

Knowledge Activities and Learning in Project-based Industry: Relation to Organizational Culture

*Ajmal Mian, University of Vaasa, Vaasa, Finland, E-mail: mian.ajmal@uwasa.fi

Josu Takala, University of Vaasa, Vaasa, Finland, E-mail: jot@uwasa.fi

*Corresponding author

Abstract

This paper aims to scrutinize how the organizational culture impacts knowledge activities and learning in project-based industry. The extent to which organizational culture influences knowledge activities and ultimately the performance of the project-based organization is investigated in the study. Firstly, the concept of knowledge and organizational learning with organizational culture point of view is elaborated in light of current literature. Secondly, the nature of project-based business and the significance of knowledge required for it is highlighted. Thirdly, it is justified that how organizational culture has deep concern with knowledge activities and organizational learning. Finally, a framework of practical implications for project managers is presented.

1. Introduction

Due to uniqueness, uncertainty and complexity project-based companies are different from other companies. Then, technological changes and wider knowledge attached to them nowadays they are facing an environment characterized by growing levels of globalization and dynamism. Consequently, they necessitate paying greater attention to the evolution and continuation of internal skills and capabilities, which means changing both the knowledge foundation within a firm and the approach the firm uses its existing knowledge to compete. Therefore, launching a knowledge strategy might be considered the most excellent means to feed the organization's efforts to other end. Several companies, being aware of this reality, build up technological solutions which prop up knowledge acquisition and distribution at the same time as they focus their attention on quality control, inventory control and job design, among others. Still, an excessive focus on technical problems rather than on communal aspects results in breakdown among most of these companies (Cross and Israelit, 1999).

Project organizations face many challenges in knowledge management activities as projects are dispersed and peers collaborate from distance with each other. Also, project teams are temporary and a lot of learning may be lost when they disperse. In many studies researchers and practitioners refer to the internal culture as the hardest obstruction to overcome in the implementation of knowledge management and learning strategies in project organizations. A study by the Ernst & Young Center of Business Innovation in American and

European organizations conducted in 1997 identifies culture as the existing major barrier to knowledge transfer activities (Ruggles, 1998). In order to build up new knowledge and use the existing knowledge within the organization, it appears vital to generate an atmosphere of trust and security to take part in knowledge management.

However, numerous authors argue that a culture of confidence and relationship in the projects always provide a supportive atmosphere for knowledge management activities that leads to encourage innovation, experimentation and risk taking in the organization. (Ericksen, 1996; Ruggles, 1998; De Long and Fahey, 2000; Sveiby and Simons, 2002)

Therefore, this exploratory study aims to scrutinize how the organizational culture impacts knowledge activities and learning in project-based industry. The extent to which organizational culture influences knowledge activities and ultimately the performance of the project-based organization is investigated in the study. Firstly, the concept of knowledge and organizational learning with organizational culture point of view is elaborated in light of existing literature. Secondly, the nature of project-based business and the significance of knowledge required for it is highlighted. Thirdly, it is justified that how organizational culture has deep concern with knowledge activities and organizational learning. Finally, a framework of practical implications for project managers is presented.

2. Knowledge

Knowledge is one of the organizational assets that possessed by organizational affiliates, and includes practical knowledge, high-level technical competences, insight of systems and creative abilities (Quinn et al., 1996). Sarmiento (2005) described knowledge as "the combination of data and information, to which is added expert opinion, skills and experience, resulting in a valuable asset which can be used to aid decision making". Usually knowledge is sorted by making division between data, information and knowledge (i.e. figure 1). Data is seen as unprocessed raw facts. Information, in turn, is seen as processed data, an aggregation of data that have meaning. Knowledge, in turn, is considered to be individual's perception, skills, and experience.

