



A Conceptual Framework of ES Implementation: Towards a Social Capital-Based Knowledge Integration Perspective

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ABSTRACT

In this paper, we aim to examine the social capital roles that are influencing knowledge integration in the context of enterprise systems (ES) implementation. The two specific objectives of this study are: (1) to explore the role played by social capital in knowledge integration; (2) to discover the enablers and hindrances in the two different types of knowledge integration process, i.e. "Mechanistic pooling" [11] and "Generative" [2] knowledge integration in the ES implementation project. In order to achieve these objectives in the context of ES implementation project, a conceptual framework is presented by using Nahapiet and Ghoshal's [14] social capital dimensions to examine its roles played in the two different types of knowledge integration. This article presents the theoretical foundation of the proposed framework and outlines the theoretical and managerial contributions of this research.

INTRODUCTION

ES are viewed as the most important development in the corporate use of IT owing to their functions to integrate all information flow in an organization [3]. The tasks to integrate the different interests of various customer groups, countries and industries have compelled ES to become a network of very comprehensive and complex systems [17]. Successful integration of knowledge requires the ability to overcome dispersed, differentiated and embedded nature of knowledge [16; 9]. In view of this, we aim to explore knowledge integration process, from ES implementation perspective, mainly because integration of knowledge has been a key problem in ES implementation [16].

Previous studies have noted that knowledge integration theories have under-emphasized the role of social capital in knowledge integration conceptualization [10]. Thus, we propose to use Nahapiet and Ghoshal's [14] social capital framework in the study of knowledge integration process to close the gap between social capital and knowledge integration theories. A conceptual framework (refer to Figure 1) is proposed (1) to study the role of social capital in knowledge integration process and (2) to discover the enablers and hindrances occurred in knowledge integration processes in the ES implementation project. The following section sets the stage for the study by providing a background on ES, knowledge integration and social capital with an attempt to highlight the role of social capital in knowledge integration.

LITERATURE REVIEW AND THEORETICAL FOUNDATION

Enterprise Systems

ES are packaged software that embeds industry-wide "best practices" and integrates business's functions and processes into a single comprehensive framework. Practically, ES tend to impose "their own

logic on a company's strategy, organization, and culture" [3; p. 121]. The complex nature of ES has required the adopting companies to appropriately map-up their project team members with a good mix of knowledge, skills and expertises [19]. The systems also require companies to challenge the mapping of existing organizational processes, identify the embedded processes the systems, and redefine new organizational processes that fit both the software and the organization itself [18]. All these challenges critically require the integration of knowledge that is dispersed, differentiated and embedded [16] among individuals, organizations and the ES. Thus, to better understand the ES implementation phenomenon, we choose to examine it from a knowledge integration perspective.

Knowledge Integration

Knowledge integration has been identified as the "on-going collective processes of constructing, articulating and redefining shared beliefs through the social interaction of organizational members" [8; p. 15]. This definition implies that social interactions play an important role among organizational members for knowledge integration. The ability to integrate or bring specialized knowledge together is one of the most prominent driving forces for long-term profitability and survival that is not easy to be imitated by competitors. In this way an organization is able to sustain its competitive advantage position [5]. Having reviewed literatures on the importance of knowledge integration, we find that knowledge integration can be categorized into two rather different modes: "Mechanistic pooling" [11] and "Generative" [2].

Mechanistic Pooling versus Generative Knowledge Integration

In general, knowledge can either be integrated automatically through the implementation of IT (e.g., in car manufacturing processes) or it has to be initiated by humans and supported by IT (e.g. in designing of machines). Based on these two different concepts, we posit that there are two types of knowledge integration in the context of an ES project team – "mechanistic pooling" [11] and "generative" [2] knowledge integration.

Mechanistic pooling refers to the gathering of knowledge from individuals with different specialized knowledge [11]. To the proponents of this view, the overall IT systems comprise of independent jigsaw pieces that can be fitted together [8]. This idea is the least threatening to the prevailing identities and vested interests because each individual takes care of each piece of the jigsaw puzzle and keeps communication with other members to a minimum [8]. From a mechanistic pooling perspective, knowledge is likely to result in ES that computerize the existing manual systems or are inclined to replace the

legacy systems. The systems are unlikely to lead to any radical change in tasks or processes.

On the other hand, generative knowledge integration has the ability to create new knowledge. In this concept, knowledge is used as a tool for productive inquiry [2], while the combination of knowledge can be used to achieve joint knowledge production together with the experimentation [13] among individuals from diverse backgrounds [4]. This concept proposes more interactions with the social and physical worlds so as to generate new knowledge and new ways of knowing [2].

In summary, the above two types of knowledge integration processes have shed light into possible ways for knowledge to be integrated in ES. We find that, for knowledge to be integrated among individuals there is a need of strong social network connection. Thus, in this study, we propose to adopt social capital theory, as the central proposition of this theory suggests that individuals may access to valuable resources through the conduct of social affairs or social networks [15]. The important role of social capital will be further explored in the following paragraphs in order to understand the influence knowledge integration during ES implementation.

Social Capital

The success of ES project will depend on the ability to integrate knowledge and information flow between human and systems. To acquire disparate and specialized knowledge, and enable knowledge to be integrated, organizations like Boston Consulting Group and McKinsey have emphasized the importance of building networks of people [7]. This is simply because knowledge is shared mainly through person-to-person contacts and is unlikely that team members will have all the relevant knowledge and expertise. Therefore, they will need to built-up high degree of closure in the network structure between individuals so that knowledge can be exchanged [6]. In view of these, social capital would, therefore, appear to have fundamental importance for knowledge to be integrated between project team members.

