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Using Stakeholder Theory to Analyze Knowledge Sharing During Enterprise Systems Implementations

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Abstract

Enterprise Systems (ES) are comprehensive yet complex systems to implement, involving numerous stakeholders, each with specific domain knowledge, which are crucial to the success of the ES project. It would therefore be prudent for greater attention to be given to the study of knowledge sharing during ES implementations. This is a conceptual paper, which begins with an overview of why stakeholders and their domain knowledge are important to ES projects. Next, it highlights four key categories of stakeholders involved in ES implementations, and their dynamic nature during the project. It then applies the concepts of stakeholder theory to analyze stakeholder knowledge sharing during ES implementations in three areas. Firstly, it looks at stakeholder identification of the relevant stakeholders and their domain knowledge. Secondly, it considers stakeholder prioritization of the more important stakeholders and domain knowledge in each phase of the project. Thirdly, it looks at stakeholder management of inter-stakeholder knowledge sharing. Finally, this study presents seven propositions that can serve as potential areas for future research.

Keywords: Enterprise systems, Stakeholder theory, Knowledge sharing

1. Introduction

Enterprise Systems are large, comprehensive systems that are highly complex to implement and manage, involving large groups of people and resources (Oliver & Romm 2002; Rosemann & Watson 2002), which evolved from Enterprise Resource Planning (ERP) systems. As ERP systems grew in scope, Davenport (1998) noted that ERP was too narrow a term to denote enterprise-wide integrated systems, and suggested that the term Enterprise Systems (ES) be used instead (Rosemann & Watson 2002). Today, ES refer to any pre-packaged enterprise-wide system that integrates an organization's operations into a single system with a shared database (Lee & Lee 2000; Newell et al. 2003; Sedera et al. 2003), such as Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), and Supply Chain Management (SCM) systems (Brown & Vessey 2003; Shaw 2000).

ES, as a distinct phenomenon of interest, are an under researched area in IS curricula (Klaus et al. 2000; Rosemann & Watson 2002; Sathish et al. 2003). This is surprising given the significant proportion of ES project failures (Sarker & Lee 2003). At best, these result in huge losses, as in Dell Computers, which spent US\$30 million before abandoning its SAP project (Staehr et al. 2002). At worst, they could lead to cases such as FoxMeyer Drugs, which filed for bankruptcy when its SAP R/3 project went badly wrong and FoxMeyer ended up suing its implementation partners, SAP and Anderson Consulting (Volkoff & Sawyer 2001). More research on ES is thus required to potentially improve their success rate.

Notably, studies on the stakeholders involved in ES projects, such as users and IT staff, have been advocated in recent literature (Pouloudi 1999), but past research on this has been on a small scale with each group considered individually. In reality, ES projects involve many different stakeholders, both from within and without the organization (Schneider 2002), who possess knowledge, which facilitates their roles during ES projects and interactions with one another. Such knowledge consists of relevant information that is actionable and based at least partially on experience (Massey et al. 2001). Given their importance as sources of knowledge, any ES project model should thus include them (Davenport 1994), so organizations can consolidate and reconcile their intellectual capital, or knowledge assets, for organizational advantage (Gold et al. 2001; Khalifah et al. 2001; Massey et al. 2001). The rest of this study follows the assumption that organizations are generally aware of what domain knowledge their stakeholders possess.

Although such stakeholder studies may seem obvious (Pouloudi 1999), there has been little application of stakeholder analysis concepts, particularly in the context of knowledge sharing during ES implementations. This study aims to contribute towards bridging this gap in ES implementation literature by proposing a stakeholder perspective of knowledge sharing during ES projects. An in-depth study of relevant stakeholders and how they share knowledge during ES implementations can provide greater insight into their impact on the project and each other, and how they should be managed to maximize their contributions.

