

Knowledge Transfer in Project-Based Organizations: An Organizational Culture Perspective

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ABSTRACT ■

This conceptual paper investigates the process of knowledge transfer in project-based organizations from the perspective of organizational culture. The paper identifies obstacles to knowledge transfer in project-based organizations and emphasizes the importance of organizational and project cultures in this process. The study provides some suggestions for improving knowledge transfer in project-based organizations and notes the implications of the paper for project management.

KEYWORDS: knowledge transfer; project-based organizations; organizational culture

INTRODUCTION ■

Because the projects undertaken by project-based organizations (PBOs) are characterized by uniqueness, uncertainty, and complexity, PBOs are different from other business organizations in many respects. These differences extend to their requirements with respect to knowledge transfer.

Although the benefits of knowledge transfer have long been recognized in project-based organizations, the effectiveness of such knowledge transfer varies considerably among these organizations. The ability to manage what they know is often constrained by their capabilities with respect to creating, valuing, absorbing, and sharing knowledge. For this reason, an effective understanding of knowledge management—how PBOs utilize and integrate their dispersed knowledge—becomes essential.

Such knowledge management in project-based organizations is often a complex task. This is because project teams often consist of people with diverse skills working together for a limited period of time; indeed, a project team often includes members who have never worked together previously and do not expect to work together again (Burns & Stalker, 1961). In these circumstances, effective knowledge management is complex, but essential. Moreover, many “non-project businesses” are now adopting a “project-style” approach to their conduct of a variety of operational activities, and the influence of such “project-based” actions on the whole organizational performance is of increasing importance in a range of industry sectors. However, as Love (2005) has noted, knowledge management within projects is often sub-optimal within these organizations because knowledge is created in one project, and then subsequently misplaced.

Organizational culture is the basic, taken-for-granted assumptions and deep patterns of meaning shared by organizational participation and manifestation of these assumptions (Slocum, 1995). The failure of many knowledge transfer systems is often as a result of cultural factors rather than technological oversights. However, culture, by its very nature, is a nebulous subject with a variety of perspectives and interpretations.

Against this background, the objective of the present conceptual study is to investigate knowledge creation and transfer in project-based organizations from the perspective of organizational culture. The research question addressed by the study is: How does organizational culture affect the process of knowledge transfer in project-based organizations?

Knowledge

The concept of “knowledge” can be distinguished from “data” (unprocessed raw facts) and “information” (meaningful aggregations of data). Knowledge

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involves a person using his or her perception, skills, and experience to process information—thus converting it into knowledge in the mind of the individual (Kirchner, 1997). Information thus has little worth in itself until it becomes knowledge as a result of processing by the human mind (Ash, 1998).

The process begins with *data* being organized to produce *general information*. The next stage involves this general information being sorted and structured to produce *contextual information* that meets the requirements of a specific group of users (such as project teams). Individuals then absorb the contextual information and transform it into *knowledge* on the basis of the individuals' experiences, attitudes, and the context in which they work. The final stage of the process is *behavior*; as Infield (1997) has observed, unless knowledge leads to an informed decision or action, the whole process is useless.

Knowledge can be categorized into: (i) tacit knowledge and (ii) explicit knowledge (Nonaka & Takeuchi, 1995). *Explicit knowledge* is documented, public, structured, externalized, and conscious; it has a fixed content that can be captured and shared through information technology. In contrast, *tacit knowledge* resides in the perceptions and behavior of human beings (Duffy, 2000); it evolves from people's interactions and requires skill and practice. According to Nonaka and Takeuchi (1995), it is often difficult to express tacit knowledge directly in words; in these cases, the only means of presenting tacit knowledge is through metaphors, drawings, and various forms of expression that do not involve the formal use of language. Tacit knowledge thus refers to feelings, intuitions, and insights (Guth, 1996); it is personal, undocumented, context-sensitive, dynamically created and derived, internalized, and experience-based (Duffy, 2000).

According to Nonaka and Takeuchi (1995), new knowledge is created by an interaction between explicit knowledge

and tacit knowledge, facilitated through socialization and knowledge sharing. However, this does not imply a dichotomy between tacit knowledge and explicit knowledge; rather, the two forms of knowledge are mutually constituted (Tsoukas, 1996). According to Mooradian (2005), explicit knowledge is an extension of tacit knowledge to a new level. Tacit knowledge can thus be understood as knowledge that is active in the mind, but not consciously accessed at the moment of knowing. It grounds, enables, and produces the explicit knowing of individual people—such as the members of a project team.

