the latest technology and the
cooperation of the employees themselves. New automated tools such as document
collaboration and data warehouse databases help provide access. For others to gain
knowledge, the experts holding the knowledge need to give it up. This is why the
environment is important and the researcher must beware of cultural norms and values when
gathering information for a KM system. Lastly, companies must manage knowledge assets.
This includes buying and selling information for profit from customer listings.

Design goals

With every successful KM design there are goals to focus on which are ''filtering, integration,
sharing, and offline access'' (Honeycutt, 2000, p. 5). An effective KM system only uses
critical information. There are vast sources of information that cause employees to spend
hours searching for only key data to help them. The KM helps reduce this burden by
''delivering focused, vital business messages through the use of filters, user-specified
categories, and summaries'' (Honeycutt, 2000, p. 4). Another goal involves integrating
information from various sources inside and outside a company. KM systems provide a
means to organize and effectively display important corporate information from files, folders,
e-mails, intranet, and applications. Companies entering the global market place, find it
difficult to leverage knowledge of its employees. Trying to collaborate over vast distances
has become easier using KM systems to locate and acquire ''experts collaborate on
projects, or research corporate presentations and documents'' (Honeycutt, 2000, p. 4).
Lastly, KM gives firms the agility for making effective decisions anywhere and anytime.

Defining business information

After establishing objectives and design goals, its time to begin the process of defining
particular business information. The first step involves identifying what information matters
most and carries the most weight. This includes managers reviewing all their processes and
procedures. Guiding this process is a knowledge analyst (KA) whose job is to ''gather and
model the knowledge requirements'' (Trepper, 2000, p. 163). This requires that the KA work
with employees, customers, and stakeholders to identify the sources of information. These
sources could be personal, team, corporate or even external to the firm. Company

> **" Firms can only sustain a competitive advantage when valuing
> customers' input and employee interaction. "**

employees are a walking book and a wealth of knowledge. Their years of service have developed in an invaluable collection of tips and tricks for problem solving. An effective KA will be able to find cross-functional knowledge in various departments and business units across the enterprise. Their efforts may ''produce political struggles within the organization'' but this is why KM was established (Trepper, 2000, p. 164). The KA then acts as negotiator between different groups and handle delicate issues and turf battles between business units. This will help them complete the information gathering process. Their primary task involves surveying what will it take to build a ''successful information network that achieves an optimized process for solving problems, driving decisions, and getting a competitive advantage'' (Honeycutt, 2000, p. 175).

This information leads to several assumptions. First, the information is critical to the operation of the business. Any lose or damage will prove fatal to the business continuity. For example, lost of sales information can cause the loss of customers and revenue. Another assumption involves the companies desire to keep only important information. Retaining obsolete or miscellaneous information will reduce efficiency and effectiveness of the KM. Lastly, there must be senior management commitment to the implementations and use of KM. Without this support, any KM project is doomed from the start. Employees need to see that the company and senior management see this as a major project and needed. A way of accomplishing this is by including knowledge management as a company objective or goal. Thus, employees will provide greater support and help make the KM project a big success.

Arbnor and Bjerke (1996) identified that looking at creating knowledge from a collective of business ideas. They assumed that it consists of components that are often mutually dependent on each other. This follows the system approach that the ''whole is more or less than the sum of its parts'' (Arbnor and Bjerke, 1996, p. 65). This leads to the concept that the content of the individual components and their construction provides information. If a researcher utilizes the systems approach to determining these needs, they will seek a ''producer-product'' relationship (Arbnor and Bjerke, 1996, p. 70). This relationship looks at the information and its results.

Needs assessment. KM strategy implementation occurs after managers have identified their business requirements. However, managers needs and requirements can change in a short period and could delay the project. This requires the KA to perform a needs assessment. A needs assessment involves comparing and weighing an end-user needs and maintaining the overall business strategy of the project. This requires completing the needs assessment and researching for information together. This keeps the process of developing the KM system moving forward. Needs assessment aims to clarify which information resources will yield the greatest impact as a part of the system. The needs assessment involves looking at business goals, business processes, usage characteristics, and user needs.

