
A Stakeholder Perspective of ES Implementation

A STAKEHOLDER PERSPECTIVE OF ENTERPRISE
SYSTEMS IMPLEMENTATION:
A CASE STUDY OF A UNIVERSITY'S ENTERPRISE
RESOURCE PLANNING PROJECT

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Executive Summary

Given the high rate of failure of Enterprise Systems (ES) projects (Sarker & Lee, 2003), ES surprisingly remain an under-researched area in IS (Rosemann & Watson, 2002). Studies that have explored ES per se have focused on common issues, such as measures of success, and lack of fit between organizational needs and system capabilities. In contrast, the study of the stakeholders of ES projects has not been adequately explored in IS practice (Papazafeiropoulou et al., 2002). The involvement of the large number of stakeholders, from within and without the organization in ES projects, though, seems to indicate the need for more in-depth studies on the perspectives of stakeholders and their inter-relationships (Pouloudi, 1999).

This study thus proposes the use of Stakeholder Theory as a lens through which to analyze the role and management of stakeholders of ES projects. In particular, this study begins with a review of literature on ES, to highlight the importance of stakeholders during ES projects, and on Stakeholder Theory, to showcase how it can facilitate the analysis of ES project stakeholders. Next, a case study of the first two phases of a university's ERP implementation was conducted. Based on this, several findings were identified with regards to the three components of the stakeholder analysis process of ES implementations; namely stakeholder identification, stakeholder prioritization, and stakeholder management.

For stakeholder identification, this study recognized the need for the identification of key activities in each phase of the ES project life cycle, followed by the identification of the stakeholders and their inter-relationships during each of these activities. This results in a comprehensive list of the relevant stakeholders during the ES project. For stakeholder prioritization, this study identified two legitimacy characteristics, two Level A sources of power and two level B sources of power, that facilitate the differentiation between the relevant stakeholders such that the more appropriate important stakeholders receive greater priority during each phase of the project. For stakeholder management, this study identified the need to form a well-balanced mix of the stakeholders involved in the project. This study also identified the need to facilitate an environment in which these stakeholders can enhance their inter-relationships and knowledge sharing.

Finally, this study concludes with a comprehensive stakeholder analysis model for the study of the stakeholders of ES implementations and some future areas for research. Consequently, this study hopes to contribute towards bridging the gap in the understanding of the stakeholders of ES projects.

Chapter 1

Introduction

1.1 Research Background

Enterprise Systems (ES), as a distinct phenomenon of interest, are an important yet under researched area in IS curricula (Klaus et al., 2000; Rosemann & Watson, 2002). This is surprising since the business world's embrace of ES may be the most important development in the corporate use of IS in the 1990s, despite the media attention given to the rise of the Internet (Davenport, 1998). This is especially so today, as ES have become the price of entry for running a business (Kumar & van Hillegersberg, 2000; Sarker & Lee, 2003) and the question for managers is no longer whether to implement ES but rather how to maximize such systems (Sousa, 2002).

The lack of studies on ES per se is all the more surprising when you realize that a significant proportion of ES projects fail (Sarker & Lee, 2003). At best, these failures result in huge losses for the organization, as in the case of 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).

ES are integrated enterprise-wide systems based on centralized databases. They are large, comprehensive and complex systems, involving large groups of people (Oliver & Romm, 2002; Rosemann & Watson, 2002). They are also expensive projects, not just in terms of money, with costs ranging from \$50 million to over \$500 million (Davenport, 1998; Pan et al., 2001), but also in terms of other investments, such as staff and time (Adam & O'Doherty, 2000; Lee et al., 2003; Poston & Grabski, 2000). It is thus perhaps not surprising for so many ES projects to turn out to be less successful than expected (Akkermans & Helden, 2002; Sarker & Lee, 2003).

Thus far, ES studies have primarily focused on common issues, such as measures of success, lack of fit between organizational needs and system capabilities, and systems integration. Studies on certain groups of stakeholders involved in ES implementations, such as users and IT staff, have also been advocated in recent literature (Pouloudi, 1999), but this has been on a small scale where each group is considered individually. In reality, ES projects involve many different groups of people, or stakeholders, from within and without the organization (Schneider, 2002). These stakeholders generally have key roles to play in ES projects and interact closely to fulfill those roles.