Knowledge Flows

According to Snider and Nissen (2003), knowledge flow is a critical factor in an organization's success. These authors categorized such knowledge flow from three perspectives: (i) "knowledge as solution," (ii) "knowledge as experience," and (iii) "knowledge as socially created."

The first perspective, "knowledge as solution," emphasizes the real-time transfer of knowledge among practitioners who are seeking to solve problems or enhance operations. The key managerial issues in this perspective include the selection of an appropriate technology and the motivation of organizational members to use the system.

The second perspective, "knowledge as experience," describes knowledge as being obtained and accumulated for future use. According to this perspective, the principal flow of knowledge is across time, rather than across organizational or geographical space (as is the case in the "knowledge-as-solution" perspective). The emphasis is on capturing practitioner experiences so that others can have access to (and potentially learn from) these experiences. The rationale of this perspective is learning from mistakes and avoiding attempts to "reinvent the wheel."

Whereas the previous two perspectives see knowledge as a commodity

that can be transferred to others, the third perspective, "knowledge as socially created," emphasizes knowledge as being created and shared through interpersonal social relationships. Managerial issues associated with this perspective are concerned with organizational design to enhance the development of interpersonal relationships. Members must engage in informal and unstructured communications to facilitate sense making, discussion, negotiation, and argument—which are central to the knowledge-transfer process. This perspective advocates a supporting organizational culture that encourages informal interactions between individuals to ensure that knowledge is created and transferred.

Project-Based Organizations and Project Management

Project-based companies are organizations in which the majority of products are made against bespoke designs for customers. These types of organizations can be: (i) stand-alone companies that make products for external customers, (ii) subsidiaries of larger firms that produce for internal or external customers, or (iii) consortiums of organizations that collaborate to serve third parties (Sandhu & Gunasekaran, 2004; Turner & Keegan, 1999).

The growing trend in project management is not a breakthrough of new ideas; rather, it is a revitalization of the discipline in a current business context. Project management is increasingly concerned with taking systems and processes that originated in the conventional paradigm of project management and applying them to general organizational theory. Whereas project management was previously regarded as a specialized management process with specific planning, monitoring, and control techniques that were applied to the operations of a few project-oriented industries (such as construction, engineering, and defense), it has now come to be regarded as an inclusive concept that can be integrated into a general

organizational effort to provide better quality to customers through effective intra-organizational integration and the optimal utilization of scarce resources. As a result, project management is now positioned as a complex managerial process among other organizational processes (such as knowledge management) that ensures an optimal balance between the internal organizational design of a firm and its emerging strategies.

Project Management and Knowledge Transfer

Knowledge management is of crucial importance to efficient project management. The growing complexity of project work means that an increasing number of technical and social relationships/interfaces must be taken into account by project managers in adapting knowledge and experiences from the daily work of a company and from earlier projects. Project team members frequently need to learn things that are already known in other contexts; in effect, they need to acquire and assimilate knowledge that resides in organizational memory. Their effectiveness in doing this determines their personal effectiveness, the project's effectiveness, and, ultimately, the company's effectiveness (Huber, 1991).

Within functional organizations, there are established departments and branches in which knowledge and experiences are acquired and stored. Project teams know that they can access this knowledge and experience from the documented records of a specific department, or from observing the competent employees and their working processes.

The situation is somewhat different in specifically project-based organizations because the team members of particular projects are the main transporters of knowledge and experiences of daily work. In the ideal case, the arrangements for transfer of knowledge and experiences from specific projects to the main organization are clearly

established by project management. In these circumstances, project-based organizations systematically identify and transfer valuable knowledge from current projects to subsequent projects. However, this ideal scenario is often not the case. In other words, project information is infrequently captured, retained, or indexed so that people external to the project can regain and apply it to future tasks (see also Weiser & Morrison, 1998).

A failure to practice effective knowledge management means that many project-based organizations are unable to appraise projects and learn from them. At its simplest, a failure to review a finished project means that the past errors are likely to be repeated. In some cases, project-based organizations can fail to learn from their mistakes for years on end. A broad range of reasons for this failure in knowledge management has been suggested—including organizational, technical, methodological, and cultural issues (Boddie, 1987).