Data ---- Information ---- Knowledge

Figure 1: Knowledge formation

Information has less significance and will not turn into knowledge until it is further developed by the human mind (Ash, 1998). This means that knowledge involves the processing, creation, or use of information in the mind of the individual (Kirchner, 1997). Although information is not knowledge, it is an important aspect of knowledge. The process begins with facts and data, which are organized and structured to produce general information. The next stage involves organizing and sorting this information to meet the requirements of a specific group of users – project teams in our case - producing contextual information. Then, individuals suck up the contextual information and renovate it into knowledge. This renovation process is affected by individuals' experiences, attitudes, and the context in which they work. The final stage of the range is behavior; unless information and knowledge lead to an informed decision or action, the whole process becomes useless (Infield, 1997).

A different way of sorting knowledge is to make a division between tacit and explicit knowledge. Nonaka and Takeuchi (1995) construct the same point in further with the help of precise terms: Explicit knowledge is documented and public; structured, fixed-content, externalized, and conscious. Explicit knowledge is what can be captured and shared through information technology. Tacit knowledge, in turn, resides in the human mind, behavior, and perception (Duffy, 2000). It evolves from people's interactions and requires skill and practice. Furthermore, Nonaka and Takeuchi (1995) claim that it is difficult to express tacit knowledge directly in words, and often the only ways of presenting it are through metaphors, drawings and different methods of expression not requiring the formal use of language. Tacit knowledge refers to feelings, intuitions and insights (Guth, 1996), it is personal, undocumented, context-sensitive, dynamically created and derived, internalized and experience-based (Duffy, 2000).

As thought by Nonaka and Takeuchi (1995), knowledge is the invention of the interaction of explicit and tacit knowledge. The process of creating knowledge results in an escalation of knowledge acquisition. It starts with people sharing their internal tacit knowledge by socializing with others or by capturing it in digital or analogue form. Other people then internalize the shared knowledge, and that process creates new knowledge. These people, with the newly created knowledge, then share it with others, and the process begins again.

Still, there is no division between tacit and explicit knowledge, but tacit and explicit knowledge are mutually constituted (Tsoukas, 1996). In other words, they should not be viewed as two separate types of knowledge. This means that, for any

explicit knowledge, there is some tacit knowledge. This implies that explicit knowledge is an extension of tacit knowledge to a new level (Mooradian, 2005). Hence, if there is value in identifying tacit knowledge, it is in relation to making explicit knowledge understandable. Tacit knowledge is an enabling condition of explicit knowledge and of the sharing of knowledge. This means that we argue that tacit knowledge is knowledge that is active in the mind, but not consciously accessed at the moment of knowing, and therefore it grounds, enables, causes, or somehow brings about the explicit knowing connected with individual people – project team members in our case.

Snider and Nissen (2003) characterize knowledge flow according to three perspectives. While the particulars about knowledge flows in each of these perspectives differ significantly, a key aspect of each is that such flow is a critical factor in an organization's success. The first perspective is "knowledge-as-solution" perspective that emphasizes the often real-time sharing of knowledge among practitioners seeking to solve problems or enhance operations. They further say that key managerial issues in this perspective include: selecting an appropriate technology and motivating organizational members to use the system.

The second perspective "knowledge as experience" perspective, describes that knowledge is obtained and accumulated for future use. That is, the principal flow of knowledge is across time, rather than across organizational or geographical space in the "solution" perspective. According to them, the emphases is on capturing practitioner experiences so that others may have access to and potentially learn from them, in the logic of learning from the mistakes of the past and avoiding reinventing the wheel.

The previous two perspectives reveal knowledge as a commodity that may be transferred to others. Beside this commodity view of knowledge they also describe it "knowledge as socially created" or as the creation of interpersonal relationships. Knowledge comes out from social interactions around a difficult position. This perspective thus emphasizes social processes that lead to knowledge creation and sharing. Managerial issues associated with this perspective are substantially different from those of the other two perspectives. Here the major issue is organizational design to enhance development of interpersonal relationships. Members must engage in informal, unstructured communications and processes of sense making, discussion, negotiation, and argument are central to the knowledge sharing process. It advocates the need of supporting organizational culture for informal interactions between individuals for knowledge to be created and shared.

