

Information Technology and its Deficiencies in Sharing Organizational Knowledge

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Abstract

Indeed, one of the effective technological factors leading to an organization's successful deployment of knowledge management strategy is the development of proper IT infrastructure. Yet it seems IT management has substantively surpassed individuals' ability to mutually understand and agree upon their desired information and its sharing. This is so, because, despite the amazing improvements of information technology in recent decades, and its omnipresence in organizations, the improvements in the field of knowledge sharing were insignificant. In the present paper, it is discussed that despite the claimed knowledge sharing resources and the certain and ever-growing capabilities of ICT for sharing knowledge in organizations, still knowledge sharing is extremely difficult. The motives for sharing, or maybe more importantly, the motives behind refusing to share knowledge should be understood on the basis of correct organizational image. Thus, the article reviews the political and cultural perspectives of organizational functions and compares these two. In addition, the roles of informal networks in knowledge sharing are examined.

Keywords: Information Technology, Knowledge Sharing, Organizational Culture

1. Introduction

In today's organizations, information or more specifically knowledge is regarded as one of the most important strategic resources; moreover, organizational capabilities are based upon the distinct competencies in sharing and integrating information and knowledge. However, most knowledge sharing attempts and systems fail. Even in the many cases where no IT or technological deficiencies involved, the goal of sharing is rarely attained and even achieving relative success is not easy (Hislop, 2002). Innovation and rapid change is the unique characteristic of this new millennium, often referred to as the age of information. Organizations of this age are faced with the major challenge of dynamic stability at all different levels. It could be said that this new age is like a stage for organizations that have been able to take control of the amazing capabilities of knowledge and use them to gain progressive competitive advantage. Today, organizations are faced with such extensive amount of information and knowledge that managing and using them correctly has become one of their major concerns. Managers of knowledge based organizations use IT as a motive force and an effective tool to achieve and improve knowledge management as well as overcoming challenges.

Knowledge management, the process of creating wealth and value using mental and knowledge based assets, requires a system to support this process. IT, as the most enabling factor of knowledge management process, has significantly improved the execution of this process with its high speed and precision. The creation of knowledge signifies organization's ability in creating new and useful ideas and solutions. Just like information system, knowledge management has its roots in other fields. The richness of these two new majors is, at least partly, because of the multiple viewpoints of numerous learning branches used in the study of efficient application of information and knowledge in organizations (Hackney et al., 2000). Since the researchers and users of this field debate over their viewpoints from basic definitions to very complicated matters, there has been much hot discussion regarding IS (Information System) and KM (Knowledge Management). This is not necessarily a bad thing, since very often as a result of such wide but creative debates new understandings and creative solutions evolve.

2. Organizations and Sharing Knowledge

Generally, organizational knowledge should be applied in accordance with the products, services, and processes of an organization. If an organization fails to clearly define the right form of knowledge at the right place, it will face problems on competition grounds. In today's world, creativity and innovation pave the way to success and thus an organization needs to apply the right knowledge at the right time. To guide individual knowledge toward organizational goals, organizations should create an environment of knowledge pooling, sharing, and transferring among their members. Generally, ICT has made the work environment of man more complex and has defined new tasks for him. In such context, traditional processes face limitations and meta-cognitive thinking is subjected to further studies. With vast applications of ICT in performing routine and preplanned tasks, human dynamic and creativity in organizations have changed course toward a cross disciplinary of joint activities. According to Daneshar (2003) in such context, individual knowledge is not the only important issue, but also belief sharing, and how, when and with whom this belief and knowledge is shared are also equally important.

Despite the claimed knowledge sharing resources in organizations and the certain and ever-growing capabilities of ICT for making it possible, still knowledge sharing is extremely difficult. For example, over a decade ago Davenport stated that: "The rhetoric and technology of information management have far out-paced the ability of people to understand and agree on what information they need and then to share it [so] the information-based organization is largely a fantasy" (Davenport et al., 1992), and it must be noted that since then condition hasn't much changed. By mentioning e-commerce projects management, Kendall & Kendall (2002) maintain that organizational policies should intervene since units often feel they should protect their data and as a result they don't realize the need to share the data within the organization. It is clear that the motives for sharing, or maybe more importantly, the motives behind refusing to share information and knowledge should be studied more. But its realization must be based upon correct organizational theory or image (Morgan, 1997). Theories like political and cultural perspectives of organizational functions.

