

The Role of Tacit Knowledge Management in ERP Systems Implementation

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Many organizations that implemented ERP systems have reported negative impacts from these large investments. According to extensive academic debates the reason ERP systems implementation are not successful is the disconnection between them and organizational performance due to the economic transition from an era of competitive advantage based on information to one that is based on knowledge. Managing knowledge in an ERP implementation project is a complex and difficult task, as a typical ERP system entails many users, both internal and external, ranging from top executives to data entry operators, external consultants and software vendors. This paper focuses on assessing the role of tacit knowledge management on the success of Enterprise Resource Planning (ERP) systems implementation.

Keywords: tacit knowledge, knowledge management, ERP systems.

Introduction

ERP systems focus on the integration of business functions throughout the entire enterprise by facilitating the flow of information across the line of the business processes as they cross the departmental boundaries. ERP systems run off a single database and enable various departments to share information and communicate with each other. Enterprise system as a technology is designed to enable firms to better manage their knowledge by integration of business processes and have better control of information and data in the organization [11]. The knowledge required during enterprise system implementation includes a variety of expertise, experiences and skills and therefore cross-functional and cross divisional transfer of knowledge is necessary to ensure that the requisite enterprise system knowledge is available for a successful implementation [10]. ERP knowledge can not be transferred directly to the organization's user. This knowledge is dispersed within the organization and outside the organization. During a successful ERP implementation project this knowledge must be combined and integrated and transformed into applicable knowledge in the particular context of the project [5]. ERP knowledge academic literature is divided in two main research domains: the first one refers to the ERP system as a knowledge

management tool [4] and the second regards understanding the role that knowledge and knowledge management have on the ERP system implementation success. This paper is focused on the implications of tacit ERP-specific knowledge on the overall success of the ERP implementation project.

ERP knowledge definition and classification

Knowledge represents a mix of framed experience, values, contextual information and expert insights that provides a framework for evaluating and incorporating new experiences and information. In organizations, knowledge often becomes embedded, not only in documents and repositories, but also in organizational routines, processes, practices and norms [1].

Knowledge can be classified into general knowledge and specific knowledge. General knowledge is broad, often publicly available, commonly shared knowledge. In contrast, specific knowledge is context specific in an organization. There are three specific knowledge types that are required in an ERP project. They are: software specific knowledge, business process specific knowledge and organization specific knowledge [9].

Knowledge can be further classified as tacit or explicit. Explicit knowledge can be expressed in words and numbers and shared in

the form of data, scientific formulae, manuals and the like. Explicit knowledge is precisely and formally articulated, although removed from the organizational context of creation or use and can be readily transmitted between individuals [6,8]. Explicit knowledge plays an increasingly larger role in organizations and many consider it the most important factor of production in a knowledge economy [8].

Tacit knowledge is subconsciously understood and applied, difficult to express, emerged from direct experience and action, and usually shared through highly interactive conversation and shared experiences.

There are two dimensions to tacit knowledge. The first is the technical dimension, which encompasses the kind of informal personal skills or crafts often referred to as „know-how“. The second is the cognitive dimension. It consists of beliefs, ideals, values and mental models which are deeply ingrained in us and which we often take for granted. While difficult to articulate, this cognitive dimension of tacit knowledge shapes the way we perceive the world [6].

There are four possible conversion paths between these two types of knowledge: *socialization* which involves capturing tacit knowledge through physical proximity and disseminating it among colleagues, *externalization* which means the translation of tacit knowledge in comprehensible forms that can be understood by others and also translation of highly professional knowledge in explicit knowledge, *combination* in which stage are taking place communication and diffusion processes and the systemization of knowledge and *internalization* when explicit knowledge is embodied in action and practice and in this way it actualizes concepts or methods about strategy, tactics, innovation or improvement [6].

This model (Figure1) illustrates these four paths and the inherent relationships and evolving nature among these four conversions. In an organization, knowledge can be retained at three levels: individual, group, and organization. The model describes how knowledge changes. The process begins in

the socialization quadrant, where knowledge is tacit existing in individuals. This allows exchange of thoughts and ideas between individuals leading to an improved understanding of the system, which results in knowledge creation. Once the tacit knowledge has been created, it can be formalized and standardized in order to be communicated in groups, which leads to explicit knowledge. Once explicit knowledge is created, it can be combined with other explicit knowledge and expressed in a format that it can be retained at the organizational level. The application of explicit knowledge occurs in the final quadrant where each group and individual assimilates and internalizes the knowledge [3]. This four phased model formed the base for generate a self-sufficient model for incorporating knowledge management into ERP continuous improvement lifecycle.

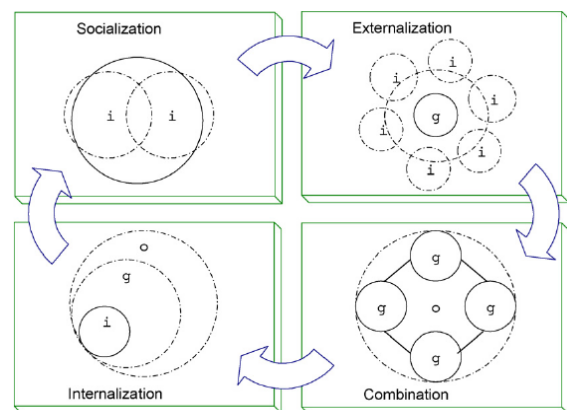


Fig.1. Adapted SECI knowledge spiral from reference [6]. (i) Individual; (g) group; (o) organization

Within the boundaries of ERP systems, organizations tend to focus their efforts on that which is explicit. To be effective knowledge management must enable the conversion of knowledge from the tacit to the explicit [2].