For example, the use of external third-parties to implement ES (Light, 2001) results not just in the involvement of new external stakeholders in the project, but also new inter-stakeholder relationships among these external stakeholders and traditional internal stakeholders, such as IS staff and employees. ES' ability to facilitate enterprise-wide integration also results in greater involvement in the project by the numerous

stakeholders from across the organization, thus resulting in a complex web of inter-stakeholder relationships. Such issues exemplify the diverse range of stakeholders who potentially are affected by or can impact on ES implementations. Logically, it thus appears that organizations should pay closer attention to these stakeholders and their needs. Instead, their importance, different viewpoints and ability to make things happen has been undermined in much of IS practice (Papazafeiropoulou et al., 2002).

This study posits that an in-depth study of the relevant stakeholders of ES implementations will provide greater insight into the impact they can have on the project and each other, and hence, how they should best be managed to maximize their contributions. This study proposes Stakeholder Theory as a lens to look at the stakeholders involved in ES implementations.

Stakeholder Theory focuses on the people factor instead of the technical factors of ES projects and looks at who (or what) are the stakeholders of an organization, and whom (or what) should organizations pay attention to (Freeman, 1984). It also advocates the study of the more important, and yet under-researched, issue of how the organization should deal with stakeholders who vary in importance (Jawahar & McLaughlin, 2001).

Although such an in-depth exploration of the perspectives of stakeholders and their inter-relations seems obvious (Pouloudi, 1999), there has been little systematic application of stakeholder analysis concepts, particularly in the context of ES implementations. This study aims to help to bridge this gap in ES implementation literature through a

qualitative, interpretive case study of the first two phases of a university's ERP project from a stakeholder perspective. Data from this case study was then analyzed to identify key findings about the impact of stakeholders during ES projects.

1.2 Research Questions

To facilitate this study, three research questions were raised. They revolve around the application of stakeholder theory to the study of ES implementation.

1. How can the stakeholders of an ES implementation be identified?
2. How can the important stakeholders of an ES implementation be differentiated?
3. How can the different stakeholders be managed?

The first question focuses on the identification of the relevant stakeholders involved in ES implementations, out of the entire gamut of stakeholders associated with the organization. The second question addresses the issue of who among these stakeholders are more important and deserving of attention. Finally, the last question considers how, given the different levels of importance of its stakeholders, organizations should manage them during the course of ES implementations.

1.3 Expected Contributions

The contributions of this thesis are expected to be relevant to both researchers and practitioners. To researchers, the findings should help to bridge the gap in ES implementation literature and give some insight into ES implementation from the project stakeholders' perspective, thus serving as a launch pad for further studies in this area.

As for practitioners, the findings should highlight the practical importance of better understanding of the role of stakeholders and management of the stakeholders involved in ES projects. Given the high failure rate of ES projects, practitioners need better solutions on how to tackle these projects. The work done in this study can thus potentially help them to see the value of stakeholder management to the success of ES projects.

1.4 Organization of Thesis

This thesis consists of six chapters, starting with this introduction chapter. The next chapter presents a literature review on two topics. The first topic is Enterprise Systems; their key features, the different stakeholders involved in ES projects, and their project life cycle. The second topic is Stakeholder Theory; how stakeholders are defined, several key issues, and some sample theories.

Chapter three presents the research methodology used in this thesis, how it was selected, how the case was identified, and how the data from the study was collected and analyzed. Chapter four describes the details of the case, while chapter five presents the findings from the case. The study concludes in chapter six with a summary of the study, research contributions, areas for future research, and limitations of this study.

Chapter 2

Literature Review

2.1 Enterprise Systems

2.1.1 Introduction to Enterprise Systems

Enterprise Systems evolved from Enterprise Resource Planning (ERP) systems, which were large, packaged application software that supported manufacturing organizations' needs for better materials and logistics management since the 1970s (Hayman, 2000; Klaus et al., 2000). 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).