Here, we employ Nahapiet and Ghoshal's [14] framework because it clearly illustrates the linkage between social capital and organizational knowledge [12]. We view social capital as "the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or a social unit" [14, pp. 243]. Social capital, therefore, not only encourages good relationships between individuals, but also serves as an essential network support to facilitate inter-unit resource exchanges [6]. According to Nahapiet and Ghoshal [14], there are three dimensions of social capital and their roles played in influencing knowledge integration process will be examined in the following paragraphs.

Structural Dimension

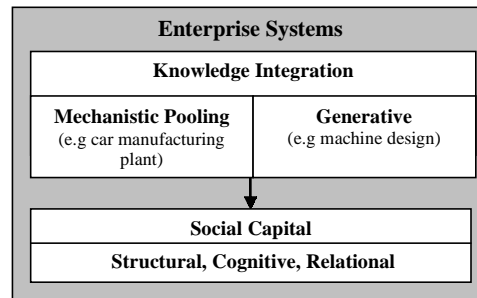
The structural dimension proposed by Nahapiet and Ghoshal's [14] refers to the connection patterns between actors, including *network ties, configuration and the appropriable organization*. Structural dimension is important, as it enables an individual to possess valuable information from its network [1].

Basically, *network ties* provide access to resources, while *configuration ties* offer the right channel for information transmission. In definition, *appropriable organization* refers to norms and trust that may influence patterns of social exchange [14]. The existence and importance of these factors will be considered in the study to examine how they may help ES project team members to access information needed, with the aid from social network to accomplish their tasks.

Cognitive Dimension

This dimension represents shared understanding, interpretations, and systems of meanings between parties achieved through *shared language, code and narratives* [14]. These attributes are contributing to the establishment of common knowledge that is particularly important for knowledge to be integrated [4]. For example, in ES project team, once members from different departments are able to establish cognitive dimension between each others, issues like insufficient mutual understanding can be resolved and the knowledge boundaries between individuals can also be bridged [9]. Thus, we propose to consider the existence

Figure 1: Proposed conceptual framework



and role of these attributes during the knowledge integration process throughout the ES implementation project.

Relational Dimension

The relational dimension refers to assets that are created and leveraged through relationships. It includes attributes like *trust, norms, obligations and expectations and identification* [14]. This dimension deals with the anticipation, motivation of parties to engage in exchanging and combining their knowledge with others. For example, we would expect up to a certain extent, individuals from ES project team are ready to exchange or cooperate with each other, simply because they hold the similar obligations and expectations from their project team leader. But, the depth of additional knowledge shared and integrated between them is still yet to be explored here. Therefore, in this study we propose that the existence of these attributes should be taken into consideration and to be explored among the ES project team members on whether the relational dimension may actually impinge on the knowledge integration process.

In summary, in the view of current ES implementation issues, we propose to study ES issues from the knowledge integration perspective. Based on our review of the relevant literatures, we find that the two different types of knowledge integration processes: "Mechanistic pooling" [11] and "Generative" [2] knowledge integration may have impact on the success of ES implementation. So, to better understand the knowledge integration processes, we adopt Nahapiet and Ghoshal's [14] social capital dimensions to examine the roles of social capital in knowledge integration process. A framework is constructed to examine the social capital roles of knowledge integration in the context of ES implementation.

CONCLUSION AND CONTRIBUTIONS

This study primarily focuses on ES implementation as a phenomenon. ES comprise of technological tasks as well as activities involving the integration of knowledge by multiple parties in the project team. In view of this, this paper examines the social capital roles that influence knowledge integration in ES implementation. The theoretical and managerial contributions of this study are summarized in the following.

Theoretical Contributions

The first theoretical contribution of this study applies the two types of knowledge integration: mechanistic pooling and generative in the ES implementation. From these two types of knowledge integration, the ES implementation initiative can be differentiated. Furthermore, they also enable researchers to better understand, identify and categorize two types of knowledge integration issues so that problems can be taken care of. Issues that are more likely to occur in mechanistic pooling would be considered as the hard factors, for example, system which is unstable and not able to provide the management with the monthly sales records. On the other hand, some examples of soft factor in generative knowledge integration are insufficient communications and lack of common knowledge. The ability to differentiate these issues will provide researchers with clearer directions for further exploration and examination on knowledge integration process issues.

The second theoretical contribution is the inclusion of social capital into the knowledge integration theory conceptualization. In

achieving this objective, we consider the different dimensions of social capital in order to examine its role in knowledge integration. From our research, we have examined the roles played by the social capital in influencing the knowledge integration process. Furthermore, we realize that the enablers and hindrances in the two different types of knowledge integration process are highly related to the Nahapiet and Ghosal's [14] three social capital dimensions. Therefore, we propose that, in order to enable knowledge to be integrated successfully, researchers should pay more attention to further explore the ways to nurture, encourage and maintain the social capital among individuals in the ES project team.

Managerial Contributions

From the managerial point of view, the proposed framework may assist managers (1) to recognize the different types of knowledge integration processes and provide managers with better knowledge in coping with the possible arising issues during knowledge integration process, (2) to understand the roles played by the social capital in affecting ES project team members, and thus, enabling managers to pay more attention on human-factors related issues rather than technological issues, and (3) to appropriately handle knowledge integration issues during ES implementation, as managers have understood the important roles played by social capital in the two different types of knowledge integration proposed in this study.

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