Decision making. While defining business requirements, one must not forget how KM can improve decision making for employees and managers. Companies have vast amounts of information scattered over various locations. KM centralizes information through simple access methods such as a web browser that helps employees make decisions anywhere. Managers need to be able to drill down through data and information to gain knowledge for making effective and efficient decisions. A KM system provides a means for analyzing information down to the lowest degree quickly and easily. In addition, these services are available to any employee whenever they need it. Businesses also demand that information be timely and accurate to enable managers to make the right decisions. Otherwise, companies can lose business and profits. Thus, another requirement would be that KM systems provide quick and accurate information. Lastly, employees are not all technical and need any system to be easy to use. This requires automated tools that are user friendly and provide information to anyone using it. Otherwise, employees may not use it.

Employee management. Another requirement for KM involves providing responsive employee management. Employee training, skills, and benefits need monitoring as part of a firms caring and nurturing its own. Honeycutt (2000) identified that an effective KM system can better motivate, reward, and align employees in the organization. Employees are companies internal customers and require attention just as much as a companies business customers. A KM system can help improve employee job satisfaction through sharpening their skills and job opportunities. KM systems can help when the marketplace changes and new skills needed. KM systems can identify skill gaps and provide recommendations to solve the problem. Managers can use KM systems to identify high performers and reward them.

Business characteristics and behavior

While collecting information on what business needs, one needs to keep in mind what the KM system will do for them. Arbnor and Bjerke (1996) identified that business researchers should look at such things as variety, depiction, adaptability, systems objectives, management system, fit, reactions to and in the environment, and recipe. These factors will help drive the particular requirements to keep or discard information from including it in the KM system.

Role of information technology

A business needs to develop its own requirements for KM before engaging IT for assistance. Another aspect of gathering business needs is developing a partnership with the IT organization. To accomplish this involves defining the role of IT in developing a KM system. Duffy (2000) sees IT as managing the storage and access of documents. IT usually maintains the databases, hardware and software access points, survivability of information. However, any KM project can fail when IT techies see only the technical side. They must be aware and educated in knowledge management processes to gain a better appreciation. Once this is accomplished, IT will be a major player in the companies' ongoing KM efforts.

Implementation

The implementation of any enterprise-wide KM system should include six elements. First, establish a chief knowledge officer with responsibility for the political, strategic, and technical implementation of KM. This role can be done by someone already in the organization such as the Chief Information Officer, Chief Technology Officer, Director, or manager with small- and medium-sized enterprises. Earl and Scott (1999) claim that these individuals need to take risks and be self-starters. They should understand what knowledge is important to the organization and how to get people to contribute. As entrepreneurs, they need to be able to transform the organization. This involves setting up a culture for using the system that supports knowledge collaborations. Honeycutt (2000) identified that knowledge workers must use KM systems and document their knowledge in order for KM to work. There should be a reward system for those sharing valuable knowledge. Next, all individual pockets of knowledge management residing on intranets and containing organizational solutions should be interconnected through hyperlinks and create a KM infrastructure. This infrastructure must provide easy ways to create, store and retrieve information. Everyone should implement a well-established set of collaborative processes in order to convert knowledge into information for use. These mechanisms will ''allow employees who have developed valuable expertise and insights to share them with others'' (Robbins, 2003, p. 575). Lastly, firmly placed processes keep the enterprise KM information healthy and current (Honeycutt, 2000).

Establish a Chief Knowledge Officer (CKO)

''Implementing a knowledge management solution presents some challenges. First is the complete integration of knowledge. Maximizing the KM system requires an understanding of

how to build, locate, and relate knowledge. This involves recording the expertise embedded within employees. Firms need to make knowledge and services within the enterprise accessible to others throughout the company. Next involves the technical integration, which looks at what are the infrastructures that need to be in the knowledge management system. Lastly, relates to central manageability. This looks at where integration points are to make the system centrally manageable'' (Honeycutt, 2000, p. 198). These are the reasons for establishing a position within a company to handle these challenges.

To complete this task, a CKO would use Demerest's KM development model, which includes four phases: ''knowledge creation, knowledge dissemination, knowledge use, and knowledge embodiment'' (Rowley, 1999, p. 417). With the help of KAs, the CKO will look at ways to better create and distribute knowledge using automated tools and processes. They will develop and maintain detailed processes and procedures for making KM work in the enterprise. They will also monitor the KM system usage to help identify outdated or useless information and tag it for disposal. Lastly, the KM system needs to allow access from different sources on a global scale. These include users with both wired and wireless connectivity.