Since then, Enterprise Systems has become an umbrella term not just for ERP systems but other types of enterprise-wide integrated systems as well. These include supply chain management, inventory control, manufacturing scheduling, sales support, customer relationship management, financial accounting, enterprise resource planning, human resources, and product life cycle management systems (Markus & Tanis, 2000; Sedera et al., 2003; Shang & Seddon, 2002). Generally, ES are defined as pre-packaged enterprise-wide systems that integrate various day-to-day operations into a single system with a shared database (Lee & Lee, 2000; Newell et al., 2003; Sedera et al., 2003).

The three popular types of ES are ERP, Customer Relationship Management (CRM), and Supply Chain Management (SCM) systems (Brown & Vessey, 2003; Shaw, 2000). ERP systems traditionally support recurring business processes like procurement and manufacturing, enable enterprise-wide management of resources, and are not focused on less structured and irregular processes like marketing and project management (Klaus et al., 2000; Shang & Seddon, 2002).

Throughout the 1980s and 1990s, ERP systems expanded beyond their original scope, as software entrepreneurs developed integrated software packages in which multiple functional applications shared a common database to meet organizational information-processing needs (Markus & Tanis, 2000). Simultaneously, traditional inventory control (IC) packages evolved into Materials Requirements Planning (MRP) Systems, and expanded to include other enterprise processes such as marketing, financial accounting, and human resource management (e.g. Baan) (Kumar & van Hillegersberg, 2000; Markus & Tanis, 2000). ERP systems are an amalgam of these different points of origin.

In the early 1980s, ERP systems were built on mainframe technology. In the late 1980s, they moved to minicomputers but their potential was still unrealized. Acceptance of ERP systems as a legitimate solution only emerged following the popularity of the client/server platform and development of cross-functional integrated ERP systems based on this architecture (Bennett & Timbrell, 2000; Markus & Tanis, 2000; Scott & Vessey, 2002). The growth of ERP systems is further expected to explode with the emergence of

new Web-based applications that provide levels of connectivity to rival the proprietary networks of large organizations (Bennett & Timbrell, 2000; Davenport, 2000).

CRM and SCM systems evolved from ERP systems (Kumar & van Hillegersberg, 2000). CRM systems help organizations optimize interactions with customers via one or more touch points to acquire, retain or cross-sell to customers (Goodhue et al., 2002) by incorporating traditional marketing-oriented functions, such as sales force automation and customer service software (Davenport, 2000). SCM systems help organizations build tighter collaborative networks of ERP systems with suppliers and buyers (Howard et al., 2003; Lee et al., 2003; Markus & Tanis, 2000) to ensure that the right products are delivered at the right time, at the right place, and at competitive prices (Shore, 2001).

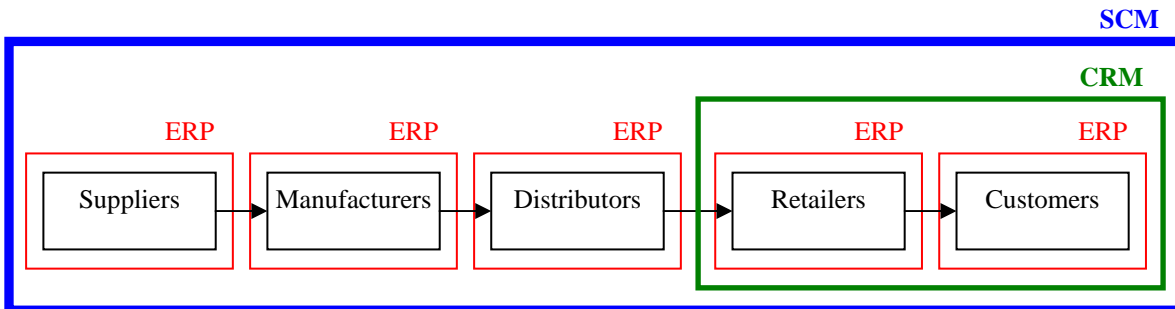


Figure 1: Types of Enterprise Systems

Ideally, ERP, CRM and SCM systems are coordinated, with ERP systems integrating back-office functions to serve as the backbone for the organization, CRM systems integrating marketing, sales and customer service interactions with customers, and SCM systems integrating processes among the organizations in the supply chain (see Figure 1).