It is not as though the concept of archiving and using learning histories is unknown in project-based companies. Indeed, in many companies it is considered good practice to create documented accounts of what has been learned in a project. However, according to Conklin (2001), even in companies in which this practice is normal routine, it is difficult to find instances of the resulting document actually being referenced in the next project. Alternatively, some project teams have attempted to capture their learning by videotaping their meetings; however, these teams often accumulate a staggering volume of recorded materials on tape (Conklin, 2001). The important pieces of data they require for subsequent projects are in there somewhere, but no one has the time to peruse all the recorded material and locate the relevant data.

It is thus apparent that project-based companies cannot create a useful memory store merely by capturing lots of data; rather, they must organize

these data in a manner that creates a coherent whole. This cannot be achieved as a "by-product"; that is, it cannot be relegated to the status of an extra task that is peripheral to the organization's main production process (Conklin, 2001). However, many of the people who work in project-based companies are bombarded by urgent problems and pressing deadlines and do not have the time to commit themselves to an explicit knowledge-management undertaking (Jashapara, 2004). It is thus apparent that project-based companies must find ways of preserving and utilizing their knowledge within the established practices of everyday teamwork.

In undertaking this task, project-based organizations require a clear understanding of the sorts of knowledge that should be included in an effective knowledge-management system. In this regard, Conroy and Soltan (1998) have identified three "knowledge bases" in project implementation:

- an *organization* knowledge base, which includes the knowledge specific to organizations and environments in which the projects are implemented;
- a *project-management* knowledge base, which includes the knowledge of the theory and application of project management; and
- a *project-specific* knowledge base, which includes specific knowledge acquired within the implementation of a particular project.

Although the knowledge produced within the implementation of a given project is categorized in this schema as "project-specific knowledge," Conroy and Soltan (1998) noted that the organization base and the project-management base are also developed during the implementation of any project. Conroy and Soltan (1998) divided such project-created knowledge into three general categories:

- *technical knowledge*, which relates to the techniques, technologies, work processes, costs, etc., that are involved

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in discipline-specific issues of the project;

- *project management knowledge*, which relates to the methods and procedures required for managing the implementation of projects; and
- *project-related knowledge*, which refers to knowledge about the customer and other people or entities that are of significance for the future business of the company.

Because this project-created knowledge is initially held only by project team members, it is necessary to identify, capture, and make this knowledge available to the organizational memory of the company.

Obstacles to Knowledge Transfer in Project-Based Organizations

Most project tasks are conducted under strict constraints of time and budget. In addition, team members from a completed project are usually needed for the next project, and their new team leaders therefore recruit them into new teams as soon as possible. Given these constraints, it is rarely possible for all team members to undertake a systematic review of a completed project and document the knowledge and experiences derived from it.

Furthermore, there are significant individual and social barriers that prevent the articulation and documentation of knowledge and experiences (Disterer, 2001, 2002). In particular, barriers exist with regard to the honest and open analysis of failures and mistakes; the open and productive atmosphere that would facilitate the articulation and analysis of errors is rarely present in most project-based organizations. This is unfortunate because successful projects demonstrate only that the methods that were employed were adequate for that specific task, whereas failed projects are likely to yield more valuable knowledge. Unfortunately, more effort is required to expose what mistakes can teach (Boddie, 1987).

Motivation to undertake a proper review is also a problem. It is apparent that the organization as a whole can benefit if individual employees can make use of the knowledge and experiences of their colleagues in previous projects. However, these synergies among employees can only be fully established and developed if *all* employees are willing to take part in the knowledge exchange. Unfortunately, these potential benefits to the organization are not readily apparent to individual employees, who are inclined to ask: "What benefit is there in it for me?" In short, there is insufficient individual motivation to document the lessons learned.

There is also often a lack of leadership in according sufficient importance and status to proper knowledge management. Although most methodologies recommend particular work packages for securing knowledge and experiences, the fact is that these processes are often not included in the overall project plan (Liikamaa, 2006). It is not surprising that team members do not perceive effective knowledge management as being significant if the project plan does not explicitly assign sufficient time and resources to this aspect of the project.

In many ways, these problems reflect inadequacies in *organizational culture*. Knowledge transfer involves communication among people, and although technology can handle the communication of already explicit knowledge, the communication of intrinsic knowledge (and the creation of new knowledge by the transformation of information into knowledge) requires social interaction and human cognition. Any analysis of knowledge transfer thus requires the culture of the organization to be taken into consideration.