An organization in its life cycle goes through different stages from birth to growth and maturity. During this passing, the structural change happens in the organizational change and development center. Authors have classified the changes in organizational structure in different ways. Each of them has observed the impact of one of the various content factors such as environment, strategy, technology and etc. and has introduced a new structure based on the observations (Robbins, 1990). In the following, political and cultural perspectives are examined. Table (1) summarizes these two, and compares them from different viewpoints. Despite the amazing improvements in software section of information technology in recent decades, and its current omnipresence in organizations, the improvements in the field of information and knowledge sharing were insignificant. Published works in this field consider several factors responsible. These factors could be placed in two major categories:

- The lack of attention to the cultural infrastructure of organizations – the main cause.
- Issues relating to organizational ownership, trust, power and policy.

Table 1: The comparison of cultural and political perspectives of organizations

viewpoint	cultural perspective	political perspective
organizational work sharing and integration	in order to coordinate and integrate organizational work knowledge sharing is essential.	organizational work integration is best accomplished by compulsory and optional sharing of knowledge
mutual identity and understanding	knowledge sharing makes mutual identity and understanding among members possible and is also supported by them	context is the only thing that matters; mutual identity and understanding are unattainable ideas except in rare cases
organizational sharing and aligning	sharing information and knowledge results in alignment of individual goals and creation of a common goal among all members of the organization	information and knowledge is shared between those members of the organization whose goals are thought to be in alignment with each other
sharing and organizational culture and policy	information and knowledge sharing depends upon the culture of the organization, culture must recognize the sharing and prevent political problems	cultural change is a wearisome process, and in any situation sharing is attained by organization's motives and assessments rather than its cultural characteristics
reluctance to share	inevitable motives (e.g. personal gain, power and policy) hinder knowledge sharing	reluctance to share knowledge could be caused either by the anxiety for organization's better performance or some inevitable motives
sharing approach	extensive and efficient sharing of knowledge is attained by better realization of organization's mission, definition of system requirements, and the creation of internal sharing culture	facilitating the sharing and allowing the staff to choose when and with whom they share is a solution to the problem of sharing

2.1 Organizational Culture Perspective

It is common belief that creation of individuals and organizations required information and knowledge management systems, and the effective implementation of such systems basically means the realization of work routine of individuals in the cultural context of an organization (Ahmed et al., 2002). But first, it deems essential to briefly define “organizational culture”: Schein defines organizational culture, or what he more comprehensively calls ‘The culture of a group’, as “A pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems” (Schein, 1997). Other definitions in the field generally have forms similar to the aforementioned. They mostly signify subjects such as common values, fundamental assumption and beliefs, common norms, functions, icons, and realization of groups or organizations which is imparted to the new comers through the process of socialization (Jordan, 1993).

Through common culture, staff would describe their perception of the world, define important items, and exploit the environmental resources in the same way. The knowledge of such common perspective about work area and self-role, results in making efficient communications, building trust, and mutual understanding. It also improves the knowledge sharing efficiency as well as the working and learning processes of the staff. Information and knowledge sharing in turn result in positive feedback, identity support, and common perception. Information systems provide the means for sharing information and knowledge; consequently, people can find and access the information they need and use it at the due time. Since the environment of most organizations comprises various dimensions of uncertainty, dynamism, and independence, a strong need for a more efficient utilization of information and knowledge systems is recognized. This indicates the importance of better analysis of user requirements, and the understanding of organizations’ work culture by these systems. Improvement in this field originates from correct organizational culture and allows the creation of staff adaptation systems for sharing the required information and knowledge. Such systems allow the individuals to communicate based on their own perception rather than preinstalled systems. The nature of organizations, their activities, and the problems they encounter are always dynamic; but unfortunately static systems are still ordered for such organizations (Warne et al., 2004).

It is noteworthy that adding information systems is not the permanent solution to the problems. In order to determine that an organization values cooperation and group work, first a cooperation and sharing culture needs to be established and motivational programs must be designed to reward teams instead of individuals. Nonaka & Takeuchi (1995) maintains that only a small minority of people have the capability to easily share their knowledge. The two potential attitude-behavior related employee issues are: 1. How to prepare the employees for sharing the knowledge they possess. 2. And how to overcome the resistance against knowledge sharing in organization. McDermott suggests that in an organization with knowledge sharing culture, people would share their ideas and knowledge with others because they treat this as a natural process rather than being forced to do so. However, in large organizations individuals prefer to treat knowledge as a source of power rather than seeing it as an organizational resource.