Characteristic	Reference
Large, comprehensive systems	Oliver & Romm, 2002; Rosemann & Watson, 2002
Highly complex to implement and manage	Oliver & Romm, 2002; Rosemann & Watson, 2002
Involve large groups of people and resources	Akkermans & Helden, 2002
Expensive (monetary)	Davenport, 1998; Livermore & Ragowsky, 2002; Pan et al., 2001; Robey et al., 2002; Rodecker & Hess, 2001
Expensive (other investments, such as time, capital and staff)	Adam & O'Doherty, 2000; Lee et al., 2003; Poston & Grabski, 2000
Many project exceed initial deadlines	Kræmmergaard & Rose, 2002; Lorenzo, 2001; Murray & Coffin, 2001; Sprott, 2000
Many projects are less successful than intended	Akkermans & Helden, 2002; Parr & Shanks, 2000; Sarker & Lee, 2003

Table 1: Basic Characteristics of Enterprise Systems

ES have several basic characteristics (see Table 1). They 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). Many projects last from fourteen months to four years (Murray & Coffin, 2001), with most

exceeding their initial deadlines (Kræmmergaard & Rose, 2002; Lorenzo, 2001; Sprott, 2000). They are also expensive (Livermore & Ragowsky, 2002; Robey et al., 2002; Rodecker & Hess, 2001), with costs easily ranging from \$50 million to more than \$500 million (Davenport, 1998; Pan et al., 2001).

These high expenses are not limited to money, as significant investments also need to be made in terms of capital, staff and time (Adam & O'Doherty, 2000; Lee et al., 2003; Poston & Grabski, 2000). It is thus perhaps not surprising that many ES projects turn out to be less successful than intended (Akkermans & Helden, 2002; Sarker & Lee, 2003) due to these high risks of implementation (Parr & Shanks, 2000). Despite these risks, there is a booming market today for such enterprise-wide integrated software packages (Markus & Tanis, 2000) due to their potential to integrate organizational functions into a single system with a shared database.

2.1.2 Features of Enterprise Systems

As mentioned above, ES are large, complex and comprehensive enterprise-wide systems whose implementation involves various different stakeholders. Specifically, ES have five special characteristics that highlight the potential impact of stakeholders on ES implementations (see Table 2).

Firstly, ES projects' development and maintenance are usually outsourced (Light, 2001). Secondly, these outsourced systems often come with a pre-defined set of best practices (Davenport, 1998). Thirdly, ES facilitate integration, which has long been the holy grail

for organizations implementing IS (Kumar & van Hillegersberg, 2000). Fourthly, ES should be considered as ongoing concerns (Hirt & Swanson, 2001) due to their constantly evolving nature. Finally, ES are modular and flexible (Davenport, 2000). These characteristics and the importance of stakeholders in each case are described next.

Features	Details
Use of external vendors	<ul style="list-style-type: none">- A preferred option due to the size and complexity of ES.- ES need different sets of tasks, skills and expertise.- Shortage of skilled IS staff in organizations.- Exploit experienced external expertise to plug gaps in organizational capabilities.- Long-term relationship between external vendors and organization.
Best practices	<ul style="list-style-type: none">- ES come with their own in-built logic and best practices.- Organizations can change the system to suit their processes.- Organizations can change their process to suit the system.
Potential for integration	<ul style="list-style-type: none">- A core objective of organizations.- A complex process.- ES is particularly useful for coping with legacy systems.- ES integration can affect the entire organization.
Evolving nature of ES	<ul style="list-style-type: none">- Important to vendors<ul style="list-style-type: none">- Increase sales.- Easier to support several versions than various products.- Competitive market among vendors.

	<ul style="list-style-type: none">- Important to customers<ul style="list-style-type: none">- Keep systems updated.- Get added functionality.- To counter external pressures from value-chain partners.- Increased organizational dependence on vendors.
Modular and flexible	<ul style="list-style-type: none">- Use a component-based strategy to facilitate module development and implementation.- Organizations can be more flexible and agile in mixing and matching the modules implemented.- Offers a higher level of portability.- Facilitates integration among supply chain partners.