3. KM and Organizational Learning

Davenport *et al.* (1998) defines knowledge management as a process of collection, distribution and efficient use of the knowledge resource. O'Dell and Grayson (1998) see knowledge management as a strategy to be developed in a firm to ensure that knowledge reaches the right people at the right time and that those people share and use the information to advance the organization's operations. According to Bhatt (2001), knowledge management is a practice of knowledge creation, validation, presentation, distribution and application. Further, Bounfour (2003) explains knowledge management as a set of procedures, infrastructures, technical and managerial tools, designed towards creating, sharing and leveraging information and knowledge within and around organizations.

While the above definitions differ in their explanation of knowledge management, but it appears to be a harmony of treating knowledge management as a process that smoothes the progress of knowledge exchange and sharing and establish learning as a constant course of action within the organization. So, knowledge management and learning go hand in hand (i.e. figure 2).

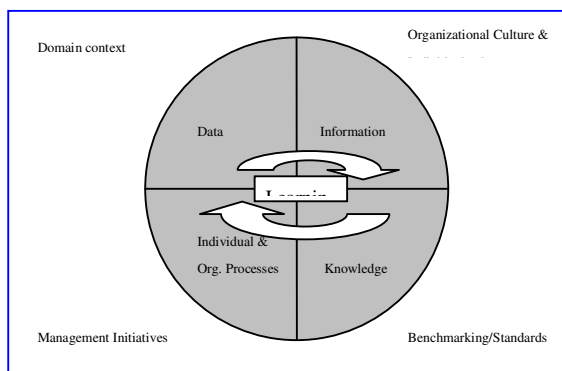


Figure 2: Knowledge management and learning (source: Love, 2005)

Data denote distinguished elements, and when processed in various ways, they are transformed into information. Once the information developed in actionable, it is transformed into knowledge. When knowledge is then learned and embedded into individual and organizational processes, the value of knowledge to the individual and organization increases in significance. The ecological factors affecting this knowledge cycle relate to domain context, organizational culture and individual value system, management initiatives and benchmarking or standards. Knowledge must have background if it is to be useful to an organization. Additionally, the encouragement of knowledge will be affected by the organizational culture, as well as the individual's value system. How knowledge is internalized and then

externalized is related to an individual's worldviews. Management initiatives and standards will also affect the creation of knowledge in the organization.

Learning processes describe the quality of knowledge circulated across the organization as well as the efficiency with which knowledge is put to use. In fact to pull knowledge, it is essential to work with the subjective nature of learning and the unconventional behavior of all those people who work within organizations, a task which requires greater consideration to individual and social processes of learning in organization (Cross and Israelit, 1999). In current business atmosphere, the majority of people agree that the organization's capability to learn faster than competitors is a significant source of competitive advantage (Stata, 1989; Senge, 1990).

According to Lopez *et al.* (2004) there are four constructs which are integrally associated to the learning process: acquisition of knowledge through external sources or of internal development; distribution, through which knowledge is spread among all the members of the organization; interpretation, which allows individuals to share and incorporate aspects of their knowledge, which are not common to all of them, gaining in such a way shared understanding and coordinating decision taking; and, finally, organizational memory, which tries to stock knowledge for future use, either in organizational systems designed for this purpose or by means of rules, procedures and systems.

They further describe that the organizational learning process is illustrated by a series of vital features. First, learning is a transformation process which is continuously created and recreated and not an independent entity to be acquired or transmitted (Kolb, 1984). Second, it is cumulative (Argyris and Schön, 1978). That is, the amount of knowledge at a certain point in time is a function of the cumulated knowledge acquired until that moment. Third, it is a process whose goal is to improve the development of the organization by means of new initiatives (technological, productive, or commercial). This requires a move from simply putting more knowledge into databases to leveraging the many ways that knowledge can migrate into an organization and impact business performance. Finally, it is a system-level process, that is to say, it embraces the whole of the organization and not only particular individuals.

However, these attributes make obvious that the learning process in a firm will be a very-wide ranging one, involving the obtaining of knowledge from the existing organization, the combining of knowledge, information, data or previous experience and the creation of new exercises for the resources (Nonaka and Takeuchi, 1995). The key to organizational learning lies in the exchange of mental models and their institutionalization in a firm's operational formation by transforming the rules of

decision that, until then, have dominated its behavior, thus enabling it to carry out more effective actions.