Indeed, one of the effective technological factors leading to an organization's successful deployment of knowledge management strategy is the development of proper IT infrastructure. Internet, intranet, email, fax, and video conference are examples of ICT applications in knowledge based organizations – which are evolved to electronic organizations from this aspect. Implementation of IT decreases the limitations of communication caused by hierarchical levels. Employees would be able to promptly communicate with anyone, anywhere, and at any time they want (Farhangi et al., 2005). Such technologies have enabled knowledge based organizations, and are regarded as the most effective means for acquiring, storing, transferring, and disseminating knowledge.

2.2 Organizational Policy Perspective

Classical organizational theorists and to a lower degree those who belong to the cultural school of organizations believe organizations usually follow “the philosophy of trusting and supporting other members” (Kakabadse et al., 1984) and organizations lacking this characteristic would dysfunction. But the theorists of organizational power and policy perspective reject this hypothesis and emphasize that “power is a part of organizational behavior” and effective implementation of power, regarded as a political action, guarantees the achievement of organizational as well as individual goals through most or even all organizational activities (Fairholm, 1993). The image of organizational policy and power perspective comprises a collection of groups and individuals with various goals, beliefs, values, desires, and understandings; thus, from this aspect, it is compatible with cultural perspective. However, it also maintains that belief differences, if not norms, are common in organizations.

Coalitions establish and demolish; and differences, disputes, and political activities are natural and inevitable part of organizational life. Furthermore, organizational scientists have different ideas about what makes the political behavior. Some of them describe organizational policy as the behavior of interested parties in using power for affecting the decisions, while others emphasize the importance of non-sanctioned and self-served nature of individual behaviors in organizations. And even some others refer to organizational policy as a social process which has potential positive function or dysfunction, and or simply influence management (Ferris et al., 1989).

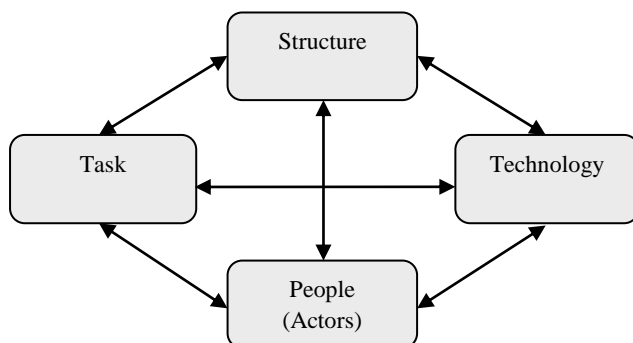
3. Diamond Organizational Model

Leavitt's diamond (see Figure 1) presents a balanced and rational view toward complexities affecting KM framework. It also views technology in direct and strong relation with required tasks, employees, and task organization i.e. structure. This model has been widely used as the basis for understanding and realizing organizational changes.

Leavitt's diamond (1965) demonstrates four groups of organizational variables: task, people, technology, and structure. As the arrows in Figure (1) indicate, Leavitt states that these variables have many transactions with each other. Thus, changing one of them would result in regulatory and compensating change in other components. Technologies are tools that help organizations perform their tasks and help mechanisms turn inputs into products.

Knowledge management is not just about management of knowledge work processes or people performing them, since it influences technology and organizational structure as well. The position researched by this framework suggests that only with the consideration of balance among all the four variables it is possible to demonstrate the activities of knowledge management in an organization. Therefore, instead of disregarding the importance of these variables or ignoring one of them (e.g. technology) all together, this framework views all the groups and elements equally and puts all the variables in priority; in this manner, the activities of knowledge management could reach maximum success.

Figure 1: Diamond organizational model (Leavitt, 1965)



4. The effects of information technology on knowledge management

Information technology is much wider and more indefinite than computer science. This term replaced 'management information systems' and 'data analysis' which were common during 1960s and 1970s. Information technology usually refers to acquisition, processing, storage, and dissemination of information in large organizations. Despite several commonalities, computer science and IT are different concepts. Computer science to IT is like mechanical engineering to transportation industry. Transportation industry includes vehicles, trains, ships, and aircrafts all designed by mechanical engineers. Whilst transportation industry also deals with issues such as, navigation management, traffic management, and determination of transportation strategy on corporate, city, and country level, none of which has direct relationship to mechanical engineering but ICT definitely plays a decisive role in all of them.