Table 2: Five Features of Enterprise Systems

2.1.2.1 Use of External Vendors

Organizations can develop ES in-house or purchase templates tailored for specific industries (Klaus et al., 2000; Markus & Tanis, 2000; Sasovova et al., 2001). Due to their size and complexity though, outsourcing development or purchasing pre-packaged systems is the preferred option (Reimers, 2003; Scheer & Habermann, 2000; Willcocks & Sykes, 2000).

Another reason for this trend is that ES implementations require a different set of tasks, skills and expertise from traditional in-house developed systems (Hirt & Swanson, 2001).

Thus, using external vendors facilitates the acquisition of experienced external expertise to plug this gap and expedite the organization's exploitation of ES to its fullest (Adam & O'Doherty, 2000; Nah et al., 2001; Sumner, 2000). This need for external expertise is compounded by the shortage of skilled IS staff in organizations (Klaus et al., 2000).

Despite this, the focus in recent years has still primarily been on other stakeholders, such as customers and end-users, as many have failed to foresee the rising importance of vendors and third parties (Hirt & Swanson, 2001). This is especially surprising as ES projects are not merely one-off things, but the start of long-term relationships between organizations and external vendors (Markus & Tanis, 2000). Furthermore, as ES grow more complex and comprehensive, organizational dependence on these external parties increase (Davenport, 2000; Nah et al., 2001).

Consequently, organizations must learn how best to manage their long-term relationships with external parties. In addition, external parties change the organizational landscape. For example, internal IS staff may now handle systems integration and support, rather than systems development. Organizations thus need to identify and manage the new roles and inter-relationships amongst their internal and external stakeholders.

2.1.2.2 Best Practices

Another unique characteristic of ES is that they 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). These

best practices could govern implementation methodologies (Knapp & Shin, 2001), data flow (Rodecker & Hess, 2001), or business process models (Kumar & van Hillegersberg, 2000; Lee & Lee, 2000).

Despite the idealistic view that there is one universal set of best practices (Murray & Coffin, 2001), these practices generally cater to specific classes of organizations (Nah et al., 2001), rather than all organizations. They are also vendor-defined and not customer-defined (Davenport, 1998). Despite that, they do offer benefits garnered from lessons learnt by past implementers, such as operational control, streamlined processes and just-in-time manufacturing (Hayman, 2000; Scott & Vessey, 2002).

The question then is whether the system fits organizational needs (Hong & Kim, 2002; Soh et al., 2000; Van Everdingen et al., 2000). If yes, are changes to the organization or system needed to support these best practices, and how should they be managed (Kræmmergaard & Rose, 2002; Murray & Coffin, 2001).

On the one hand, organizations can configure a generic system to meet their needs (Esteves & Pastor, 2001b; Rosemann & Watson, 2002) if they have unique core requirements (Light, 2001) or to increase differentiation from competitors (Kremers & van Dissel, 2000). However, it is difficult, costly and risky to modify the complex ES (Jones & Price, 2001; Lee & Lee, 2000; Sumner, 2000), and it could cause complications during future upgrades (Hong & Kim, 2002; Soh et al., 2000).

On the other hand, organizations can modify the organization via business process reengineering (BPR) to support these best practices (Adam & O'Doherty, 2000; Kremers & van Dissel, 2000; Rodecker & Hess, 2001). This too has consequences, as BPR can be rather tedious (Robey et al., 2002), especially to organizations whose business schemes cannot be reconciled to the standards required by the system (Lee et al., 2003).

In both cases, there is significant impact on organizational stakeholders. For example, in modifying the system, closer relationships may need to be fostered between the external parties and internal IS staff to facilitate knowledge transfer so the IS staff can subsequently handle system maintenance. Alternatively following BPR, organizations may need to redefine their internal inter-relationships with and between their staff whose roles could change, and who need to be convinced and trained to utilize the new systems.