4. Projects and Knowledge

Managing through projects has become a standard mode of doing business and now can be distinguished to shape a vital part of many organization's business strategies (Björkegren, 1999; Prencipe and Tell, 2001). Factors that have influenced the emergence of project management as an approach for conducting business related activities include global competition, compression of the product life cycle, new product development, corporate downsizing, outsourcing, increased customer focus, and innovations in information technology. In reaction to such influences and prompted by the need to remain competitive businesses require to learn to manage more effectively the knowledge that they have acquire and accumulate from their projects (Davenport et al., 1998; Joyce and Stivers, 2000; Fernie et al., 2003). This will, however require a culture change, as there will be a need to encourage learning during expression. If knowledge is managed efficiently, it can be used to shrink project time, improve quality and customer satisfaction, and minimize delivery times. The management of knowledge, whether explicit or tacit, is a crucial precondition for project success in today's dynamic and vibrant global environment.

By knowledge gained to learn from failures or successes that have taken place in projects is critical for the long-term sustainability and competitiveness of business. Learning from projects experiences can stimulate area of practice within firms and possibly between firms where a strategic alliance exists, whose rationale is to create a cycle of application, assessment, reflection and renewal. A culture that is able to harness knowledge as a transferable asset and can be used to enhance future projects, and in certain cases expand the scope of an organization's project capability, can and should be formed but a bit complex and difficult to do.

The amount of new knowledge needed to generate a project depends on the novelty and uniqueness of the product being created. However, it is often argued that the processes involved in delivering the final outcome are similar, even though a project (the project team composition, product to be produced, etc.) is unique (Love *et al.*, 1999). Most projects, therefore, do not need to start from scratch inasmuch as they can utilize existing process and learn from the experiences acquired from previous projects. The effectiveness of this cycle will invariably be dependent upon the mechanisms for learning that are implemented throughout a project's life cycle. However, a well-designed organization structure, incentive schemes and management processes are crucial in assisting firms

to shape their knowledge assets into competences (Willem and Scarbrough, 2002).

Projects are always required to be completed within a specified period, which makes the reuse and harnessing of knowledge a necessity. Without the reuse of existing knowledge or the ability to create new knowledge from existing solutions and experiences, project-based firms have to create solutions to every problem, which is clearly inefficient. With the reuse of knowledge, project-based firms can learn to ameliorate project planning and operations so that deliverable can be achieved. The reuse of knowledge and learning can become more problematic when personnel leave a project before its completion, or the project is a temporary assemblage of experts who are geographically dispersed with diverse expertise or backgrounds, or where they use technology in different ways (Kasiv et al., 2003). Such project-based firms are disbanded once a project is completed and these experts are then absorbed back into their own firms and engage in other projects.

Projects do not have any organizational memory, as they are temporary in nature. In comparison with firms, which are supported by structure and routines to absorb knowledge, projects do not support any natural transfer mechanism. Deliberate management efforts and incentives are crucial to the creation, capture and transfer of knowledge. For instance, lessons learned have to be socialized consciously among individuals before they leave the project. Absence of KM will make projects unable to contribute to any improvement of the organizational business processes.

The management of knowledge in project-based firms is becoming a prerequisite to sustain a competitive advantage. Without a certain organizational culture during a project's life cycle, knowledge assets can lost once a project is completed. This results in organizational knowledge fragmentation and loss of organizational learning (Kotnour, 2000). The identification of critical knowledge and ability to utilize it is a challenge for every project organization (Kasiv et al., 2003) successful project management is based, on the one hand, on accumulated knowledge and, on the other hand, on individual and collective competences (Willem and Scarbrough, 2002).

5. Knowledge Activities for Learning and Organizational Culture

According to Schein (1997) organizational culture is a form of fundamental assumptions and beliefs that are shared by members of an organization, that function unconsciously, and that describe an organization's outlook of itself and its surroundings. These assumptions and beliefs are learned responses to a group's problems of survival in its external environment and its problems of internal integration. Thus, Schein explains that culture affects, to a great

extent, both organizational effectiveness and individual fulfillment.