Information technology has been defined by the 'Information Technology Association of America' as being 'the study, design, development, implementation support and/or management of any computer based information systems'. In summary, Information technology deals with using electronic computers and software to convert, store, protect, process, and retrieve information in a safe and secured manner. Recently, this definition has slightly altered to explicitly include the area of electronic communications as well. Thus, more people prefer to use the term 'Information and communication technology' instead. In companies that gradually become systematic, knowledge might be generated by informal and self-organized networks. Science communities, in which informed individuals are gathered by common interests, are usually based on face to face, telephone, and or email and social network conversations.

The significant recent advancements in information technology have opened new possibilities for the process of knowledge management. Tools such as data banks, decision support systems, and the evolving of electronic performance support systems have greatly contributed to the knowledge management. By acquiring and storing new knowledge, the ever growing number of personal computers and social networks open better competitive position possibilities for organizations. Social network establishes connections among geographically distant individuals with common goals, and shares and integrates their creativity and ideas beyond boundaries of time and place. Ease of access and acceleration in sharing information are the greatest values information technology creates for knowledge management. Information technology allows the extraction of knowledge from the mind of the knower. Then, with the help of technology, this knowledge could be placed in regular formats and transferred to other members, and trade partners of the organization throughout the world; it also helps the encryption and in some cases, the creation of knowledge as well.

Information technology grants Knowledge management systems two major abilities: firstly, it enables them to create expert or decision support systems. Secondly, it provides quick communications for individuals with specialized expertise and facilitates the exchange of information among them.

Information technology can affect knowledge management in different ways:

- IT facilitates fast knowledge acquisition, storage, and exchange in a way that has never been possible before.
- IT integrates and unifies the separately functioning components of knowledge. This unification removes the obstacles on the way of communication between various divisions of an organization.
- IT improves all the methods of knowledge creation, transfer, storage, and implementation.

5. The Role of Informal Networks in Knowledge Sharing

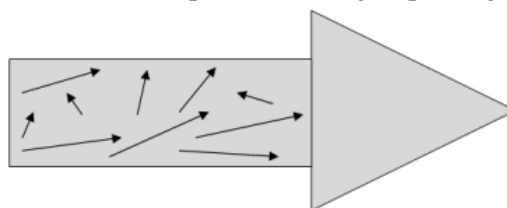
According to Peter Senge, systemic thinking requires a change in the way of thinking. That is to consider oneself connected with the organization rather than detached from it. The existence of such thought is closely related to the nature of organizational culture. If the culture of an organization sustains such thought, the result would be a considerable amount of interactions and knowledge sharing among personnel.

Both individual and social networks are prominent tools for acquisition, dissemination, and sharing of information and knowledge. Furthermore, people present in the network could share their knowledge, expertise, and experience with others. So individuals would have access to multiple knowledge resources and could exploit them when facing problems. As a result, it seems impossible to imagine individual and separate activity. But then again, it must be emphasized that the founder of such networks and the supporter of their interests is the support organizational culture which is mutually strengthened by these networks (Senge, 1992).

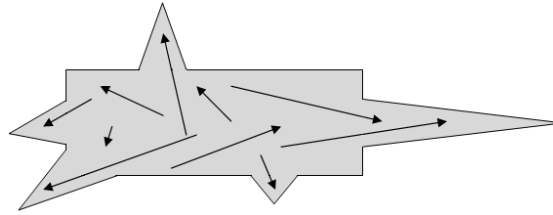
Senge (1992) regards the five disciplines of systemic thinking, personal mastery, mental models, building shared visions, and team learning as the fundamental distinction of learning and traditional organizations in domination and superiority. He believes that team learning is a process of aligning the goals of group members in a way that the final result would be what all the members really desired. This learning is based upon a single principle; that is the principle of common goal. Meanwhile, personal mastery is the other major factor; although common goal and personal mastery are not sufficient by themselves.