This study proposes Stakeholder Theory as a lens to look at stakeholder knowledge sharing during ES implementations. Stakeholder Theory focuses on the people factor instead of the technical factors of ES projects. It looks at who (or what) are the stakeholders of an organization, to whom (or what) should organizations pay attention (Freeman 1984), and advocates the study of the important yet under-researched issue of how the organization should manage stakeholders who vary in importance (Jawahar & McLaughlin 2001).

This study is a conceptual paper, which begins with a look at why organizations should focus on their stakeholders during their ES implementation efforts. It then looks at who the stakeholder of ES implementations are and their dynamic nature during these projects. Finally, this study applies the concepts of stakeholder analysis to ES implementations, and presents several propositions that identify potential areas for future research.

2. Why the Need to Focus on the Stakeholders of ES Implementations

Due to the size and complexity of ES, organizations generally outsource their development or purchase pre-packaged systems (Reimers 2003; Scheer & Habermann 2000; Willcocks & Sykes 2000). Since ES implementations require a different set of tasks, skills and expertise from traditional in-house systems (Hirt & Swanson 2001), this is a way of getting the necessary knowledge from experienced external experts to plug this gap (Sumner 2000).

Despite this, many researchers have focused on stakeholders such as customers, and failed to foresee the rising importance of external third parties (Hirt & Swanson 2001). This is surprising as ES projects are the start of long-term relationships between organizations and these external parties (Markus & Tanis 2000), as organizational dependence on them increases as ES complexity increases (Davenport 2000; Nah et al. 2001). Organizations thus need to understand and manage the impact the introduction of external parties can have on internal stakeholders, and the acquisition of knowledge from these external parties.

ES also impose their own logic on the organization's strategy and culture (Davenport 1998), based on the knowledge and experience accumulated from previous implementations (Shang & Seddon 2002). The question for organizations is thus whether changes to the organization or system are needed to support these best practices, and how they should be managed (Kræmmergaard & Rose 2002; Murray & Coffin 2001).

Changing the system may cater to unique organizational requirements (Light 2001) and increase differentiation from competitors (Kremers & Van Dissel 2000), but it can be difficult, costly and risky (Jones & Price 2001; Lee & Lee 2000; Sumner 2000), and may cause complications during future upgrades (Hong & Kim 2002; Soh et al. 2000). Alternatively, organizations can reengineer their business processes to support these best practices (Adam & O'Doherty 2000; Kremers & Van Dissel 2000), but this can be rather tedious (Robey et al. 2002), particularly if the organization's business schemes cannot be reconciled to the system's pre-defined standards (Lee et al. 2003). In either case, the roles and responsibilities of the stakeholders may vary, and organizations need to identify new ways of involving them and managing their knowledge.

Integration is another core objective for organizations implementing ES (Oliver & Romm 2002; Singletary 2002). It can involve the integration of modules (Klaus et al. 2000), organizational functions (Nah et al. 2001), or information across these functional units (Jones & Price 2001). ES integration is a complex process (Kræmmergaard & Rose 2002; Sousa 2002), which can affect the entire organization (Reimers 2003) or even the inter-organizational supply chain (Davenport 2000). Since ES integration can potentially affect numerous stakeholders both within and without the organization, each with their own domain knowledge, logically, ES implementations should involve all these diverse stakeholders, and organizations should facilitate knowledge sharing between them.

These three issues, namely the use of external vendors, the best practices that come with pre-packaged systems, and the potential for integration, emphasize the need for stakeholders with different domain knowledge during ES implementations. This is particularly so since most of the knowledge required for the project that people really care about isn't on computers (Davenport 1994), but comes from them. As this knowledge is generally personalized, before one stakeholder's knowledge is useful to another stakeholder, it must be communicated from where it was created or captured to where it is needed and should be used in such a manner as to be interpretable and accessible to the other (Alavi & Leidner 1999; Massey et al. 2001). Organizations should thus identify the stakeholders who possess the required knowledge, prioritize whose knowledge, and thus which stakeholder, is more important at different times in the project, and facilitate the sharing of knowledge amongst all their stakeholders.