2.1.2.3 Potential for Integration

Integration is a core objective for organizations implementing ES (Oliver & Romm, 2002; Singletary, 2002). The quest for integration has been the holy grail of IS since the 1950s but high levels of organizational and technical complexity have been major stumbling blocks, until the emergence of ES, which facilitate the unification of an organization's IS (Adam & O'Doherty, 2000; Kumar & van Hillegersberg, 2000; Singletary, 2002).

Even so, ES integration is still a complex process (Kræmmergaard & Rose, 2002; Sousa, 2002). It can involve the integration of modules, such as logistics and human resources

(Klaus et al., 2000; Sasovova et al., 2001), organizational functions (Knapp & Shin, 2001; Lee & Lee, 2000; Nah et al., 2001), or information across these functional units (Jones & Price, 2001; Murray & Coffin, 2001; Reimers, 2003). ES integration is particular useful for coping with legacy systems, which were custom-built and proliferated over the years into complex, disjointed and obsolete “islands of automation” (Brown & Vessey, 2003; McKenney & McFarlan, 1982; Tan & Pan, 2002).

In any case, ES integration can affect the entire organization (Reimers, 2003), especially given the single, centralized, enterprise-wide database to which all the ES applications are linked (Hirt & Swanson, 2001; Murphy & Simon, 2002; Stratman & Roth, 2002). Some ES even go beyond traditional organizational boundaries to facilitate integration along the inter-organizational supply chain (Davenport, 2000; Markus & Tanis, 2000).

ES projects have the potential to affect a number of organizational stakeholders within and without the organization. Thus, organizations need to cater to the needs of all these diverse stakeholders, while trying to fulfill the primary objectives of their owners. Organizations also need to work out ways of building closer inter-relationships between all the internal and external stakeholders to balance their contributions.

2.1.2.4 Evolving Nature of Enterprise Systems

Another characteristic of ES is that they are not static systems. They are always evolving to better meet organizational requirements, with new versions and upgrades regularly being made available (Brown & Vessey, 2003; Hirt & Swanson, 2001; Kumar & van

Hillegersberg, 2000). Organizations thus no longer ask “Should we upgrade?” but rather “When do we upgrade?” with the main reasons holding them back being financial or bad past experiences (Kremers & van Dissel, 2000).

These upgrades are important to vendors. They increase sales from increased functionality or bolt-on products (Kremers & van Dissel, 2000). Having a number of smaller software versions is also easier to support as compared to a large variety of products (Kremers & van Dissel, 2000). Regular upgrading is important to vendors too, to keep pace with their competitors and prevent them from penetrating their market base (Davenport, 2000).

Regular upgrades are important to organizations as they keep their systems updated (Kremers & van Dissel, 2000; Shang & Seddon, 2002), and help them avoid major conversion headaches as compared to if they skip a few versions (Markus & Tanis, 2000). The upgrades could also be implemented to acquire additional functionality or in response to pressure from value chain partners (Kremers & van Dissel, 2000).

These regular updates though, may not only disrupt organizations’ previous customizations (Kumar & van Hillegersberg, 2000; Murray & Coffin, 2001), they cause organizations to become increasingly dependent on their vendors for future assistance, updates and maintenance (Light, 2001; Oliver & Romm, 2002, Sumner, 2000). Consequently closer ties are needed between organizations and external parties so upgrades can be carried out in an efficient and timely manner.

2.1.2.5 Modular and Flexible

The fifth characteristic of ES is its modularity. The basic core ES is the rigid backbone into which disparate best of breed applications are plugged and played (Davenport, 2000; Sasovova et al., 2001). Vendors employ a component-based strategy based on object-oriented systems modeling to develop modules that can be independently adopted on top of the core ES (Murray & Coffin, 2001), such that their internal complexity is hidden from users who only have to understand the clearly defined interfaces (Kumar & van Hillegersberg, 2000; Sprott, 2000).

This feature is especially important in today's dynamic business environment, as organizations need to be flexible and agile to cope with rapid internal and external changes (Sprott, 2000; Stratman & Roth, 2002; Van Everdingen et al., 2000). ES thus enables organizations to more flexibly mix and match their ES modules to better suit their needs. ES also offer high levels of portability, which further enhances the organization's ability to flexibly adapt to changing requirements (Adam & O'Doherty, 2000). This also results in highly modularized organizations, each specialized in its core competency but always prepared to link up with its business partners' ES (Shaw, 2000).