Information discovery and KM audit. The first step in developing a KM system involves information discovery through completing a KM audit. The CKO and KAs will work with the organization to ''identify all sources of information assets, locate all sources of knowledge (i.e. staff experience, information on the company intranet and e-mail systems), and establish the knowledge foundations of the organization's core competencies'' (Pemberton, 2004, p. 52). These audits use questionnaires, surveys, interviews, and group discussions in order to capture these sources of knowledge and information. The results of audits include ''knowledge maps and intellectual asset locators'' (Pemberton, 2004, p. 53). Knowledge maps capture and disseminate knowledge throughout an organization. These maps help firms ''identify where knowledge resides and which knowledge needs to be shared with whom, how, and why, with built-in rewards for knowledge creators and brokers'' (Gupta *et al.*, 2000, p. 21). These lead to development of knowledge-based strategies and the scope of the project.

Part of this strategy will involve carefully scrutinizing all knowledge and information for its organizational value. This value will be based on the ability of transforming knowledge into information (Van Beveren, 2002). The KA team will work with stakeholders to identify and dispose of content with no critical value to the organization. More valued knowledge will be stored and made available to others through hot lists on KM portals (Honeycutt, 2000). While a researcher investigates and collects information, they find that most turns out to be a collection of rules and procedures.

A key part of the information discovery involves knowledge workers. Laudon and Laudon (2003) defines knowledge workers as someone that designs or creates services within a firm. Laudon and Laudon (2003) identified three key roles that knowledge workers contribute to KM. They are the vessel for keeping up to date knowledge of customers and industry changes. For example, improving a firms' competitive advantage by keeping up with technology changes and how organizations use them. Next, knowledge workers are consultants to staff and managers in helping them cope with these changes and illustrating opportunities for keeping pace with the marketplace. Lastly, knowledge workers are change

" **A firm must categorize and prune both knowledge and information before placing it in a repository.** "

agents that ''evaluate, initiate, and promote change projects'' (Laudon and Laudon, 2003, p. 319).

The variable to this process is how much information needs to be stored. This fact drives the need for IT resources and determines the performance of the KM system. The KA team needs to work with IT staff to determine size and performance characteristics of the KM system. Van Beveren (2002) suggests that IT improvements will provide the necessary tools for implementing knowledge management. The biggest controlling variable in the KM project involves how much money has been budgeted for the project. This involves looking at resource costs, project schedule, volume of requirements, and amount of information to be stored.

Instituting culture change

Organizational culture plays a critical part in the success of any KM system implementation. The culture must foster the sharing, learning and creation of knowledge in order to produce information that can improve business (Gupta *et al.*, 2000). However, Honeycutt (2000) noted that high producing employees benefited most from a KM system compared to people in companies that restricted open flow of ideas and innovation. This may involve breaking down organizational barriers and directly affects the success of any KM deployment.

''A major problem is how to convince, coerce, direct, or otherwise get people within organizations to share their information'' (Gupta *et al.*, 2000, p. 21). This is a major challenge for the CKO in dealing with change management. These changes include getting senior management commitment, knowledge owner's participation, employees to use system, and technology support. Some of these technologies include data warehousing and data mining tools, document collaboration systems, company intranets, electronic mail, desktop video conferencing, chat rooms, and web-based software applications.

Getting senior management commitment to KM is critical to its success. Without this commitment, employees will not see KM as a business necessary and not contribute to it. Gao *et al.* (2002) stated KM systems needed to nurture favorable environments for engaging in knowledge activities. This involves getting companies to promote employee creativity and innovation by leveraging human capital for the sharing of information (Van Beveren, 2002). Managers need to nurture innovation and creativity from employees or experts. To do this requires managers to create an atmosphere of trust, team spirit, and learning climate for improving contributor's productivity. Encouraging employees to share knowledge as equals with other and stakeholders is one way. Efforts to discover, use and share professional intellect are more effective when people are consistently recognized and rewarded for their understanding of the entire knowledge process and for using their creativity and intuition at work.

To encourage this behavior, managers need to implement a fair and equitable reward system (Smith, 2001). This reward system clearly states expectations from each knowledge employee and the benefits of knowledge sharing. Instill a sense of trust and commitment within the system for creditability. Otherwise, the employee may only share a small portion of their knowledge. One-way is to show how knowledge sharing and open communication can improve not only company profits but also get an employee recognized. Using motivators such as bonuses, percentage of company profits, peer recognition, special titles, and challenging assignments can be a positive influence on employees.

