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Organizational Knowledge Management: Enabling a Knowledge Culture

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ABSTRACT

Many organizations are realizing the requirement for management of intellectual capital in today's global and information intensive economy. Knowledge management initiatives that are not supported by management or that do not have a knowledge sharing business culture will produce sub-optimal results and may fail altogether. A knowledge sharing culture is created through both management practices and organizational structure. In this article, a "knowledge culture" structure is presented that promotes the sharing, utilization, and creation of knowledge for gaining organizational competitive advantage.

INTRODUCTION

The worldwide economy has shifted from an industrial manufacturing/product oriented economy to one based on knowledge and services, where the principle commodity is information or knowledge. Effective management of intellectual capital is a critical issue facing organizations in today's global and information-driven economy. Knowledge management is not really about managing knowledge, but rather managing and creating a corporate culture that facilitates and encourages the sharing, appropriate utilization, and creation of knowledge that enables a corporate strategic competitive advantage.

The need for developing a "knowledge culture" is obvious for most service organizations (e.g., the product of a consulting firm, such as Accenture, is knowledge). Many service organizations are already performing knowledge management under the name of CRM (Customer Relationship Management), with large customer and product or service databases centered on content management (sharing, distribution, and utilization of knowledge). The need for increased efficiency and productivity produced by the downsizing trends in organizations during the downward trend in the recent economy is emphasizing the need for knowledge management, or a "knowledge culture", in manufacturing and retail industries as well.

Another motivation for examining the knowledge management methodology at an organization is the effect of corporate culture on new strategic initiatives. With the continuing globalization of the economy, organizations are facing increasing pressure to effectively manage their intellectual capital. Organizations that attempt to introduce a knowledge management initiative without having a managerial support structure will soon find that the investment in knowledge management does not produce any perceived benefits (Swan et al., 2000; Zammuto et al., 2000; Zammuto and O'Connor, 1992). Gold et al. (2001) state that organizational structure is an important factor in leveraging technology and more specifically that organizational structures must be flexible to encourage sharing of knowledge and collaboration across traditional organizational boundaries to promote knowledge creation.

Achieving a "knowledge culture" requires managerial focus in three areas: preparing the organization, managing knowledge assets, and leveraging knowledge for competitive advantage (Abell and Oxbrow, 1997). Preparing the organization is the first step in developing a "knowledge culture" and often involves changing the culture of the organization, changing the way employees work and interact. Organizational culture shifts are difficult to accomplish. Smaller organizations, 200 or fewer employees, and newer entrepreneurial organizations will have an advantage in making the prescribed culture shift over larger and older organizations that have a long history of corporate culture and a more rigid managerial structure.

BACKGROUND

Various taxonomies of knowledge and knowledge management exist (see Alavi and Leidner, 2001). For purposes of this article, knowledge is defined as any data, skill, context, or information that enables high quality decision making and problem solving to occur. Knowledge management then is any process (either formal policy or informal personal methods) that facilitates the capture, distribution, creation and application of knowledge for decision making. This decision making may be at the tactical level of day to day operations performed by an employee or at a more strategic level of developing organizational strategy by upper level management and every level of decision making in between. In other words, effective knowledge management makes sure that every employee (at all levels) has access to appropriate and the highest quality of information available at the time when a decision needs to be made. The "knowledge culture" is critical to the success of knowledge management within an organization as it signals a managerial commitment to knowledge management initiatives and promotes sharing of tacit knowledge for higher quality decision making.

Nonaka (1994) defines types of knowledge as tacit or explicit. Tacit knowledge is knowledge that is internal to a person, including cognitive learning, mental models, and technical skills. Explicit knowledge is knowledge that has been encoded into some media external to a person including paper documents, electronic databases and files, and the operating procedures of an enterprise.

Four tacit and explicit knowledge transfer mechanisms are found in organizations: socialization, externalization, internalization, and combination (Nonaka, 1994; Nonaka and Konno, 1998). Socialization is the process of transferring tacit knowledge to another individual who encodes the new knowledge in tacit form. Socialization may be performed informally, such as casual conversations around the coffee machine or lunch table, or more formally as in a mentoring program. Because of the personal nature of tacit to tacit knowledge transfer, traditional hierarchical management schemas do not promote this type of knowledge sharing.