Hence, ES projects again involve many stakeholders within and without the organization. This is because each new module has to be integrated with existing modules and should complement the modules of partner departments and organizations. Thus, the conditions that necessitate flexible systems also necessitate flexible stakeholder relationships.

2.1.2.6 Summary

In analyzing these five areas, it is clear that organizations who implement ES have to deal with various different stakeholders from within and without the company. Even their usual stakeholders, such as end-users and internal IS staff, are changing, as their roles, responsibilities and activities during ES implementations are different as compared to other IS projects. As such, organizations need to be able to identify and differentiate between the new roles of these stakeholders during ES projects and their subsequent levels of importance. From there, organizations need to identify ways of managing them to maximize their contributions during ES implementations.

2.1.3 ES Implementation Involve a Large Number of Stakeholders

As seen from the characteristics mentioned above, ES implementations have a wide range of impacts on the stakeholders involved. As part of the development and use of ES, the roles, responsibilities and inter-relationships of stakeholders are often redefined. Organizations thus need to keep abreast of their stakeholders and their interactions, so that they can better manage them accordingly. Furthermore, considering the wide scope and impact of ES throughout the organization, they typically require input from a host of different stakeholders from within and without the organization. Hence, organizations need to know how to identify the relevant stakeholders of such ES projects and find ways to meet their various interests.

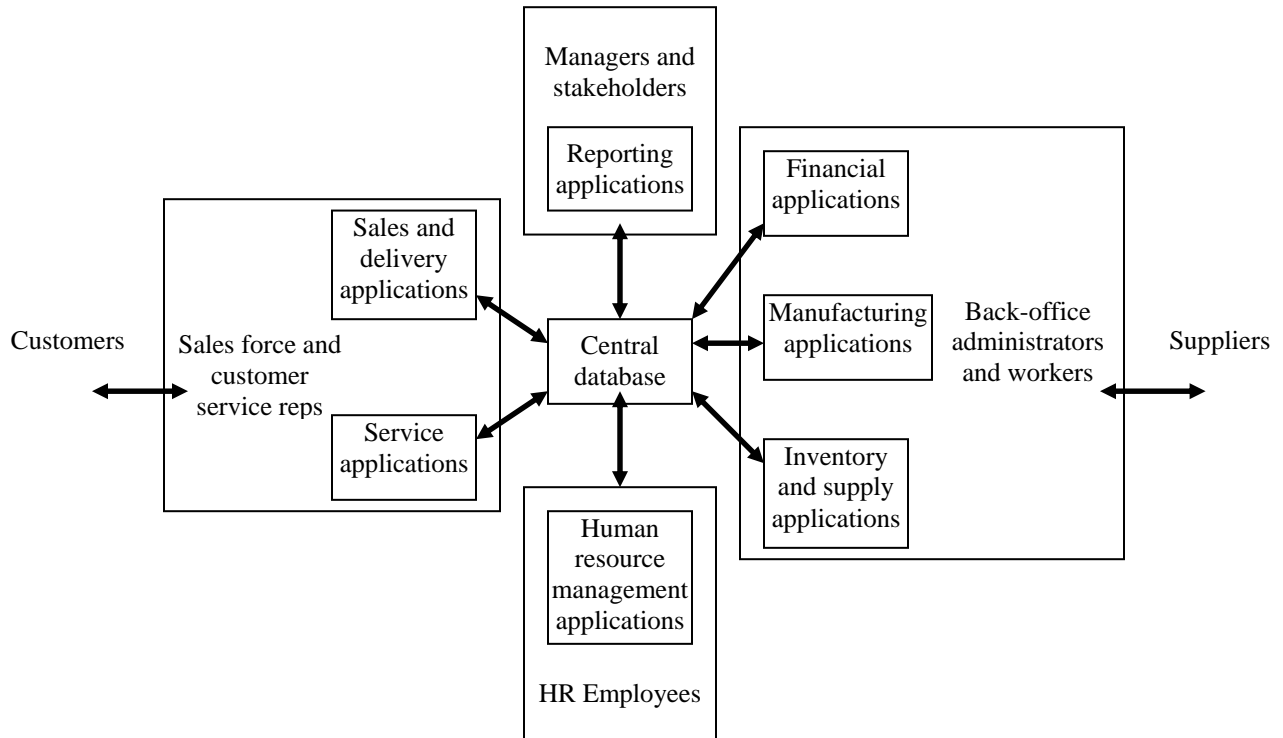


Figure 2: Anatomy of an Enterprise System (Davenport, 1998)