Barney (1986) argued the potential for organizational culture to serve as a source of sustained competitive advantage. He further describes that until firms do not have the required supportive cultures they cannot engage in knowledge activities that will generate sustained superior performance. Organizations which have a culture that supports and encourages knowledge activities should attempt to understand what it is about their culture that gives them a competitive advantage and develop and cultivate those cultural attributes (Barney, 1986). Currently, there is growing consensus on the proposal that organizations making the attempt to commence a culture which encourages communication among their members, experimentation and risk taking, and motivates employees to question fundamental beliefs and work patterns, will attain a favorable working atmosphere for the expansion of their ability to learn.

De Long and Fahey (2000) categorize four habits in which culture manipulates the behaviors integral to knowledge creation, sharing and use. First, culture shapes assumptions about what knowledge is and which knowledge is worth managing. Second, culture defines the relationships between individual and organizational knowledge, determining who is expected to control specific knowledge, as well as who must share it and who can get on it. Third, culture creates the background for social interaction that determines how knowledge will be used in particular situations. Fourth, culture shapes the processes by which new knowledge is created, legitimated and distributed in networks.

Davenport and Prusak, (1998) express that cultures that openly support knowledge sharing and knowledge incorporation into the organization promote argumentation and discussion in facilitating contributions from individuals at multiple levels of the organization. Such contribution is enabled by practices that engage individuals gathering data from various sources, exercising their opinion to convert data into information and then engaging in extreme communication and conversation to create new knowledge that can be the origin for action.

However, Gupta *et al.* (2000) acknowledged that organizational learning demands a high degree of commitment at all levels of the organization, which necessitates a culture that bases its potential on the aspiration to improve and learn, shared by all the members of the organization. On the one hand, the manager must be willing to lose some of their authority and, the individual must be able to take the risks and responsibilities that they are asked to

share the failure or success of the project and of the enterprise (Senge *et al.*, 1999).

According to De Long and Fahey (2000), Elkjaer (1998), Gupta *et al.* (2000), Liedtka (1999), Ruggles (1998), Senge *et al.* (1999), and Sveiby and Simons (2002) the following principles have been considered as the essential for an organizational culture that encourages knowledge activities and organizational learning:

1. long-standing future visualization;
2. move ahead for the management of transformation;
3. channels of communication and points for discussion ;
4. self-respect and trust for all individuals;
5. collaboration of individuals;
6. authorizations to individuals;
7. environment of broadmindedness;
8. supposition of threat; and
9. promoting multi-ethnic atmosphere.

Organizational culture may possibly find out individual behavior, but it is also parallel constituted through human behavior (Swieringa and Wierdsma, 1992). Culture awareness increases the likelihood of learning becoming a natural process in the organization. This requires developing the hidden, basic assumptions and beliefs embedded in the organization (Schein, 1997) and developing the capability to engage in double-loop learning (i.e. generative learning), using the inquiry processes Argyris and Schön (1978) suggest. This means that a project design to be effective for learning necessitates a context where team members can question institutional norms (Ayas and Zeniuk, 2001). Organizational culture based on commitment to truth and inquiry starts at the individual level as they reflect their actions and how they contribute to their problems, feel the necessity to change and see their own part in the change process (Senge, 1990). Therefore, there should be a working environment favorable for the progress of the individuals. Firms should be seen as entities which unite all individuals beyond those competitive rivalries to which each of them is submitted to in many aspects of daily life. The aim is to build up institutions which may be able to anticipate changes, to be flexible and change as they may be required to, encouraging communication among all members of the company, decreasing managerial hierarchical barriers, committing themselves to innovative initiatives and assuming the new values in all sections (Senge, 1990).

Indeed, organizational culture has major constraining or facilitating effects on the knowledge creation within organizations. Because organizational culture is such a difficult concept to capture and describe, it is important to identify the basic elements of predominant cultures within organizations. According to West (1997), the two primary dimensions of organizational culture are flexibility versus control, and internal versus external orientation. High flexibility is characterized by flatter organizational structures, decentralized decision-making and low specialization of jobs, while high control cultures tend to be very hierarchical in their structures, with centralized decision-making and many specialized jobs with a proliferation of job titles.

