
Management strategies for individual knowledge and organizational knowledge

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Abstract

In the present postindustrial society, knowledge has become a key resource. However, organizations face innumerable challenges in nurturing and managing knowledge. Unlike manufacturing activities, knowledge activities are difficult to monitor and control, because only a part of knowledge is internalized by the organization, the other part is internalized by the individuals. This duality between individual knowledge and organizational knowledge demands different sets of management strategies in knowledge management. This paper provides a framework that explores the differences between individual knowledge and organizational knowledge, and proposes a set of management strategies for knowledge management. The paper also discusses the ways through which an organization can transform individual knowledge into organizational knowledge.

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Introduction

In the present postindustrial society, knowledge has become a key resource of the economy (Bell, 1973). Faced with global competition and increasingly dynamic environments, organizations are being advised to assemble people of diverse talents and employ their expertise to gain access to new markets and new technologies. Large vertical organizations, which were once considered unassailable as a result of their huge technological infrastructure and physical facilities, have become inflexible in responding to volatile markets and meeting customers' demands in products and services quickly.

Managers in an array of firms are recognizing that to survive in complex and dynamic environments, organizations must be swift and flexible. In addition, organizations should be efficient in managing knowledge. However, a majority of managers are facing several challenges in understanding the practical aspect of knowledge management (Davenport *et al.*, 1996).

These challenges are occurring because traditionally managers have worked with physical and tangible resources. Based on long-term forecasts and future schedules on production, management used to allocate the resources. Also, traditionally, coordination of activities was facilitated through well-formulated rules, procedures, and plans. However, knowledge activities cannot be neatly decomposed, as professionals cannot be trained to perform diverse sets of knowledge activities. Professionals often possess expertise only in a few areas, because development of expertise takes years of training and practice (Simon, 1976). Second, traditionally, managers have found ways to monitor and control well-understood production processes, but there are no proven methods that managers can use in knowledge management.

Although a growing body of literature on organizational knowledge is evolving, a majority of studies are case-specific and most of these studies are normative in nature (Garvin, 1993). Moreover, a number of studies broaden the definition of knowledge management so much that they categorize "every successful organizational activity" under the purview of knowledge management (Davenport *et al.*, 1996). We believe these kinds of explanations run the risk of being



tautologies and do not provide any concrete guideline to practicing managers. We aim at clarifying some of these ambiguities and provide a framework between individual knowledge and organizational knowledge. The use of this framework enables managers to understand how different kinds of knowledge are conceptualized and managed.

Defining knowledge

Because of its intangible and fuzzy nature, defining knowledge precisely is difficult. What is knowledge for one person can be information for the other. Therefore, valuation of knowledge is risky, because productivity gain from “untried” knowledge cannot be guaranteed. Moreover, knowledge can be a liability if it does not provide the expected results. For example, presently, the majority of management techniques used by several firms are in stark contrast to the traditional management principles that once were perceived to increase the competitiveness of the firms. In the present environment, the use of these traditional methods has become a liability, as these methods have not been found to offer competitive advantages to the firms (see Nonaka and Takeuchi, 1995; Prahalad and Hamel, 1990).

Despite the difficulties in defining knowledge, it is well agreed that knowledge is an organized combination of ideas, rules, procedures, and information (Marakas, 1999, p. 264). That is, only through the “organization”, does information find its life and become knowledge. Quinn *et al.* (1996) equate knowledge with professional intellect. According to this view, organizational knowledge, at best, is a metaphor, as it is not the organization but people in the organization who create knowledge. Nonaka (1994) defines knowledge as justified belief, where beliefs are used to justify self-interests. This concept of knowledge is congruent with the “constructionist perspective”. In this perspective, actors are considered to enact and construct realities based on their mental models, which are shaped through interpretations and discourse between different members (Dervin, 1994). A part of knowledge, thus, becomes public – goods that are continually reexamined and reinterpreted by different social members (Raelin, 1997).

The other part of the knowledge still remains exclusively in the domain of the individual. This knowledge cannot be fully communicated, but only perceived by the individual (Polanyi, 1967; Nelson and Winter, 1982; Nonaka, 1994; Nonaka and Takeuchi, 1995).

To manage knowledge efficiently, a firm needs a highly flexible and adaptable organizational structure. For example, Prahalad and Hamel (1990) suggest that in present environments, organizations should structure on the basis of “core competencies”, because these kinds of structures are inherently dynamic and flexible and they can sustain high level of environmental uncertainty and chaos (see also Nonaka, 1994).