Another challenge is getting employees to use the KM system once it is built. A KM system of integrated customer networks and databases allow employees easier access to information they need to do their jobs. However, KM will not function without information sharing and people can be reluctant to share their information. Thus, organizations need a culture that promotes and values open communication. Finally, ''KM must provide the mechanisms and

the motivation for employees to share knowledge that employees find useful on the job and enables them to achieve greater performance'' (Robbins, 2003, p. 575). KM can leverage their professional careers and personal knowledge could be a big boost. Another way is forming community teams that identify, gather, and share new knowledge assets. Giving these individuals complete control and ownership over the knowledge ideas will help foster their productivity. They should have a pleasant and stimulating environment to create, gather, and share information. A thing to remember is that getting more information does not mean you will have more knowledge. Design KM systems to avoid information overload. KM systems need to capture only pertinent information and then organizing it for easy and quick access by anyone having a need.

Only after identifying the knowledge management services needed can technology be considered. This directly supports the operative paradigm business requirements drive IT activities. It also supports the idea that IT is an enabler of knowledge and people provide the content and management. Weight all IT resources against improving specific business processes. Honeycutt (2000, p. 199) identified that a ''summary of the system infrastructure requirements should be measured against the services the knowledge management system required'' to help define the scope of the project. Without this, there could be unnecessary costs and increases in the project schedule. The best way of avoiding this situation is to find out what best works for the company. Some variables to consider include ''functional fit, technical fit, cost, and cultural fit'' (Smith, 2001, p. 318). Functional fit involves seeing how the technology will support the new business function changes. For example, will the technology support finance moving to web-based billing statements. Technical fit relates to how well the new technology will integrate with current systems and data. A good example is deploying a data warehouse database on the current back office environment. Cultural fit is the most important because it affects the flow and openness of knowledge sharing. Lastly, cost will drive the scope and accomplishments of the KM project. The best way of handling this is establishing a return on the investment for all requirements and proposed technology. This will ensure projects come within scope, schedule, and budget.

Van Beveren (2002) identified that electronic mail, chat rooms and web sites are good communications tools for collaboration of information. However, they have limited access and storage capability for growing a KM system. Since ''technology plays a key role in collecting and coding knowledge for distribution, it is important to have a strong IT framework to design and implement the systematic storage and dissemination of information'' (Smith, 2001, p. 318). There needs to be a robust and dynamic infrastructure to support business needs across the enterprise.

KM infrastructure

After all business requirements have been developed and information located, it is time to engage IT resources to help build the KM infrastructure. The KM infrastructure is composed of a data warehouse, content management, collaboration, and access tools. These tools help KM systems efficiently capture, share, and find information throughout the corporate enterprise systems. This ability is the key to the success of the KM system ''handle information and transfer it into knowledge'' (Honeycutt, 2000, p. 169). Laudon and Laudon (2003, p. 64) went further to explain that KM systems ''support processes for discovering and codifying knowledge, sharing knowledge, and distributing knowledge, as well as processes for creating new knowledge and integrating it into the organization.''

Organizations also standardize platforms across the enterprise to improve information and knowledge resource management. These use simple sharing and communications methods in order to integrate information across the enterprise. The outcome is easier information sharing to leverage knowledge to achieve a competitive advantage. Also ''standardizing document formats make exchanging important business documents simple and fast'' (Trepper, 2000, p. 206).

Data warehouse. Standardizing databases allow firms to exchange data between their employees and stakeholders no matter where they are located. Data warehousing can be described as a ''process that extracts data captured by multiple business applications and organizes it a way that is meaningful to the business'' (Duffy, 2001, p. 65). A database stores the organizational current and historical information extracted by KAs from various human and automated sources. A data warehouse utilizes query and reporting tools for extracting this information. Data mining provides a central source for management to analyze and report. It uses a ''variety of techniques to find hidden patterns and relationships in large pools of data and infer rules from them that can used to predict future behavior and guide decision making'' (Laudon and Laudon, 2003, p. 237). These systems can perform qualitative and quantitative analyses to determine trends and then drill down as necessary to determine the outcome. They support the ''transfer of operational data to the warehouse (i.e. data extraction, cleansing, transformation, loading, and administration) and warehouse management that support data management though multi-user database server applications'' (Duffy, 2001, p. 65).