In summary, the above discussion has shown that knowledge cannot simply be stored (Gopal & Gagnon, 1995). Knowledge resides in people's minds, rather than in computers ("CSFI Knowledge Bank," 1997). Unlike raw

material, knowledge is not coded, audited, inventoried, and loaded in a warehouse for employees to use as needed. It is scattered, messy, and easy to lose (Galagan, 1997). In this regard, Allee (1997) identified 12 characteristics of knowledge in noting that:

. . . knowledge is messy; it is self-organizing; it seeks groups of people; it travels on language; it is slippery; it likes carelessness; it is in shape of experiments; it does not grow forever; it is a social phenomenon; it evolves organically; it is multi-modal; and it [requires] the flow of data/information.

It is therefore necessary to develop effective multidimensional means of facilitating the input of (and access to) information (Mayo, 1998). It is also necessary to develop effective ways of sorting the useful from the useless (Schaefer, 1998). To achieve these things, it is necessary for project-based organizations to develop an organizational culture that coordinates and facilitates knowledge transfer.

Organizational Culture and Knowledge Transfer

An organization's culture consists of the practices, symbols, values, and assumptions that the members of the organization share with regard to appropriate behavior (Schein, 2000; Wilson, 2000). Such a culture is holistic, historically determined, and socially constructed; moreover, it exists at various levels in the organization and is manifested in virtually all aspects of organizational life (Hofstede, Neuijen, Ohayv, & Sanders, 1990). According to Denison (1990), an organization's culture serves as a foundation for its management system and practices. Because the organization's culture provides norms regarding the "right" and "wrong" ways of operation, organizational culture stabilizes the firm's methods of operation.

Organizational culture thus ultimately determines how decisions are

made, and how staff members respond to the environment (Ott, 1989). In the words of Schein (2000, p. xxiv), organizational culture represents: "... the deeper level of basic assumptions and beliefs that are shared by members of the organization, which operate unconsciously in the environment." It has been described as a "social force" that motivates people to act in a particular manner (Gundykunst & Ting-Toomey, 1988). In the opinion of Kilmann, Saxton, and Serpa (1985), culture is to the organization what personality is to the individual—themes that provide meaning, direction, and mobilization.

An awareness of the organization's culture increases the likelihood of learning becoming a natural process in the organization. This is because a proper awareness of the organization's culture involves the identification and recognition of the tacit assumptions and beliefs that are embedded in the organization (Schein, 2000). Recognizing and questioning these basic assumptions enhances the capability of the members of the organization to engage in so-called "double-loop learning" (Argyris & Schön, 1978). An organizational culture that is based on a commitment to truth and inquiry empowers individuals to: (i) reflect on their actions, (ii) consider how these actions can contribute to problems, (iii) recognize the necessity for change, and (iv) perceive their own roles in the change process (Senge, 1990). In terms of project management, such "double-loop learning" (or "generative learning") is likely to occur only if the project design encourages team members to question institutional norms (Ayas & Zeniuk, 2001).

Organizational culture thus has the potential to constrain or facilitate knowledge creation and transfer within an organization. According to West (1997), the two fundamental dimensions of organizational culture are: (i) flexibility versus control and (ii) internal orientation versus external orientation. Greater flexibility is characterized

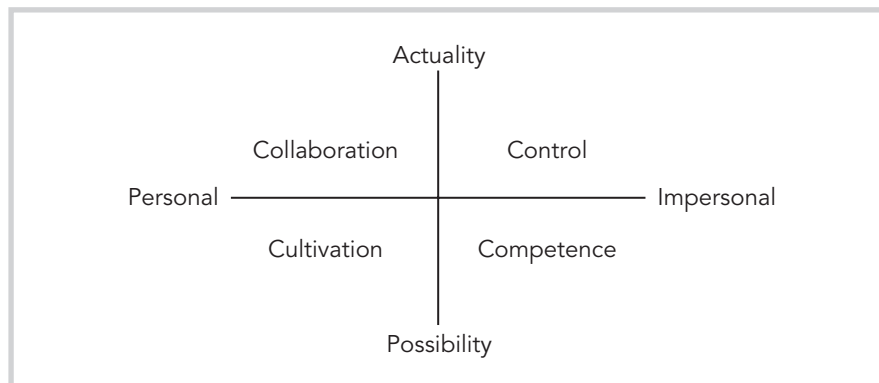


Figure 1: Four core cultures.

by "flatter" organizational structures, decentralized decision making, and minimal specialization of jobs, whereas greater control is characterized by hierarchical structures, centralized decision making, and a large number of specialized jobs with a proliferation of job titles. Rigid and formal structures can promote mere functional efficiency, but this is often at the expense of collaborative and innovative activities.