Knowledge management is thus a process of facilitating knowledge-related activities, such as creation, capture, transformation, and use of knowledge (Bhatt, 2000). The management process includes a range of activities ranging from learning, collaboration, and experimentation to integration of diverse sets of tasks and implementation of powerful information systems, such as Internets, intranets, and extranets.

Individual knowledge vs organizational knowledge

A number of researchers such as Weick (1978) and Simon (1976) believed that organizations did not have learning capabilities. It is rather individuals in organizations that learn. However, a number of researchers like Starbuck (1983) and Nelson and Winter (1982) propose that organizations evolve through their learning capabilities. Organizations learn and acquire knowledge through their routines and repertoires, which are embedded in specific organizational histories (Nelson and Winter, 1982). The way in which knowledge of diverse repertoires or routines is integrated and new knowledge is created is shaped by organizational history and culture (Barney, 1986). In this perspective, an organization is referred as a problem-facing and problem-solving entity. The learning that takes place in an organization is significantly affected by the complexity of tasks and the organizational environment.

We argue that individual knowledge and organizational knowledge are distinct yet interdependent. The extent to which each individual interacts with the other depends on the organizational culture (Bhatt, 1998). We take this view because in the present environment, individuals in the organizations need to make many quick decisions to resolve customers' problems. Instead of using rules and regulations as directed from the hierarchy, employees are forced to make many judgments to solve business problems efficiently (Stalk, 1988).

On the other hand, in complex situations, where organizational tasks are highly interdependent and individuals do not possess necessary levels of expertise to solve interdisciplinary problems, employees are required to collaborate with others to share their knowledge and expertise. By agreeing on common presumptions and analytical frameworks, employees can coordinate diverse sets of activities and solve organization-wide complex problems. Many of these kinds of tasks are confronted by professional firms, where each individual possesses expertise in a specific area, because of his/her educational background and work practice. As long as individuals in professional firms confront tasks that are within their areas of expertise, they can easily execute these tasks without requiring interactions with others. However, when the nature of tasks is complex, requiring integration of expertise from several interdisciplinary areas, individuals need high levels of interaction with others, besides being able to access organizational knowledge.

Although an organization can use individual expertise in seeking the solutions of organization-wide problems, it cannot claim its right on individual's knowledge. On the contrary, the organization itself becomes vulnerable to the mobility and idiosyncrasies of experts. Therefore, even after employing a number of experts, the organization may still not gain its full potential in solving organization-wide complex problems.

Sharing of knowledge for solving a complex problem is not synonymous with the decomposition of knowledge activities. What kind of knowledge is shared and how knowledge will be shared are determined by the professionals, not by the management. Moreover, unlike production-based activities, where almost all the specifications and

breakdown of activities are predefined in detail, knowledge activities are often unstructured and their specifications cannot be predefined in detail. The outcome of knowledge-intensive activities is uncertain. The success, however, often brings innovation and improvements. Therefore, knowledge sharing is a choice that is selected and used differently by different professionals. Unlike formal breakdown of work-structures as dictated by management, knowledge sharing is an informal and social process.

In other words, how professionals process and share knowledge becomes an expression of their personal expertise, experience, and creativity. Based on their expertise and experience, knowledge professionals decide with whom to interact, how to interact, and what knowledge to seek. Cappelli (2000, p. 104) argues convincingly this in following words:

The open competition for other companies' people, once a rarity in business, is now an accepted fact. Executives know that fast-moving markets require fast-moving organizations that are continually refreshed with new talent.