3. The Stakeholders of ES Implementations

Stakeholder Theory views an organization as a system of stakeholders. A stakeholder can be any group or individual who can affect or be affected by the achievement of an organization's purpose (Chan et al. 2003; Freeman 1984; Sathish et al. 2003), which in this case is the implementation of ES. Stakeholders previously identified include customers, employees, suppliers, competitors, shareholders, government agencies (Adelakun, & Jennex 2002; Davenport 1998; Greenley & Foxall 1998), board members (Scott & Lane 2000), top management (Clarkson 1995; Davenport 1998), and external parties (Hirt & Swanson 2001). This study focuses on four main categories of ES project stakeholders, namely management, end-users, IT staff and external parties (see Table 1).

Stakeholder Categories	Sample Stakeholders	Domain Knowledge
Management	Top organizational managers, Project managers, Project champion	Business strategy
End-Users	Internal staff, External customers	Business processes
Internal IS Staff	Permanent IS staff, Contract IS staff	Organizational IS
External Parties	Vendors, Consultants	Enterprise systems

Table 1. The Main Stakeholder Categories of ES Implementations and their Domain Knowledge.

Management includes top organizational managers, ES project managers and the project champion. Their active (Brown & Vessey 2003), strong and committed (Sarker & Lee 2003) support of the project reinforces their backing of the project (Akkermans & Helden 2002), which is crucial, given its complex and comprehensive enterprise-wide nature. They utilize their strategic knowledge to set the ES vision, establish strategic priorities, and facilitate a suitable culture to move the organization in the direction of that vision (Khalifah et al. 2001).

End-users include organizational staff using the system and external customers. They possess the necessary know-how of the business processes, which need to be mapped to the system's configurations (Hirt & Swanson 2001; Howcroft & Light 2002). ES projects are more likely to succeed if end-user involvement and understanding is high, and they have realistic project expectations (Kræmmergaard & Rose 2002). End-users also require extensive training (Lorenzo 2001) from the external parties, to acquire the knowledge and skills to handle the system (Baskerville et al. 2000). Furthermore, employees should be able to self-organize their own knowledge to facilitate solutions to problems and share knowledge with other stakeholders (Gold et al. 2001).

The third category is the internal IS staff, which includes permanent and contract IS staff in the organization working on the technical implementation of the system. With ES developed by external parties, the role of IS staff during ES projects is significantly different (Hirt & Swanson 2001). They require skills oriented towards combining systems, or package, and business knowledge (Baskerville et al. 2000). They are thus involved with gathering knowledge from external parties on ES, from end-users on business requirements, and sharing their own knowledge on the internal systems with other stakeholders.

The final category is the external parties, which includes third-party vendors who develop ES and external consultants who facilitate its implementation. They are important as organizations lack the necessary skills and knowledge to develop and maintain their own enterprise-wide systems (Hirt & Swanson 2001). Consequently, as many as a dozen or more external agencies – such as vendors of ES, ES extensions and supporting hardware, and consultants – may be involved in different aspects of the ES experience, and coordinating their contributions and knowledge is, to put it mildly, a challenge (Markus et al. 2000).

ES implementations involve project teams (Newell et al. 2002). However, it is unlikely that a homogeneous team has all the relevant knowledge and expertise (Newell et al. 2002), as much of the knowledge needed for ES projects is split amongst multiple stakeholders (Thomas-Hunt et al. 2003). Hence, the team should be well-balanced and involve all four categories to ensure a good mix of knowledge, skills and experience (Sarker & Lee 2003; Staehr et al. 2002). It should also include both internal and external personnel to enable internal staff to “grow” the necessary skills for future ES projects (Sumner 2000). For these

teams to reach their performance potential, the organization needs to capitalize on its member resources by accurately discerning, weighting and incorporating their task-relevant knowledge (Thomas-Hunt et al. 2003).

This study adapts the Extended Relational Foundations (ERF) model by Hirt and Swanson (2001) to show the potential relationships between these four stakeholder categories (see Figure 1). This version differs from the original model in that it only includes human actors, whereas the original model included non-human actors, such as application systems. Furthermore, this version also includes Management as one its entities, as the authors feel that this is a vital stakeholder category that was excluded from the original model.