External forces also shape organizational culture because organizations necessarily reflect the national, regional, industrial, and occupational cultures within which they function. In some cases, these can take the form of religious dogma and political ideology. An organization's culture can thus reflect many beliefs that do not originate from within the organization.

In the management literature, there are many different typologies of organizational culture. For example, according to Schneider (1994), it is possible to identify four distinct "core cultures" on the basis of: (i) what each culture focuses on ("content") and (ii) how each culture makes decisions ("process"). As illustrated in Figure 1, this can be depicted in terms of two axes: (i) a vertical axis indicating content ("actuality" or "possibility") and (ii) a horizontal axis indicating process ("personal" or "impersonal").

According to Schneider (1994, p. 77):

... the qualities and characteristics associated with the content and

process axes are organizational and cultural preferences or central tendencies ... [and as such] are not exclusionary—having a preference for one does not preclude involvement in the other.

In other words, placing an organization in a particular quadrant does not mean that the culture of the organization is exclusively of a particular type. For example, an "actuality" organization does not deal exclusively in facts, nor does a "possibility" organization ignore facts; rather, one style *predominates* in how the firm works.

The four "core cultures" illustrated in Figure 1 can be characterized as follows:

- **Control core culture** is concerned with ensuring certainty, predictability, safety, accuracy, and dependability.
- **Competence core culture** is concerned with achievement, gaining distinction by being the best and/or having the highest quality; this is a culture of unique products and/or services
- **Collaboration core culture** is concerned with affiliation and synergy in a culture of unity and close connections; this culture is concerned with tangible reality, actual experience, practicality, and utility; however, its decision making is people-driven, organic, and informal.
- **Cultivation core culture** is concerned with meaningfulness, self-actualization, and enrichment; this culture is concerned with potential, ideals, beliefs, aspirations, inspiration, and

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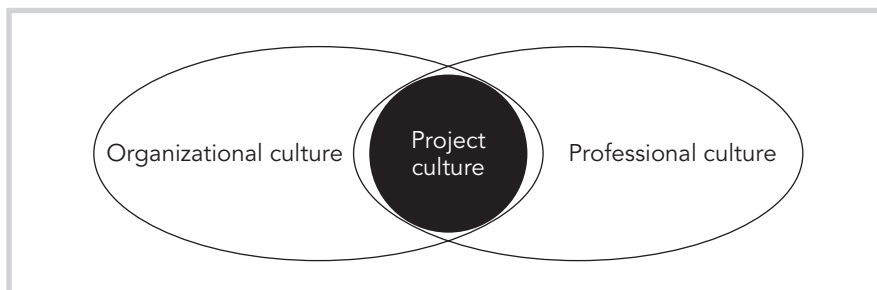


Figure 2: Project culture [Ruuska, 1999].

creative options; its decision making is people-driven, open-minded, and subjective.

Understanding the culture of an organization is critical to running successful projects. However, individuals, project teams, and organizations can seldom be categorized into one particular type of organizational culture because they typically represent mixtures of several cultural patterns. Nevertheless, shared values and a unified vision are vital for projects because they provide the focus and energy for knowledge creation. Although adaptive knowledge creation is possible without vision, generative knowledge creation occurs only when people are striving to accomplish something that matters deeply to them. The whole notion of generative knowledge creation can appear to be abstract and meaningless unless people become enthused about a shared vision to which they are committed.

The situation is complicated in project management because a project involves several experts working in various fields. Different professions typically have their own cultures and ways of working, which are not necessarily in harmony with one another or with the prevailing culture of the whole project (Ruuska, 1999). According to Wang (2001), a professional culture shapes a professional community by ensuring that the members of the profession think and behave as the profession requires. Because a profession is not limited to a particular organization (or even a particular industry or nation), its

professional culture exists across boundaries.

To achieve harmony in these circumstances, a project requires a strong directional culture, as illustrated in Figure 2.

This requires a synthesis of cultures, rather than an attempt to unify the various professional cultures; it thus requires appropriate modes of cooperation and communication for the project at hand.

Promoting Knowledge Transfer in Project-Based Organizations

An organization consists of several levels in which knowledge can be initiated (Crossan, Lane, & White, 1999; Nonaka & Takeuchi, 1995). For convenience, these levels can be differentiated as the individual level, the group level, and the organizational level.