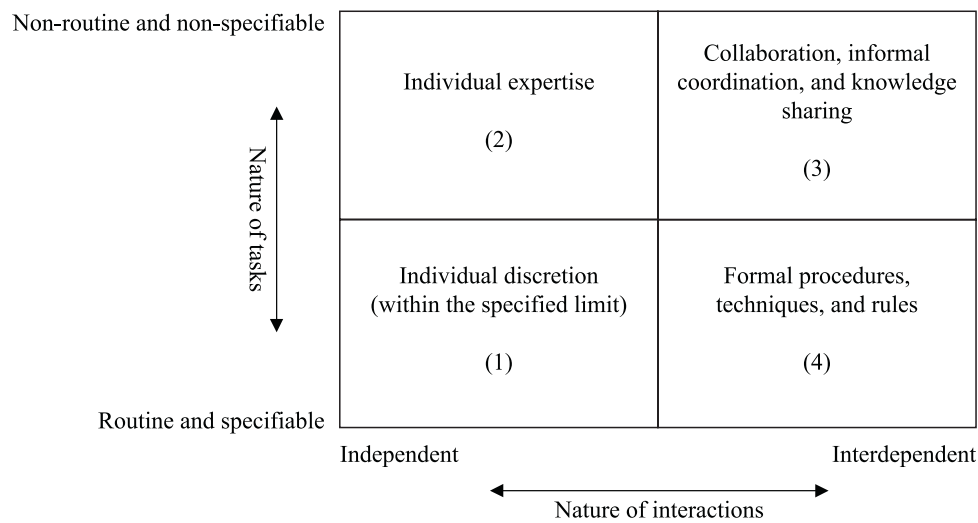
He further adds:

Today when an oil company wants to expand the sales of products at its service stations, it hires managers from Pepsi and Frito-Lay with expertise in retailing. When an airline wants to get better at managing customer relationships, it recruits executives from Marriott with experience in customer service (Cappelli, 2000, p. 105).

The above scenarios emphasize the importance of individual expertise. To better understand the relationship between individual knowledge and organizational knowledge, we propose a framework as shown in Figure 1. For discussion purposes, nature of interactions and nature of tasks are identified as two independent linear concepts, considered important in knowledge creation in the organization.

The horizontal axis in Figure 1 represents the nature of interactions that can range from low or independent to high or interdependent. The vertical axis represents the nature of tasks that can range from routine and specifiable to non-routine and non-specifiable. These two concepts provide the following four categories of knowledge:

- (1) *Cell 1*. In this cell, the level of interactions between employees is low and organizational tasks are routine and specifiable. Under such considerations,

Figure 1 Relationship between individual knowledge and organizational knowledge

an organization is likely to empower its employees to use their discretion. This is especially important in the present dynamic and turbulent environment, because the speed at which organizational problems are resolved produces the competitive advantages to the businesses (Stalk, 1988). In such environments, therefore, an organization is likely to empower its employees to resolve routine problems on the “spot” rather than ask them to direct routine problems upward in the hierarchy for scrutiny and solutions. For example, recently, some phone companies, such as AT&T, have started to authorize their operators to offer credits to customers on the “spot” because of misconnections or line cut-off.

- (2) *Cell 2.* In this cell, the degree of interactions is low and the nature of tasks is non-routine and non-specifiable. Not everyone in the organization is qualified to solve non-routine and non-specifiable tasks, as executing these tasks requires high levels of expertise. Therefore, frontline employees are advised to direct these non-specifiable tasks and problems to those people in the organization who are considered experts in specific areas. For example, British Petroleum (BP) has been found to connect to its drilling and hardware experts electronically, when faced with malfunctions of its drilling equipments. The high-resolution video camera provides a view of the malfunctioning parts of the equipment to the experts, who then can provide online solutions of the problems.

Getting advice from experts on specific problems and tasks is not the same as reporting non-routine and non-specifiable tasks to higher levels in the hierarchy. Traditionally, each organization devised a set of systems that enabled its management to take actions on exceptional cases. Presently, most of the activities require task-specific expertise that demands a high level of understanding of the tasks and their effects on the organization. Therefore, it is unwarranted to direct non-specifiable tasks upward in the hierarchy, because it only causes delay in solving the problems.

With the latest explosion of the World Wide Web, a number of firms are placing directories of their experts on the intranets, listing their names, expertise, and phone numbers. Similar to a *Yellow Pages* telephone directory, the directory of the experts can be used to connect employees with the group of experts for solving a specific problem.

- (3) *Cell 3.* In this cell, the degree of interactions is high and the nature of the tasks is complex. To deal with these kinds of conditions, employees need to continually share their expertise with others so that they can coordinate their tasks in unison. After all, the very existence of an organization depends on the coordination of tasks.

The organization, however, cannot dictate the rules of coordination and knowledge sharing. Since only a part of tacit knowledge is internalized by the organization, the other part is internalized

by employees. Therefore, it becomes critical for management to find some kind of commonality between individual and organizational knowledge and provide necessary incentives to employees to share their knowledge and enhance the contents of the organizational knowledge base. In highly dynamic and competitive environments, the kind of knowledge that is germane to a task cannot be easily specified. Therefore, employees often form their own informal communities of expertise from where they can get necessary pieces of knowledge. For example, professional groups in several organizations make use of on-line discussion forums and listserv to seek knowledge from outside sources.