Externalization is the process of encoding tacit knowledge into some explicit format, such as email messages or company correspondences. Internalization is the process of accessing explicit knowledge and then this knowledge is "learned" by the individual and becomes part of their tacit knowledge resources. Internalization necessarily adds context to knowledge as explicit sources such as a large organizational database are accessed and interpreted by an individual. Finally, combina-

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tion is the translation of explicit knowledge into a new explicit format and may include the addition of new contexts or simply changing the encoding format of the explicit knowledge. All three of externalization, internalization, and combination are facilitated by information technology research, such as wireless computing for distribution of information to facilitate internalization and voice recognition systems that would facilitate externalization of knowledge.

The "knowledge culture", described in the next section, enables flexible management of corporate knowledge assets that will facilitate both explicit and tacit knowledge sharing and utilization and consequently knowledge creation.

A KNOWLEDGE CULTURE MANAGEMENT STRUCTURE

Traditional hierarchical management structures, as displayed in Figure 1, allow vertical knowledge transfer through typical chain-of-command, but inhibit horizontal knowledge transfer that must cross the organization's functional boundaries. The development of knowledge teams composed of knowledge workers from cross-functional areas of the organization is a first step towards developing a fully distributed knowledge transfer system (both vertical and horizontal) within the organization. Cross-functional team members provide knowledge sharing, intended or indirect, from their knowledge team back to their original functional areas.

However, the scope of teams is limited to the organizational problem assigned to the team and results in limited knowledge sharing throughout the organization. The idea of teams and knowledge sharing must be extended to include all aspects of the organization. A knowledge team-based organizational structure is displayed in Figure 2. The knowledge organization of Figure 2 is composed of knowledge groups that are composed of knowledge teams, which are built from knowledge workers selected for participation on a knowledge team due to their tacit knowledge and skills. Ideally, the knowledge workers on any knowledge team come from different organizational (and educational) backgrounds and will bring a diversity of tacit knowledge and skills to the team.

Adoption of a new organizational structure (the "knowledge organization") or managerial methodology ("knowledge culture") faces resistance within the organization. Resistance to change may be minimized by reducing the perception of change for the stakeholders. The knowledge team management structure may be aligned to an existing hierarchical management structure by initially aligning the knowledge groups with the existing functional areas of the organization including: accounting, marketing, production, research. Knowledge teams or intermediate groups of knowledge communities are then aligned with the subdivisions within each functional area.

The recognition of individual personnel as knowledge workers will promote the development of new knowledge teams to address an organization's opportunities and consequently will facilitate the development of knowledge team communities that are diverse and more focused on a knowledge-oriented problem solving. Knowledge workers are expected to share and utilize knowledge with other team members to produce the highest quality decisions. New knowledge teams and groups will develop around product lines or other core competencies of the

Figure 1. *Traditional Organization Management Hierarchy (partial).*

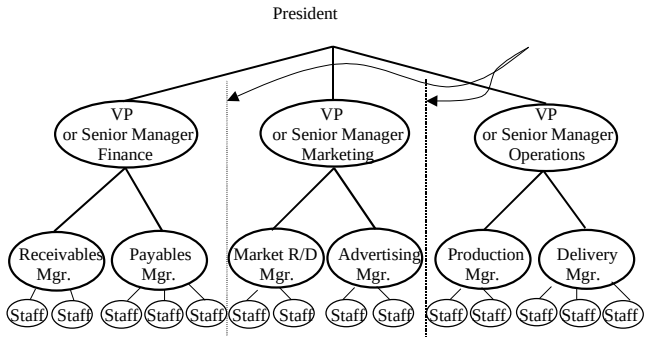
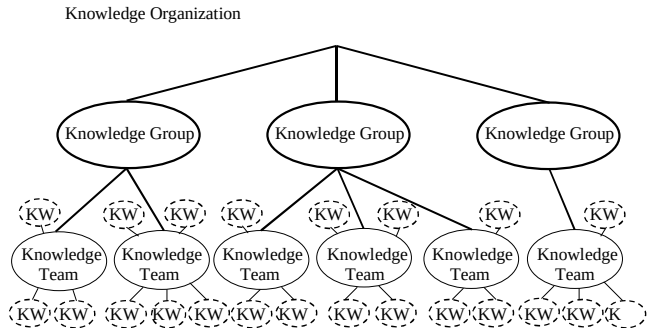


Figure 2. *Elements of the Knowledge Organization Hierarchy.*



enterprise. Knowledge teams should be created dynamically to take advantage of an organization's business opportunities or new business strategies.