- *Individual:* According to Simon (1991), knowledge originates with individuals and is then transferred to other levels of the organization.
- *Group:* Knowledge transfer at the group level can be understood as a social process (Simon, 1991), which provides an opportunity for an exchange of ideas (Hall, 2001).
- *Organizational:* Knowledge can then be transferred and institutionalized in the wider organization (Crossan et al., 1999). This knowledge alters the beliefs and assumptions of the organization, and ultimately transforms the organization's prevailing procedures and systems.

According to Schein (2000), any difficulties in knowledge transfer between

these levels are primarily related to the "psychological climate" of the organization, which, in turn, depends upon the culture of the organization. According to this view, the biggest challenge for knowledge transfer is not technical (which can be overcome with IT systems), but cultural ("Knowledge Management," 1997; Koudsi, 2000). In particular, there is often a prevailing attitude that *holding* information is more important than *sharing* it (Anthes, 1998). In one study ("The People Factor," 1998), culture was perceived by 80% of those surveyed as the biggest obstacle to effective knowledge transfer.

Many project-based organizations are attempting to facilitate knowledge management by utilizing databases of customers, products, and services to share and distribute information. However, organizations that attempt knowledge management without an effective managerial support structure often discover that their investment in knowledge management fails to deliver the expected benefits (Goh, 2002; Nahm, Vonderembse, & Koufteros, 2004). The project manager has a crucial role in creating a team culture that facilitates the development of project goals and group norms with respect to decision making, conflict resolution, and so on. In doing so, project managers often have to deal with several different cultures simultaneously. They typically work within the core culture of their own organization, and also have to work with the subcultures of various departments within the organization (such as research and development, marketing and sales, and manufacturing) and with the core cultures of external organizations. Each of these has its own ways of doing things (Suda, 2006). Effective communication with these various subcultures and external cultures is necessary to develop plans and strategies that will be accepted by all, while avoiding practices that violate the beliefs and values of any.

Managers who are aware of cultural differences can avoid or minimize

unproductive conflicts and misunderstandings. For example, the nature of communication in research-and-development projects is different from that in standardized delivery projects, and it is therefore important for managers to take these differences into account. If managers are not aware of such cultural differences, they might attribute difficulties to a coworker's inflexibility or stubbornness, which is likely to polarize differences, escalate conflicts, and increase the difficulties of completing the project.

According to Abell and Oxbrow (1997), three areas require particular attention by management in seeking to establish an effective organizational knowledge culture: (i) preparing the organization, (ii) managing knowledge resources, and (iii) organizing knowledge for competitive advantage. However, transformation of an organizational culture is difficult to accomplish (Roth, 2004). Smaller organizations and recently established organizations are easier to change than larger, older organizations that have a well-established corporate culture and an inflexible managerial style (Becerra-Fernandez, Gonzalez, & Sabherwal, 2004).

Certain questions must be addressed in gathering and preserving knowledge at different stages of a project (Disterer, 2002):

- How is communication conducted among various members of the project team?
- What elements have improved the progress of the project, and which have slowed it down?
- What types of knowledge from the project can be forwarded to others?
- What is the progress of the project tasks during different stages?
- Which issues are critical for successful acquisition of project knowledge?
- What can be performed well and what can be improved in the next project?
- What are the particular complications during a project that can inhibit knowledge collection and preservation, and how can these be managed?

From the above discussion, it is apparent that knowledge management in project-based business has a higher probability of succeeding if managers:

- begin with the premise that organizations are living social systems;
- assess and identify the organization's core culture, and align the project with it; and
- recognize that all organizations have a core culture and that the project culture must function in accordance with the organization's core culture.

Conclusions

The conclusions of this paper can be summarized as follows:

First, for effective knowledge transfer in project-based business, it is crucially important to prepare the organizational culture to accept, adopt, and utilize new knowledge-transfer activities.

Second, knowledge management is not just about transferring knowledge; rather, it is about fostering an organizational culture that facilitates and encourages the creation, sharing, and utilization of knowledge.

Third, project managers must merge several different organizational and professional cultures into one project culture that promotes effective knowledge management.

The identification of viable means of ensuring that knowledge is produced and diffused across project boundaries and throughout the organizational hierarchy is a very important issue for project-based businesses. This requires a thorough understanding of the complexities of the organizational and professional cultures that guide and motivate the people working in projects. ■

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