Knowledge sharing is critical for those organizations which are large and geographically scattered in different locations. By sharing knowledge across different geographical locations, organizational members are likely to increase their knowledge and also bring forth a collective sense of realities, resulting the creation of “organizational knowledge”. Ernst and Young, one of the largest consulting firms, usually employs this kind of network among its employees for knowledge sharing and testing their presumptions on the novel problems faced by their client-firms.

- (4) *Cell 4*. In this cell, the degree of interactions is high and the nature of the tasks is routine and specifiable. In these conditions, organizations often follow formal rules and procedures. A majority of problems faced by traditional organizations belong to this cell, in which knowledge is specified through organizational routines and repertoires. The rules, procedures, and formal organizational structures ensure that an organization can efficiently coordinate its work-processes and tasks in an orderly manner.

Migration across the cells

Although we have argued that each organization can accomplish its tasks through four kinds of knowledge as shown in Figure 1, it does not mean that an organization will never shift some of its tasks and problems from an existing cell to other cells. In an environment where responsiveness has

become one of the main facets of competitiveness, a number of firms are transferring a number of tasks from cell 2 (which emphasizes individual expertise) to cell 3 (which emphasizes collaboration). In the early stage of an organization, experts play a critical role in responding to organizational challenges and problems, however, as an organization begins to grow and mature, relying on expertise is not an efficient means of dealing with the problems. One solution to deal with this kind of situation is through the use of collaboration among organizational members. The reasons for bringing people together to solve organization-wide problems are not based on economic issues alone, but a number of political issues also begin to challenge the management’s reliance on experts.

Role of organizations in creating organizational knowledge

Figure 1 shows that one of the main constituents of organizational knowledge is “interactions”. In an organization where the number of interactions between organizational members is kept to a minimum, most of knowledge remains in the control of individuals rather than the organization. However, a large part of knowledge is internalized within the organization through informal get-together and interactions between employees (Bhatt, 1998). In this interactive process, not only do individuals enrich their knowledge, but also make a part of knowledge available for the organization that is generated as a result of the interactions. In other words, the knowledge that is internalized within the organization is not produced by any of the organizational members alone, but created through their interactions.

Individual knowledge, if not shared with others, will have very little effect on the organizational knowledge base. Therefore, one of the important tasks for management is to facilitate the process of interactions between employees and make them sensitive toward environmental stimuli so that their individual knowledge is amplified and internalized to contribute to the organizational knowledge base (Nonaka, 1994). Knowledge “deviation” is important because this process brings forth new perspectives on the

individual's knowledge through validity checks, generated as a result of debates and critiques at the group levels (Weick, 1978).

Management strategies in knowledge management

Even though we have shown that expertise at the individual level is different from organizational knowledge, organizations cannot ignore the seriousness of harnessing individual knowledge. If individuals do not possess necessary skills and knowledge, their interactions are unlikely to create valuable "organizational knowledge" (Bhatt, 2001). So the goal for management is to encourage employees to continually refresh their knowledge base by interacting with those who possess work-specific skills and expertise. In Figure 2, we show how an organization can manage different kinds of knowledge, which we define as the process of creating, capturing, distributing, and using knowledge for the accomplishment of a task (Bhatt, 2000):

(1) *Cell 1.* In cell 1, the main challenge for management is to empower its employees. In this cell, because employees face routine problems, they can gain quick understanding of the problems and their solutions through work related training. However, the degree of "discretion" needs to be determined on the basis of individual work-experience and rank. Also, management should provide broad