Despite its relationship with personal capabilities and individuals' ability to understand, team learning is essentially considered as a group system. If we picture a team as a group of individuals with different degrees of personal power, with each of them using his power in a different direction, the result would resemble Figure 2.

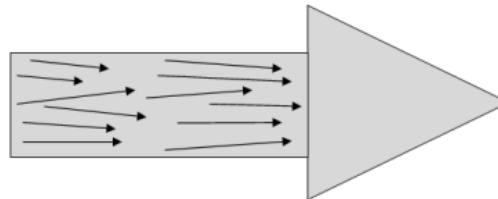
Figure 2: Personal capabilities in a group (Senge, 1992)



Alignment is a prerequisite, if empowering each individual is to strengthen the group. When there is a lower level of alignment, strengthening the individuals would make the situation and management more difficult. As shown in Figure 3, loss of energy is the common feature of misaligned groups.

Figure 3: Empowering personal capabilities without creating alignment in the group (Senge, 1992)

The best condition is when groups are perfectly aligned. In this case, a common direction would be defined, power of individuals would be in coordination and harmony, and less energy would be wasted. None of the individuals would resign their personal desires and interests to the group viewpoint; rather group vision means expansion of their own personal vision. This phenomenon is depicted in Figure 4.

Figure 4: Coordination and harmony in personal capabilities of group members (Senge, 1992)

Apart from satisfying social needs, informal networks play a pivotal role in the dissemination of knowledge. New knowledge is often born as a result of making individual knowledge accessible and this is the most important activity of knowledge creating organizations. Technologies such as email, fax, and telephone are invaluable assistive tools in the process of information and knowledge sharing. But these tools are merely accessories. Sharing depends on the quality of formal and informal conversations of people, and it is the organizational culture that decides how and among whom these conversations happen (Warne et al., 2005). As Webber says “Conversations -not rank, title, or the trappings of power- determine who is literally and figuratively ‘in the loop’ and who is not” (Webber, 1993).

6. Information Technology and Knowledge Sharing

The role of technology is to create the right and proper culture for sharing information and knowledge. Organizational culture that appreciates the value of knowledge and its sharing has a very significant role in successful transference of knowledge. Such culture creates the opportunity for personal contact so that tacit knowledge could be transferred; the type of knowledge that couldn't be grasped efficiently and is not easily stored in documents and databases. In a culture that values knowledge, managers not only realize the importance of knowledge creation for occupational success, but also they appreciate its capability in developing at time and place (Davenport & Prusak, 1998). On the other hand, weak will power and its consequences on sharing information and knowledge have always raised theories regarding lack of motivation realization or the work schedule of more experienced personnel (Warne et al., 2005).

Lack of understanding not only affects will power, but it has influence on trust, organizational consistency, goals alignment, common identity, and consequently opportunities and motivations for learning and innovation and general creativity as well. Eventually, although beyond doubt in most organizations there are people motivated by personal needs, power, and policy, who even get corrupted and tainted as they attempt to reach their personal goals, still this incident couldn't be generalized. On the contrary, most people enjoy working in groups toward attaining common goals; and if the proper environment (organizational culture) and tools (e.g. technologic systems of information and knowledge management) created based on real needs and through efficient analysis of needs exist, they will eagerly share their information and knowledge resources to resolve organizational problems and make affairs more lucrative (Warne et al., 2005).

7. Conclusion

Since the environment of most organizations comprises various dimensions of uncertainty, dynamism, and independence, a strong need for a more efficient utilization of information and knowledge systems is recognized. This indicates the importance of better analysis of user requirements, and the understanding of organizations' work culture by these systems. Implementation of IT has relatively impeded the limitations of organizational communication caused by hierarchical levels. Information technology grants knowledge management two major abilities: the ability to disclose knowledge and the ability to create fast connections among knowledge channels. On the other hand, informal individual and social networks are among important tools for the acquisition, dissemination, and sharing of information and knowledge.

But also it must be noted that the founder of such networks and the supporter of their interests is the support organizational culture which is mutually strengthened by these networks. Also sharing depends on the quality of formal and informal conversations of people, and it is the organizational culture that decides how and among whom these conversations happen. It is noteworthy that adding information systems is not the permanent solution to the problems. In order to determine that an organization values cooperation and group work, first a cooperation and sharing culture needs to be established and motivational programs must be designed to reward teams rather than individuals.

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