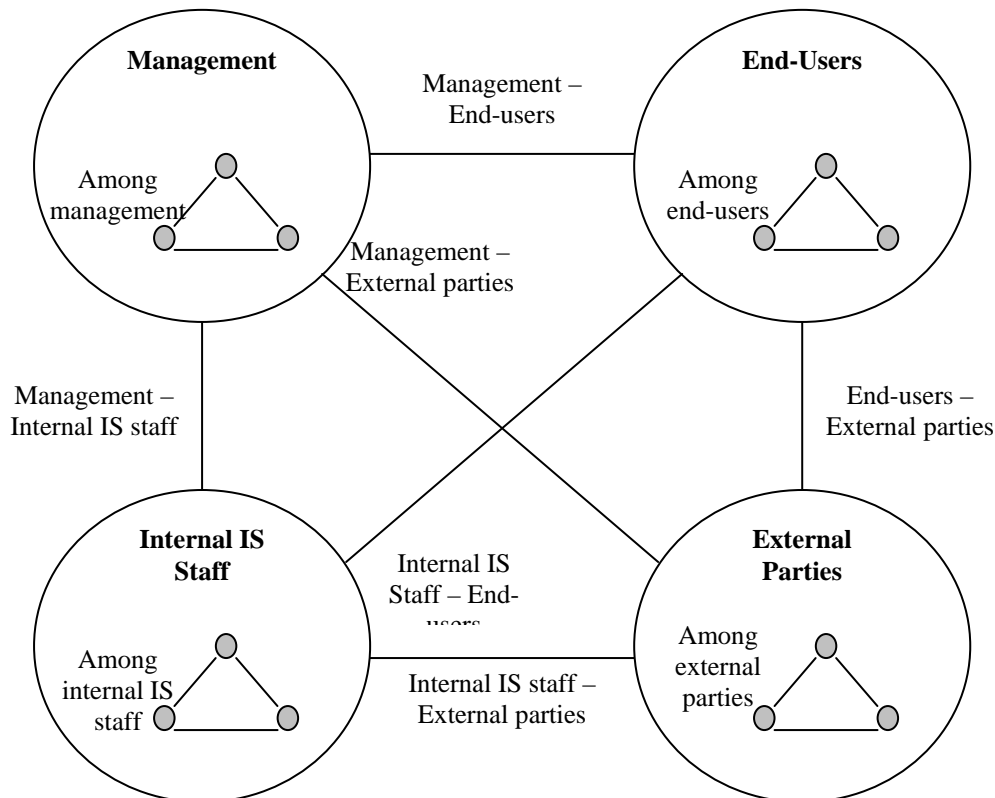


Figure 1. *Extended Relational Foundations (ERF) Model (Adapted from Hirt & Swanson 2001).*

This model highlights two issues concerning stakeholder analysis. Firstly, both internal and external stakeholders should be studied, as the desired knowledge for the project needs to be acquired from throughout the organization and from the external parties. Secondly, both inter- and intra-relationships between stakeholders should be studied, as each stakeholder category could include several different stakeholders, each with their own domain knowledge. As such, knowledge sharing among these stakeholders should also be facilitated, before their consolidated knowledge can be shared with the other stakeholder groups.

4. The Dynamic Nature of these Stakeholders

Although the identification and management of relevant stakeholders of ES projects and their domain knowledge may appear straightforward, it is actually rather complex as ES implementations are not static processes. Instead, they iteratively traverse several phases (Chang et al. 2000), each of which is characterized by its own key players, activities and

outcomes (Markus & Tanis 2000). In particular, stakeholders, their roles and interactions vary according to the phase in which they are (Pouloudi 1999). A theoretical ES life cycle model that highlights this fact is the widely referenced model developed by Markus & Tanis (2000) (see Figure 2) which consists of four phases; the Project Chartering, Project, Shakedown, and Onward and Upward phases (Markus & Tanis, 2000; Staehr et al. 2002).