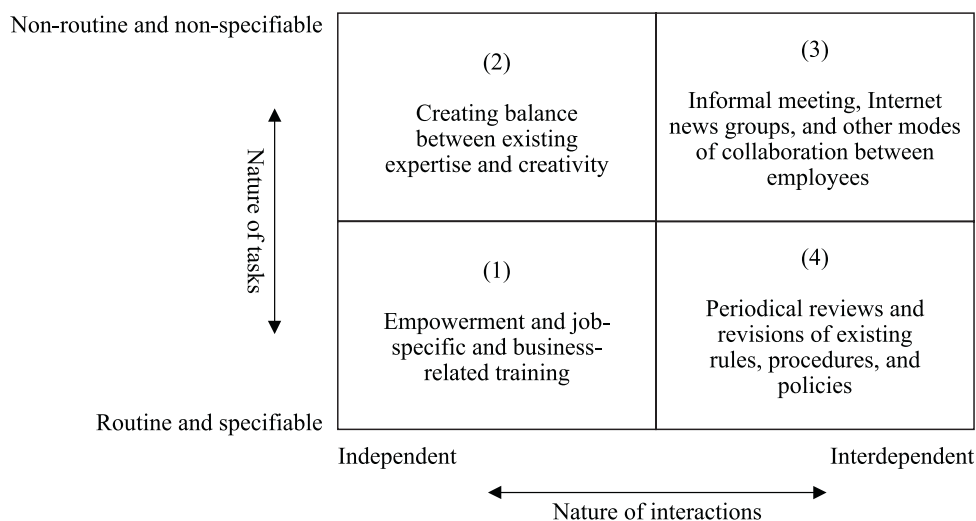
guidelines under which employees can use their discretion. Once employees become clear about their responsibilities and authority, they are likely to make prudent use of their discretion.

The other goal that management should pursue is to train its employees so that they can deal with routine work-processes and tasks. The employees should not only be taught task-specific skills, but also be trained to understand the "hidden" realities of doing business in the present dynamic and competitive environment. Courtesy towards customers, accuracy and timeliness of responses to customers' inquiries, and responsiveness to customers' demands should be considered critical in obtaining honest feedback from customers so that management can reevaluate the level of employee-discretions and act accordingly.

(2) *Cell 2.* In cell 2, the main goal of management should be to motivate and nurture the expertise of its experts. The management should not only challenge experts for higher levels of expectations, but also encourage and reward them. The other route that an organization can take is to hire bright individuals and motivate them for handling organizational responsibilities.

Because experts are highly mobile and idiosyncratic they seek freedom in carrying out their tasks. It is crucial for management that it carefully balances the needs of the organization and the creativity of the experts. Often, experts

Figure 2 Knowledge management strategies



run their own agenda and do not pay attention to organizational mission, goals, and strategies. At the same time, experts cannot be commanded that they should use their expertise for the organization. Therefore, management needs to determine the ways through which it can balance the needs of the organization, i.e. exploitation of experts' knowledge, and the desires of experts, i.e. exploration of new knowledge. Microsoft, a premier software company, has been found to efficiently manage this kind of dilemma in knowledge management. It not only encourages its experts for risk-taking, but also sets concrete guidelines on resources, schedules, and usability of the projects that experts intend to initiate.

- (3) *Cell 3*. In cell 3, the use of self-organized teams and social interactions are considered conducive to enhancing the richness of the organizational knowledge base. The emphasis on multiple interpretations not only brings new realities, but also renews organizational commitment to replenish the contents of the organizational knowledge base (Nonaka and Takeuchi, 1995). The process of multiple interpretations on "knowledge" is important as it allows individuals to revise, reshape, or modify their belief systems in relation to others (Bhatt, 2000).

In order to enhance interactions between employees, an organization can use a wide variety of divergent perspectives, including brainstorming, dialectical thinking, and continuous experimentations (Bhatt, 1998). By bringing forth multiple perspectives on knowledge, an organization becomes much more sensitive to environmental stimuli to understand the realities of the marketplace. Moreover, multiple perspectives enable organizations to assess the applicability and the risk of using a particular kind of knowledge in various situations.

Management's role in creating a "nature" of collaboration is important because complex organizational tasks require deeper analysis of the problems. Moreover, implementation of organization-wide solutions requires commitment from employees. If employees' views and perspectives are not

being taken into account in seeking the solutions of the organizational problems, the organization is likely to suffer from implementation problems. Hewlett-Packard (HP) and 3-M are well known for creating collaborative environments in their organizations to facilitate easy networking and knowledge sharing among employees.

- (4) *Cell 4*. In cell 4, the main challenge for an organization is to store and codify rules and procedures in simple format so that employees can easily access and understand them. If rules and procedures are not stored and written clearly, each employee is likely to follow his/her own interpretation of the rules. However, when rules and procedures are clearly marked down, there is far less ambiguity in understanding and interpreting those rules and procedures. Automation and standardization of tasks and schedules are common means of handling this kind of situation.