Content management. Content management involves using tools and processes for maintaining documents. These tools allow users to easily ''create, publish, search, and manage information'' (Honeycutt, 2000, p. 111; Duffy, 2001, p. 66). Administrators use Web-based applications to integrate sources of information together and provide users access to a variety of corporate databases, directories, documents, and processes. These tools organize the information as objects to improve web-based applications access to information. Another aspect of content management includes the selection, preparation, and interpretation of the contents of large databases to identify novel and valuable patterns in the data'' (Laudon and Laudon, 2003, p. 352). The KAs will use this as part of their system maintenance.

Collaboration. Collaborative tools provide organizations with the ability to share customer feedback and ''best practice across global entities'' (Trepper, 2000, p. 206). The goal of collaboration is to ''create a basic, collaborative knowledge management system that supports sharing and reusing information.'' (Honeycutt, 2000, p. 170) Organizations need a growing number of capabilities that cover individual, team, departmental and enterprise productivity. These include applications providing electronic mail, discussion sessions, shared devices, group calendars, and schedules (Duffy, 2001). They provide a means for knowledge seekers to acquire information from experts. Collaboration applications also use profiling tools to allow searchers to identify the best information sources from others using these collaborative activities (Duffy, 2001).

Portals and access. Lastly, the KM system needs a means to provide users access to the knowledge base. A portal provides this access through a web interface into a company database or data warehouse. A portal consists of ''enterprise information portals (EIP), advanced searching tools, and web-based query to provide access to data'' (Duffy, 2001, p. 68). EIPs improve decision making and the productivity of users by providing an easy and user-friendly graphical interface. Its functionality includes access to data, classifying and searching data, and document collaboration. Laudon and Laudon (2003) defined enterprise information portal as an application that is a gateway to sources of information.

These portals use a cost-effective method of tiny programs called artificial agents, which find and organize the information instead of employees (Kotorov and Hsu, 2001). They provide an extension to our intellectual capabilities and help us find information faster. Portals are web-based displays that can be customized to the user and provide valuable information on marketing, customers, and products. They can also translate into giving an organization a competitive advantage. For example, having quick information on what customers need can ''trigger development of new products and services'' (Kotorov and Hsu, 2001, p. 87). Thus, knowledge can lead to innovations, creativity, and increased profits.

Establish collaborative processes

After identifying corporate knowledge, establish processes for sharing this information. By now, automated tools are in place but are no good without guidance. Trepper (2000, p. 163) stated that a ''good knowledge management process integrates people and technology with collaboration processes to create a smarter and more competitive organization.'' This information becomes available to all users across the enterprise regardless of their location. Honeycutt (2000) found that employees would use the system if they can access the information in a timely manner to support decision-making.

These processes also need to consider the company intranet as source for knowledge. For example, a simple directory can be a source of information on human expertise that can be easily accessible to others. Looking at what users need and how they search for information will help ''develop repositories to provide access to organizational expertise'' (Pemberton, 2004, p. 53). Another process will look at ways of creating new value to information through its reuse. This involves reusing some information from one event for another similar situation. These lessons learned prove invaluable when trying to avoid making the same mistake twice.

Van Beveren (2002) identified that knowledge already exists in organizations and is easily extracted by sharing best practices. Technology helps create repositories to store users' experiences and knowledge. However, some knowledge requires transcription into information that allows others to understand. This strategy would help firms manage what they know and locate the knowledge contained within its individual members' brains as required.

Recommend establishing knowledge communities composed of employees who possess knowledge and wish to share their ideas. These communities also provide a means of knowledge innovation where employees have an embedded knowledge of the company's values, preferences, and criteria, enough to be able to use their own creativity and innovation to focus and turn their own ideas into valuable products and services. Another important factor to consider is the affects KM collaboration has on product design. Honeycutt (2000, p. 35) summed it up as ''knowledge management empowers product design.'' This meant that the best products and services get to market by using highly integrated and professional teams with a single focus and goal. It also brings keen insight from various areas to produce faster results.

Managing knowledge inventories

Now that a KM system is established, the biggest challenge is how the users of the system will interact with the knowledge database. If they do not use it then all is wasted. Once a KM system is deployed it must be able to ''capitalize on potential reuse of ideas contained in documents and to support recognition and capture of insight resulting from relationships among various information elements'' Duffy (2000, p. 68).