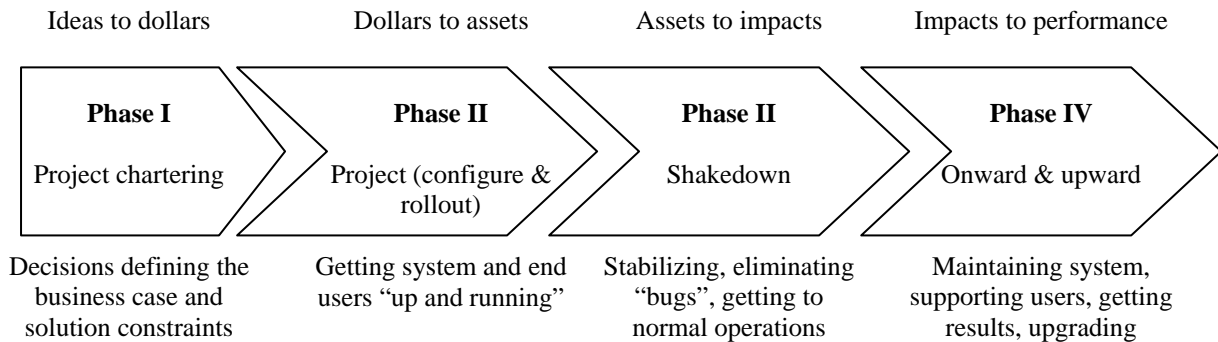


Figure 2. Enterprise Systems Project Life Cycle (Markus & Tanis, 2000).

Alternatively, SAP's Accelerated SAP (ASAP) methodology is a more practical model consisting of five phases, which is used by organizations implementing SAP systems (see Figure 3). In the Project Preparation phase, the project team is finalized, the need for additional hardware is reviewed, and the high-level project plan is completed. In the Business Blueprint phase, a blueprint is developed to understand the organization's business goals and determine the business processes to support them, and key users attend the customized SAP training. In the Realization phase, the team and SAP consultants co-configure the business processes identified in the blueprint, and play them back to the users for feedback and confirmation of the blueprint. In the Final Preparation phase, the team completes final systems testing, trains users, cuts-over the data and system to the production environment, and gets approval for the system to go live. Finally, in the Go-Live and Support phase, the system is reviewed and refined to ensure that the business environment is fully supported.