The rules and regulations for carrying routine tasks do not remain the same throughout the life of an organization. When external environments begin to change drastically, it is important that management carefully reviews the significance of existing rules, procedures, and policies. If existing rules, procedures, and policies do not fit to the current state of business realities, management should seek and devise new sets of rules, procedures, and policies. In other words, reviews and revisions of rules, procedures, and policies become one of the main goals of the firm to keep abreast with changing realities and new knowledge. A number of quality improvement initiatives undertaken by several firms come under this category.

Implications

In the present dynamic and fast environment, the need for organizational knowledge is clear. In several situations, however, the application of individual knowledge and expertise becomes critical. This depends on the nature of tasks and the nature of interactions between individuals. If a task requires specific expertise, a specialist can use his or her own knowledge to solve the

problem. On the other hand, if a task requires the application of knowledge from different areas, individual expertise in itself may not be a solution of the problem. In this case, how organizational members interact and collaborate to share their knowledge becomes much more important.

Also the extent to which a task is considered specific or non-specific depends on the existing organizational environment and management's willingness to empower its people. For example, in a university setting, until a few years ago teaching assistants were guided by the university professors on how they should teach, what kinds of course contents they should cover, and how they should grade the students. But with increasing pressure in research and publications, a majority of professors are no longer interested in providing any serious guidance to their teaching assistants. Rather, professors have given their teaching responsibilities to the teaching assistants. Therefore, for teaching assistants "teaching a class on his or her own" has become a norm. Now, teaching assistants decide what contents to cover and how to grade their students.

However, often, individual expertise is not sufficient. For example, designing and writing complex software programs require the use of many experts who work with different modules and applications. In this case, organizational culture and interaction patterns among experts become crucial. Or take the case of developing a new product for a company. In this case, organizational knowledge is far more important than the individual expertise possessed by marketing, manufacturing, or R&D people. For the successful launch of a product, assimilation of cross-functional expertise and collective learning become important (Prahalad and Hamel, 1990).

A number of researchers argue in favor of empowerment. They contend that if individuals are empowered, they begin to take extra responsibilities to solve organizational problems by learning new skills at the jobs. This could be correct for specific tasks, as they may be solved with minor adjustments. But we caution that empowerment does not necessarily lead to "better results". Individual training and nature of tasks are main factors that impact on the results of the empowerment. For example, routine tasks,

such as checking customer credits, billing, and other inquiries, can be easily assigned at the individual levels. However, when an organization faces nonspecific tasks, the collective learning and quick interactions between pools of employees are likely to be useful to solve the problems quickly.

We understand that individual knowledge is a product of social interactions, created in a socially constructed culture. However, this discussion is beyond the scope of this paper. Our main goal is to emphasize that individual knowledge is as important as organizational knowledge and the relative importance of both depends on the nature of tasks, the level of individual training, and motivation, and management's willingness to abdicate some of its traditional responsibilities to the lower level employees.

Conclusions

In the present turbulent environment, organizations have seen a shift from contemporary approaches of strategy to the internal resources of the firms in explaining the advantages in firms' performance (Barney, 1986; Prahalad and Hamel, 1990; Teece *et al.*, 1997). Central to the theme of the resource-based view is the role of organizations in developing and deploying scarce resource capabilities, which cannot be easily imitated.

In this perspective, knowledge is considered a key resource, but many organizations still do not know how to manage knowledge. A few organizations, such as Federal Express, Hewlett-Packard, and 3-M have learnt to leverage knowledge for their competitiveness, but a majority of organizations are still facing innumerable challenges in capitalizing on knowledge.

This paper argues that a part of knowledge is public and the other part of knowledge is private. Although an organization can monitor and control public knowledge, it finds it difficult to control private knowledge. One way through which management can manage private knowledge is by creating an environment of collaboration and informal coordination. In so doing, an organization not only deepens its employees' knowledge but also creates new organizational knowledge. Through participation and cooperation, an organization establishes a shared-schema to

replace old knowledge with the new one that becomes necessary for continuous improvement and breakthrough innovation (Weick, 1995).

This paper proposes that individual knowledge and organizational knowledge are distinct yet interdependent. Individual knowledge is often expressed through personal creativity and self-expression. Organizational knowledge is reflected in products and services that an organization creates and sells to its customers. Individual expertise in an organization is an asset, however, if management does not nurture individual expertise carefully, individual self-expressions become organizational liabilities. Therefore, management should create an environment that encourages its employees to collaborate to share knowledge. This results in enhancing employees' knowledge and creating organizational knowledge through individual interactions.

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