Responsible companies must be proactive when ''managing and organizing their knowledge repositories'' (Duffy, 2000, p. 68). Therefore, establish detailed processes to maintain the enterprise KM system. Duffy (2000, p. 68) further illustrates that ''poorly organized, over-populated, or obsolete information'' will cause it to fall into disuse. Therefore, knowledge management repositories need constant looking after to prevent this from happening.

The CKO and KAs will regularly analyze customer usage and identify trends. They also review and manage content to ensure the information is current. These tasks will ensure that the KM system meets the company needs and is essential to its success. Honeycutt (2000, p. 193) identified that any ''unused or useless documents or other information should be removed by garbage collection services from the knowledge management information

base.'' Otherwise, this would clog up the knowledge database with useless information and make it unreliable. This ensures that only current and useful information will be stored, keep the database clean, and reduce costs in maintenance.

However, these actions do not control growth or disposition of documents. If left unattended, these repositories would grow out of control and collapse by the sheer volume of information. This requires companies to establish policies and guidelines for KM information. These include determining what to keep, devising how to organize them, and their life span or how long to keep them. The KM process focuses on the document content and not the physical document (Duffy, 2000). It utilizes the KM lifecycle of ''acquiring (capturing, buying, generating), organizing (classifying, indexing, mapping), retrieving (searching, accessing), distributing (sharing, moving), and maintaining (pruning, growing, nourishing)'' the contents of the repository (Duffy, 2000, p. 68). Pemberton (2004) adds that a KM system must filter out unnecessary information, establish annual reviews or evaluation to maintain currency, and implement policies and procedures for disposing of outdated material through destruction or archival repositories.

Training

An important piece of any KM system implementation is training people how to use it. A lack of training can be a barrier to any KM implementation project. Basically, KM systems must be easy to learn and use, otherwise they will find other ways to obtain knowledge (Dickelman, 2001). Thus, KM system training should include familiarization training on the system and processes (Riege, 2005). Training should be detailed enough to allow users to understand its advantages and limitations. One way is to show how easy the system can locate knowledge or colleagues who possess the knowledge. Another is to show how it can collect and retrieve information. Training classes should be done in the classroom and e-learning methods to allow all users to partake in the learning experience. E-learning provides an easy means for learning new technology through web-based learning tools (Ralph, 2003). Otherwise, users will be reluctant to use the new system.

Success factors

Stoll (2004) identified four key elements to introducing successful KM systems. First, start with a dedicated team that believes in the project and wants to see it through to the end. Next, get employee and management buy-in to KM through education and understanding of the benefits to individuals and the organization. Third, involves having patience because development of KM systems take time, involve labor, and affect organization priorities. Lastly, one must survey the staff before and after the KM implementation in order to gauge the project success against the baseline. The initial survey will provide a baseline of how people use knowledge. There are other factors to consider which include the available project funding. Sometimes one may have to develop the project over several years due to funding shortages. Another is set project goals and always be prepared for changes. No project can be successful without a target to shoot for and being aware of ice on the roads.

Conclusion

It is imperative that organizations recognize the wealth of knowledge in employees and seek ways to share this knowledge with others in order to obtain a competitive advantage. Smith (2001) supports these ideas by recommending that companies develop interactive and sharing environments for nurturing ideas. He also recommends the idea of a reward system to help encourage employees' participation. This will help build ''trust, openness and collective ownership'' in order to encourage the acquisition and sharing of personal knowledge (Smith, 2001, p. 320).

Honeycutt (2000, p. 3) clearly stated one of the main outcomes of KM is ''knowledge management turns experience and information into results.'' Not only does KM support companies need to have a competitive advantage but also has other advantages. These include: ''better organization and use of institutional knowledge; reduction of staff time used searching for information; less duplication of work; more efficient customer service; more time spent improving services'' (Stoll, 2004, p.56). These factors help contribute to a company's competitiveness in the marketplace.

This has been one example where business requirements have driven IT activities. Businesses must develop firm requirements based on sound business sense and utilize IT as support. However, there are other considerations such as money, time, and volume of information. These factors need to weigh in on any KM system and determine the scope of the project. In the end, a KM system can be simple to build if one follows the simple rules. These include involving stakeholders, carefully scrutinizing knowledge value, encouraging employee participation, and providing an effective and efficient KM infrastructure that can be accessed anywhere, anytime.

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