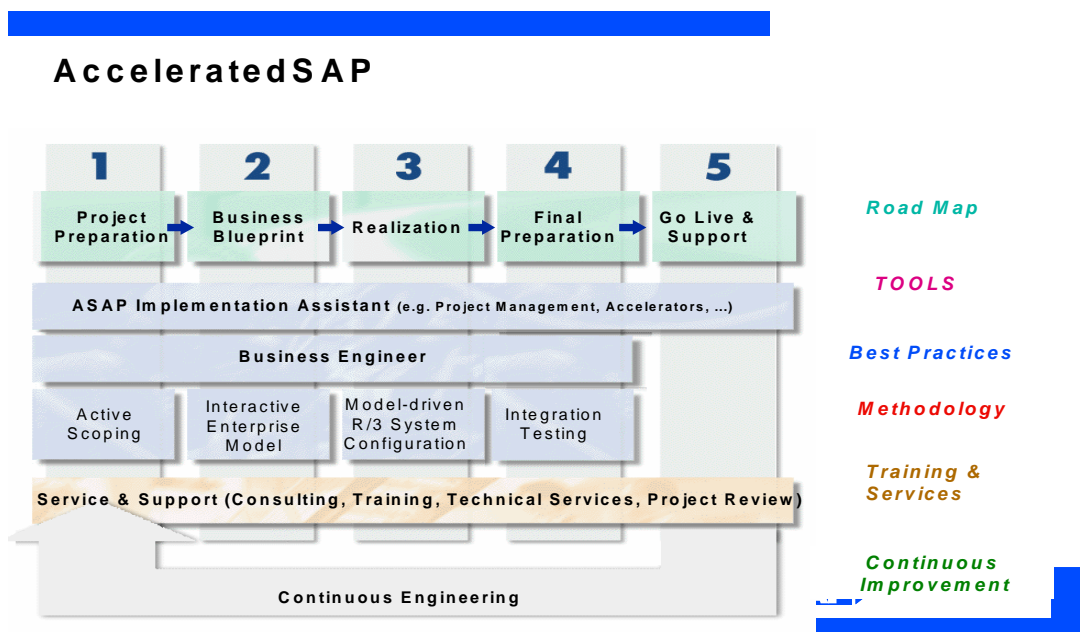


Figure 3. Accelerated SAP (ASAP) Model.

This study suggests that by themselves, both models are insufficient for a stakeholder analysis of ES implementations. The Markus & Tanis (2000) theoretical model could benefit from a clearer breakdown of the distinct groups of activities in its Project phase. As for the ASAP model, it lacks an explicit Post-Implementation phase as the relationship between the organization and vendor usually only lasts until the system has stabilized. This study thus combines these two models to develop a six-step ES project life cycle model, which better highlights the phases of an ES project (see Table 2). Each phase of this six-step model also has its own key activities and relevant stakeholders (see Table 3).

Markus & Tanis (2000)'s Theoretical Model	Accelerated SAP (ASAP) Practical Model	Six-Step ES Project Life Cycle Model
Project Chartering phase	Project Preparation phase	Project Preparation phase
Project phase	Business Blueprint phase	Business Blueprint phase
	Realization phase	Realization phase
	Final Preparation phase	Final Preparation phase
Shakedown phase	Go-Live and Support phase	Go-Live phase
Onward & Upward phase	No corresponding phase	Post-Implementation phase

Table 2. Six-Step ES Project Life Cycle Model.

It should be noted that the intensity of different stakeholders' involvement in a particular phase may vary. For example, during the project preparation phase, although management, internal IS staff and external parties are involved, management is probably a more important participant as they make the strategic decisions, such as approving the project. Similarly, during the business blueprint phase, the end-users are probably the primary stakeholders as they supply the business knowledge, while the rest have moderate supporting roles.

Phases	Key Activities	Key Stakeholder Categories
Project preparation	<ul style="list-style-type: none"> • Conduct feasibility study • Identify a project manager • Finalize the project team • Approve a budget and schedule • Prepare, review and sign-off on a high-level project plan 	<ul style="list-style-type: none"> • Management (Primary) • External parties • Internal IS staff
Business blueprint	<ul style="list-style-type: none"> • Project team training • Requirements gathering • Produce, review and sign-off on a business blueprint 	<ul style="list-style-type: none"> • End-users (Primary) • External parties • Internal IS staff • Management
Realization	<ul style="list-style-type: none"> • Produce and review design specifications for configuration • Configure business processes • Initial review and test of configured business processes • Go-live check 	<ul style="list-style-type: none"> • External parties (Primary) • Internal IS staff (Primary) • End-users • Management
Final preparation	<ul style="list-style-type: none"> • Final testing • Prepare production environment • Data migration to production environment 	<ul style="list-style-type: none"> • End-users (Primary) • External parties (Primary) • Internal IS staff (Primary) • Management

	<ul style="list-style-type: none"> • End-user training • Role-user assignment • Approve system and organizational readiness to go-live • Create go-live strategy 	
Go-live	<ul style="list-style-type: none"> • Bug fixing and rework • System performance tuning • Retraining • Staffing up to handle temporary inefficiencies 	<ul style="list-style-type: none"> • End-users (Primary) • Internal IS staff (Primary) • External parties • Management
Post-implementation	<ul style="list-style-type: none"> • Continuous business improvement • Additional user skill building • Technology upgrading 	<ul style="list-style-type: none"> • End-users (Primary) • Internal IS staff • Management

Table 3. Key Activities and Stakeholder Categories of Six-Step ES Project Life Cycle Model.