Over time, the idea of an accounting (or other functional) branch of the organization will be replaced by communities of knowledge workers that have knowledge/expertise in accounting and may thus utilize other tacit knowledge to specialize in functional capabilities within a knowledge group. Knowledge teams that identify the need for specific knowledge (e.g., accounting or marketing) would then recruit knowledge workers that had the desired tacit knowledge to join the team (from a dissolving team that has already accomplished it's primary purpose or from a team that did not have a current need for the requested knowledge worker's tacit knowledge).

Knowledge gaps on a knowledge team are identified by performing a knowledge mapping process during team formation and whenever a new knowledge worker is added to the team. Since the knowledge organization is a community of knowledge teams and knowledge groups, the aggregation of knowledge maps for all teams serves as a knowledge map of the organization. The dynamic nature of knowledge teams and the strategic knowledge goal of knowledge creation imply that knowledge maps should continue to be performed every time a new knowledge team is developed to acquire newly created knowledge assets in the aggregated organizational knowledge map.

Motivating Employees To Adopt The "New" Knowledge Culture

Because the role of a knowledge worker may be a new role within the organization's culture, the development of a knowledge culture for sharing, dissemination, and utilization of knowledge will take some time. Motivating the desired knowledge culture and corresponding knowledge sharing behavior is facilitated through evaluating entire knowledge teams as a unit without reverting to individual praise or blame. Those teams that achieve a knowledge community approach to problem solving must be rewarded and acknowledged throughout the new "knowledge organization".

Another motivational strategy for the new knowledge culture may be based on rewarding the development of knowledge that is subsequently utilized by other knowledge workers or knowledge teams. Any knowledge that is externalized into explicit form or combined from one explicit encoding into a more useful format becomes eligible for a knowledge-use award (either monetary or other intangible benefits), but the awards are based on subsequent use of the new explicit knowledge by other knowledge workers. A similar approach can be used to encourage the internalization transfer of new knowledge by rewarding knowledge teams for incorporating explicit and tacit knowledge from other knowledge teams and groups (or even other knowledge workers) into their knowledge team solutions. Wiig (1995) discusses other standard management practices for motivating employees to become knowledge workers. The critical aspect of any motivation strategy with respect to the "knowledge culture" is that knowledge sharing within knowledge teams and across knowledge teams and groups is rewarded, not individual performance (which would lead to knowledge hoarding).

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Knowledge Creation And Assessment Within The "Knowledge Culture"

The knowledge organization management structure promotes the development of intellectual capital or knowledge creation in several ways. The "knowledge culture" community of knowledge workers will provide a diverse background of tacit knowledge and the combination of these various knowledge sources into a knowledge team enables the creation of new views, behaviors, ideas, etc. As stated above, knowledge teams are dynamic and should be formed to address specific business opportunities or challenges. Whenever a knowledge worker leaves one knowledge team and joins another, the knowledge worker takes all of the acquired tacit knowledge from the previous team, such as best practices or lessons learned. Consequently, the rotation of knowledge workers into new knowledge teams also serves to propagate the application of appropriate (best) knowledge into new business areas.

A key element of any knowledge management process model is assessment to evaluate the appropriateness or utility of knowledge owned and created (or acquired) by the knowledge organization. The knowledge culture method assumes that all knowledge workers are involved in the assessment process, since each worker utilizes different explicit and tacit knowledge assets. Knowledge workers within a knowledge team or group will provide consensus support for knowledge actions taken by the team and thus provide peer evaluation of all knowledge-based behaviors.

EVALUATING THE "KNOWLEDGE CULTURE"

The best evaluation of the knowledge culture and the knowledge organization management structure is empirical evidence by organizations that have implemented the knowledge organization structure. AES (Applied Energy Services) Corporation founded in 1981 with eight people, became the largest independent power producer in the United States in 1988, currently owns or has investments in 173 facilities in 27 countries worldwide and now employs over 10,000 people. The culture at AES Corporation enables and requires individuals to make decisions and the organizational culture adopts and supports those decisions. Individuals closest to the action make decisions for the corporation (AES, 2000).