Internal forces like organization's structure and management style affect the culture. Rigid, formal and command and control structures, for example, can encourage functional efficiency at the expense of collaborative and innovative activities. Furthermore, sub-cultures typically exist within the overall structure of the organization, and they grow out in different locations, occupations, and the provision of services. Sub-cultures may be very different from the base organization's culture, even within the same organization.

External forces also shape organizational culture and are very powerful since organizations reflect national, trans-national, regional, industry and occupational ideologies. These may take the form of religion, political ideologies, and environmental concerns. The substance of an organization's culture may reflect many beliefs, only some of which invent inside the organization.

6. Implications for Project Managers

Familiarity with the culture of an organization is critical to running successful projects. Culture resides in every fold of an enterprise, influencing the dynamics of how people perform, relate and perceive the firm's impact on their lives. However, individuals, project teams, and organizations infrequently fit one particular type organizational culture because they represent complex social systems and mixtures of many cultural patterns. Nevertheless, there are models that identify some systematic processes that the people working for projects can use to make sense of their environment.

Although the organization transmits its values and beliefs to its members, the project manager also creates a team culture by transmitting values and beliefs to the team members. This process is aimed at developing project goals and objectives, group norms i.e. how decisions are made, conflicts resolved, trust built, etc.

Differences in the assumptions and beliefs of each core culture and "how we do things around here to

succeed," have profound implications for the success of projects. Appreciating the values and beliefs of the base organization can help the project manager to understand how to adapt his or her behavior and develop more effective approaches to make a project successful.

Project managers often engage in transactions with several different cultures simultaneously. They typically work within their own base organization core culture; with the sub-cultures of other departments within the organization (research and development, marketing and sales or manufacturing); or with an external customer's core culture. Each has their own inherent "ways of doing things around here to succeed" (Suda, 2006, p. 52). Understanding and speaking the language of the immediate culture is critical for project success. Effectively communicating with the surrounding culture can help develop plans and strategies that will be recognized and time-honored by the organization – while avoiding practices that violate the beliefs and values of the client organization.

Project managers must also be able to interact with various sub-cultures within their organizations and that of customers. Managers who are aware of cultural differences can avoid or minimize unproductive conflicts and misunderstandings. Differences may arise from various reasons like values, assumptions, and beliefs, and arise from problems communicating across cultures. The nature of communication in research and development projects is very different from the communication used in standardized delivery projects. It is important for the manager to make a concerted effort to speak and listen in ways that take these differences into account. Attributing project barriers to another co-worker's inflexibility or stubbornness may polarize differences, escalate conflict and make it very difficult or next to impossible to complete the project.

7. Discussion and Conclusion

In particular, to promote knowledge activities and learning, the focal point of the top management must be the fundamental assumptions embedded in the organizational culture at hand and not exclusively on direct knowledge activities and learning between project team members or managers. This means that managers who wish to facilitate knowledge transfer between project managers must focus on the very concept of project organizing, the reward system, top management interaction, etc., as these elements constitute the framework in which knowledge transfer is supposed to take place.

Once top management recognizes basic assumptions related to knowledge activities and learning, then it can take initiatives for knowledge and learning practices that do not conflict with such assumptions. If this does not support enough knowledge activities, then further is to look for change in assumptions. On

the other hand, as understood by Schein (1997) it is hard to change basic assumptions. One reason is that they, rather, exist outside the conscious part of individuals' minds. Additionally, they are developed with the passage of time because they have proved to guide success. Thus, it is not easy to give them up. A third reason, which is related to the previous reasons, is that giving up basic assumptions build concerns for the people involved. Moreover, the basic assumptions under consideration may reflect assumptions shared by the whole community as the project management discipline is very much institutionalized and there might be a common, strong belief about correct and incorrect.

However, a successful change of a basic assumption might be possible if the new assumption stimulates behavior that creates tremendously positive results. If, for instance, the project managers realized that they could learn a great deal from analyzing their past experiences, they might try to change their perception about the value of a concern about the past.

8. References

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