5. A Stakeholder Analysis of Knowledge Sharing During ES Implementations

This study now looks to apply Stakeholder Theory to the analysis of knowledge sharing during ES implementations. In particular, three phases of stakeholder analysis are considered; stakeholder identification, stakeholder prioritization and stakeholder management.

5.1 Stakeholder Identification

In line with existing Stakeholder Theory models, the first step of stakeholder analysis of knowledge sharing during ES implementations is the identification of the stakeholders involved in the project (Frooman 1999; Wolfe & Putler 2002) and their domain knowledge. All relevant stakeholders should be identified so organizations have a holistic picture of the parties who can contribute the knowledge required for the project. However, stakeholder's willingness and ability to share knowledge are based on both the organization's relationships with the stakeholder as well as the interaction of multiple influences from other stakeholders (Nambisan & Agarwal 1998; Rowley 1997). Hence, stakeholder identification should also cover their inter-relationships, which represent the flow of knowledge during the project. Given the dynamic life cycles of ES projects and stakeholder involvement (see Table 3), stakeholder identification should be conducted separately for each phase of the ES project life cycle. Based on this argument, this study proposes the following three propositions:

Proposition 1: The relevant stakeholders who can contribute the required knowledge during ES implementations can be identified based on the activities during the project.

Proposition 2: The inter-relationships between the relevant stakeholders who can contribute the required knowledge during ES implementations can be identified based on the activities during the project.

Proposition 3: The required knowledge and relevant stakeholders during ES implementations vary according to the phases of ES project life cycle.

To better explain all the propositions presented here, let us consider an organization which is implementing a new ES system. In the Project Preparation phase (see Table 3), the feasibility study might be spearheaded by management, based on input from its IS staff and the external consultants. The remaining activities are usually mainly handled by management. From here,

we can see that the three stakeholder categories involved in this phase are management, external parties and internal IS staff, with the management being the most important stakeholder, as they oversee and approve the activities in this phase. This exemplifies how the first proposition can potentially hold true.

To better explain the second proposition, we consider two activities during the Business Blueprint phase; project team training and requirement gathering. During project team training, information could flow from the external parties to internal IS staff in briefings on what to do during the project. There is thus a relationship between these stakeholders. During requirements gathering, the external parties and internal IS staff could be gathering the requirements from the end-users, thus indicating a web of relationships and information flow between these three parties. Together, these two sets of relationships show the overall web of the stakeholder inter-relationships during this phase of the project.

To better explain the third proposition, we can consider how although all four stakeholder categories are involved in the Business Blueprint and Realization phases of the project, their involvement in each phase varies. In the Business Blueprint phase, the primary stakeholder is the end-users who are the main source of business knowledge, which is required to plan what the system should entail. In the Realization phase, the end-users are less important as the emphasis shifts to configuring the system. Hence, the external parties and internal IS staff become more important as they possess the technical knowledge on how to design the ES and integrate it with existing organizational systems.

5.2 Stakeholder Prioritization

Having identified the relevant stakeholders of ES projects and their domain knowledge, the next issue is to differentiate who deserves greater priority. Though organizations should aim to meet the needs of all stakeholders, simultaneously fulfilling their responsibilities towards all these stakeholders is highly unlikely (Jawahar & McLaughlin 2001), especially given the limited resources available. Mitchell et al. (1997) identified three characteristics that differentiate stakeholders, that is, power, legitimacy and urgency (Sathish et al. 2003). These attributes are variable and can change for any particular stakeholder (Mitchell et al. 1997; Sathish et al. 2003). This study suggests that since ES implementation stakeholders have different domain knowledge and the need for this knowledge varies throughout the project, domain knowledge is the fourth attribute that affects their importance to the project. Based on this argument, this study proposes the following proposition:

Proposition 4: A stakeholder's domain knowledge, degree of power, legitimacy and urgency is associated with his importance during the implementation of enterprise systems.