Also, knowledge can be internal or external to an ERP project. Internal knowledge on an ERP project tends to be unique, is highly important in gaining strategic advantages for the organization, is specific and tacit and resides within employees of the organization, embedded in behaviors, procedures and the ERP software. The external knowledge is far less valuable than the first, due to the fact

that it can only provide a new way of thinking in the organization which is also available to competitors, resides in the consultants and the software vendors [9]. The academic literature shows a strong relation between the internal knowledge and ERP project success and a weak relation with the external knowledge [9].

Managing ERP tacit knowledge

The implementation of ERP systems includes the transfer of explicit as well as tacit knowledge of business processes. Transferring explicit knowledge to the adopting organization is part of the standard ERP implementation procedure and methodology and therefore is not as challenging as transferring tacit knowledge which implies communication between the source and the recipient of knowledge.

By focusing on the transfer of explicit and tacit knowledge during enterprise system implementation, this process can be divided into two separate phases: implementation and integration [10]. The implementation phase is not very complex and it implies only to follow the steps (instructions) mentioned in the standard implementation procedure of the ERP system. But in order to complete the knowledge transfer needed in an ERP system implementation it is necessary to also blend all processes that have a organizational dimension and which influences the culture and the way to do business (tacit knowledge) with the adopted ERP system processes. This situation is likely to generate conflicts and therefore in the integration phase, the implementation team might face user resistance problems. Yet, only when this kind of tacit knowledge is integrated into the implementation effort, the organizational members will start to appreciate the value of enterprise system and acknowledge that the integration is one of the most difficult phases in every ERP implementation [10].

In ERP system implementation there are two types of tacit knowledge sharing: the first one manifests between project team members and the second between project team members and external consultants. Both have major implications on the overall implementation

process but especially the second one because after the consultants leave the project the team members have to face knowledge retention problems and new team members can not understand and assimilate all the knowledge necessary to operate with the new system only by studying documents and procedures when part of the knowledge was transferred in tacit form. In order to eliminate problems generated by the imminent departure of external consultants in the practice of ERP systems implementations knowledge sharing can be made part of the contract signed with the external consultancy firm.

There are several factors that influence the transfer of tacit knowledge among team members: the hierarchy established between team members, the atmosphere existent at the work place which can influence the communication capacity of team members, the established structure of team interaction in general [10].

Depending on the organizational strategies, firms may choose to emphasize one of the two tacit knowledge facilitators for tacit knowledge sharing in enterprise system teams. In practice project managers can't eliminate ranks among team members in order to establish an atmosphere of communication and to stimulate sharing ideas. In this way the tacit knowledge is surfaced and the process of transforming it in explicit knowledge and internalization can begin. Proper utilization of each method can assist the adopting organization in overcoming the difficulties of tacit knowledge sharing.

The challenge for knowledge management is to identify those tacit knowledge domains possessing potential value for the organization that adopted the ERP system and converting them into actual value. If organizations want to identify and develop new knowledge domains they must seek the input of knowledge communities and communities of practice composed of the different groups involved in different stages of the enterprise system life cycle in order to overcome the difficulties of transferring (by means of knowledge networks [2]) such knowledge across the entire organization, from where it

resides to where it is needed.

The distinction between explicit and tacit knowledge is practically what makes the difference when implementing the same ERP system with the same set of business practices in different organizations. If an organization wants to get the most out of the implementation effort it needs to know how to handle the existent tacit knowledge capabilities and blend them with the adopted business process ERP system specific.

Conclusions and discussions

The first part of this article is concentrated on the different types of ERP knowledge with emphasis on tacit knowledge. Then the essence of effective knowledge management, the conversion process of ERP tacit knowledge in ERP explicit knowledge is presented. As stated by several authors, this process maps perfectly on the phases of the ERP system life cycle and leads to the creation of a model for incorporating knowledge management into ERP continuous improvement lifecycle.

The second part of the article underlines tacit knowledge management issues. The integration of tacit knowledge is a key problem in any ERP system implementation because tacit knowledge is embedded in complex organizational processes, in legacy systems, in externally based processes. In order to overcome these impediments to knowledge integration the ERP project management must stimulate the development of interpersonal relations and community relations among organization's individuals to surface the tacit knowledge and as much as possible to convert it into explicit knowledge and map it on the new adopted processes of the ERP system. Tacitness of a great part of enterprise system knowledge implies that an effective knowledge management policy must be in place to ensure that the implementation is not simplified to installing a software package. If tacit knowledge management will refer the internalization of tacit knowledge (which can mitigate the negative effects of the organizational resistance) it is expectable that the new system will add to the competitive advantag-

es of the adopting organization. The competitive advantage arises from the organization's capabilities in internalizing and integrating the adopted processes and their knowledge paradigm into the organization during the enterprise system implementation project.

The organization's culture is also a key driver and inhibitor of tacit knowledge sharing and may also be thought of as knowledge resource because it provides the context within which organizational members create, acquire, share, and manage knowledge. Because the organization's culture influences member's attitudes towards tacit knowledge sharing and because tacit knowledge sharing is critical to successful ERP implementation, it is important to understand the relationship between culture and tacit knowledge sharing and develop theory that contributes to successful ERP implementation. Therefore, a possible future research, based upon the current study, could investigate at which extent cultural barriers affect the sharing of tacit knowledge.

In conclusion, this study provide insights into the nature of several impediments that underlie many ERP implementations and suggests that systematic incorporation of tacit knowledge management into ERP project management is strategic, critical and correlated with the overall success of the ERP system implementation. The extent of this correlation may also be the subject of a future empirical study.

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