A large percentage of AES people are active in new business development (AES, 1997). Decision making by AES's knowledge workers is supported through a team-based approach were team members advise and help educate decision makers with current knowledge (AES, 2000). Through the initial development of a knowledge culture and empowering knowledge workers within a knowledge team framework, AES has achieved continued growth in the power services industry.

Another example, but of a partial knowledge culture, is PRI Automation which produces advanced automation systems and software for the semiconductor industry. One of the core competencies of PRI is customer service. Field service representatives at PRI are the knowledge workers serving on various customer specific or product specific knowledge teams that form the customer support knowledge group. Field service knowledge workers use Palm VII palm PCs and wireless connectivity to access explicitly encoded performance support knowledge. The source of the performance support knowledge is encoded tacit knowledge from other field service knowledge workers and teams.

One of the ROIs that PRI Automation is interested in obtaining from its knowledge management initiatives is improved data accessibility. PRI estimates that malfunctions of its products may cost customers up to $1,000 of lost profit per minute and up to $100,000 per incident. Previously, PRI had relied on service manuals, which were out of date almost as soon as they were printed. By empowering their field service knowledge workers to access critical knowledge when and where it is needed (PRI uses Generation 21's TKM™ system), PRI has reduced typical data access times from 30 minutes to 5 minutes and increased the quality of the knowledge-based problem solving for a potential net ROI of $25,000 per incident (Mabe, 2001).

The PRI Automation case above shows that organizations can achieve competitive advantage through implementation of part of the "knowledge organization" structure. However, the gains from a partial implementation are still dependent on developing a knowledge culture that is organization wide so that knowledge workers are compelled to utilize appropriate knowledge for decision making. Larger organizations may select to implement knowledge teams within a single functional division or in multiple divisions, but temporarily not aggregate the knowledge teams into knowledge groups. These partial strategies will still result in performance gains if accompanied by the necessary cultural shift that encourages knowledge workers to share and utilize knowledge to improve the quality of their decision making process.

Various metrics may be used to evaluate the impact of the knowledge culture on the organization. Various authors (Edvinsson and Malone, 1997; Sveiby, 1997) discuss the problems of developing metrics for an abstract concept like knowledge, and tying it to organizational performance and suggest the development of intermediate metrics.

Some metrics would depend on the purpose for a knowledge team and the business domain and may include reduced customer service time or product manufacturing/assembly time, and increased customer satisfaction ratings. These metrics are concerned with the knowledge team productivity and the leveraging of knowledge. Metrics that focus on the "knowledge organization" management process will measure the overall effect on the organization through traditional metrics, but should also evaluate the development of tacit intellectual capital in the knowledge workers. Metrics that directly measure potential tacit knowledge increase would include increasing formal training and mentoring program completion, the number of times a knowledge worker can serve as a mentor, and number of successful knowledge teams in which the knowledge worker has participated as a member. Other metrics should seek to gauge knowledge worker satisfaction and would include a knowledge worker turnover metric.

The successes of various metrics in determining the impact of KM on organizational performance are still being evaluated. The metrics described above provide an initial means for measuring the effect of defining and implementing a knowledge culture for the organization, with supporting management structure and motivational strategies.

CONCLUSIONS

A critical issue in adoption of knowledge management initiatives is the preliminary preparation of the organization to accept, adopt, and utilize the new knowledge management process. Preparing an organization for knowledge management initiatives means changing or adapting the organizational culture to facilitate, support, and encourage the sharing, appropriate utilization, and creation of new knowledge. The resulting "knowledge culture" will maximize the competitive advantage realized from any knowledge management process.

The "knowledge organization" management structure, presented in this article, facilitates the development of a "knowledge culture" within an organization by first supporting the decision making of knowledge workers. Secondly by facilitating the exchange of tacit knowledge through interaction in knowledge teams with other knowledge workers (Nonaka and Konno's (1998) socialization process). Horizontal knowledge transfer is also facilitated as knowledge workers migrate to new knowledge teams working on new business opportunities or needs.

Two cases, AES Corporation that has a complete "knowledge culture" and PRI Automation that has implemented knowledge workers and knowledge teams, demonstrate the competitive advantages enabled through a supporting "knowledge culture." Additional recommendations for metrics are given that target the cultural aspects of a knowledge organization by measuring knowledge worker satisfaction and knowledge creation in addition to traditional financial metrics commonly used by organizations to measure organizational performance. Future research is needed to further investigate the relationship between degrees of "knowledge culture" within an organization and organizational performance.

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