To better explain this proposition, we can consider the Business Blueprint and Realization phases. During the Business Blueprint phase, the primary stakeholders are the end-users due to their business knowledge. During the Realization phase, the primary stakeholders are the external parties and internal IS staff, largely because the external parties possess ERP knowledge while the IS staff possess knowledge of existing organizational systems, both of which are required to facilitate the configuration of the proposed system.

5.3 Stakeholder Management

Knowing the stakeholders who possess the desired knowledge for ES projects is one thing. Doing something about it is another. The emphasis of stakeholder theorists has thus far been on stakeholder identification and prioritization. There is now a need to go beyond this and

study how organizations should actually manage their different stakeholders (Jawahar & McLaughlin 2001). This is crucial as only by acting on their understanding of stakeholder differences, can organizations better utilize their stakeholders' knowledge during ES projects.

An important part of the management process is the formation of a well-balanced project team with representatives from all four stakeholder categories to ensure that the team has the best mix of knowledge, skills and experience required by ES projects (Sarker & Lee 2003; Staehr et al. 2002; Willcocks & Sykes 2000). This team should be flexible since stakeholders are dynamic during ES projects, with their roles and interactions varying according to the phase they are in (Pouloudi 1999). Stakeholder knowledge sharing can also be facilitated via the underlying technologies that connect the stakeholders (Henfridsson & Holmstrom 2002). Such technologies comprise a crucial element of the structural dimension needed to mobilize social capital for the creation of new knowledge (Gold et al. 2001). Based on this argument, this study proposes the following two propositions:

Proposition 5: A flexible and well-balanced project team is associated with the sharing of knowledge among stakeholders.

Proposition 6: The underlying technologies are associated with the sharing of knowledge amongst stakeholders.

To better explain the fifth proposition, we can consider a situation where several stakeholders have valuable knowledge to contribute to the ES project. This study suggests the creation of a flexible project team by forming a core management team to oversee the project. The remaining stakeholders can be then roped in to the team only when their knowledge is required. For example, the end-users could be left out of the Project Preparation phase but brought in during the Business Blueprint phase, as their domain knowledge is required there.

To better explain the sixth proposition, we can look at the Business Blueprint phase. During this phase, there should be frequent exchanges between the end-users, internal IS staff and external parties during requirements gathering. To facilitate this, stakeholders can utilize various means of communication, such as e-mail and video-conferencing, as they may not always have time for formal meetings due to their other commitments, especially the external consultant who may not even be based in the organization. A document depository could also be used to hold updated versions of the blueprint as prepared by the IS staff and external parties. End-users can thus review these documents at their own pace.

Ultimately, the facilitation of an environment, in which stakeholders are willing and able to share their knowledge with other stakeholders to reach a mutual understanding (Reich & Benbasat 2000), could prove to be the most crucial factor contributing to the success of ES implementations. This is especially important in ES projects as knowledge domains are spread across different departments and stakeholders, both within and without the organization. Based on this argument, this study proposes the final proposition:

Proposition 7: Facilitating the knowledge sharing process among the stakeholders of ES implementations contributes to the success of the project.

6. Conclusion

In looking at knowledge sharing among the stakeholders of ES implementations, this study identified several issues which seem to indicate that organizations implementing ES have to

understand and utilize the knowledge of numerous internal and external stakeholders. To facilitate this, this study suggests the use of stakeholder theory.

This study offered a brief look at this theory and how it relates to knowledge sharing, particularly in the three areas of stakeholder analysis, namely stakeholder identification, stakeholder prioritization and stakeholder management. This study then presented seven propositions that suggest how stakeholder theory can be used to analyze knowledge sharing during ES projects, and open up new avenues for research into this area of study.

The next step is the application of this proposed stakeholder analysis model to actual cases of knowledge sharing during ES implementations; namely how to identify the relevant sources of knowledge within and without the organization, how these stakeholders could be prioritized based on their different domains of knowledge, and how to manage these stakeholders and their knowledge according to their different levels of priority.

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