In a way, ES projects can be seen as socio-technical challenges where group dynamics and technological advancement continuously and mutually shape each other (Newell et al., 2002). There is thus a need to identify and understand these groups and their dynamics. Davenport (1998) initially attempted to identify the groups involved in ES (see Figure 2) and his list included top management, shareholders (which he termed as stakeholders), employees, customers and suppliers. Other researchers further explored the role of these stakeholders, and others, such as internal IS staff, third party vendors and end-users as a whole. In general though, the four main stakeholder categories of ES are management, end-users, IT staff and external parties (see Table 3).

Stakeholder	References
Management	Akkermans & Helden, 2002; Brown & Vessey, 2003; Davenport, 1998; Esteves & Pastor, 2001a; Kræmmergaard & Rose, 2002; Livermore & Ragowsky, 2002; Murray & Coffin, 2001; Reimers, 2003; Sarker & Lee, 2003; Stratman & Roth, 2002; Sumner, 2000
End-Users	Baskerville et al., 2000; Esteves & Pastor, 2001a; Esteves & Pastor, 2001b; Hirt & Swanson, 2001; Hong & Kim, 2002; Howard et al., 2003; Howcroft & Light, 2002; Klaus et al., 2000; Kræmmergaard & Rose, 2002; Lorenzo, 2001; Pan et al., 2001
Internal IS Staff	Baskerville et al., 2000; Hirt & Swanson, 2001
External Parties	Akkermans & Helden, 2002; Brown & Vessey, 2003; Markus et al., 2000a; Nah et al., 2001; Stratman & Roth, 2002; Volkoff & Sawyer, 2001

Table 3: The Main Stakeholders of ES Projects

The first key stakeholder category of ES projects is management. This includes the steering committee and project managers of the ES project. The active (Brown & Vessey, 2003; Davenport, 1998; Murray & Coffin, 2001), strong and committed (Livermore &

Ragowsky, 2002; Sarker & Lee, 2003) support of management is important to the project. Such support signals the importance of the system and shows management's backing of the project (Akkermans & Helden, 2002; Reimers, 2003), which is crucial given its complexity and comprehensive, enterprise-wide nature.

Their support helps to build acceptance and confidence in the system among the rest of the organizational stakeholders, to get them to contribute more effectively to the project. Such support needs to be evident throughout the project, from the start to roll it out, in the middle to keep it on track, and at the end to encourage its utilization (Esteves & Pastor, 2001a). In particular, the project should be supported by a project champion who oversees the project's progress and allocates the resources required for successful implementation (Esteves & Psator, 2001a; Stratman & Roth, 2002; Sumner, 2000). This person needs sufficient strength and authority over the stakeholders (Sarker & Lee, 2003) to energize them to work (Kræmmergaard & Rose, 2002).

The second major stakeholder category of ES projects is the end-users. This includes internal staff and external customers. End-users are important as they possess the necessary know-how of the relevant business processes, which needs to be accurately mapped to the system's configurations (Esteves & Pastor, 2001a; 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 (Esteves & Pastor, 2001b; Kræmmergaard & Rose, 2002; Pan et al., 2001).

Increasing the involvement of end-users also minimizes their resistance to changes in job content and uncertainty in the new system (Hong & Kim, 2002). The end-users of ES also require extensive training (Lorenzo, 2001) to learn a wider range of skills to effectively handle the system, and interact with internal IS staff and external vendors (Baskerville et al., 2000; Howcroft & Light, 2002). One particularly important group of end-users is the organization's customers, as they are no longer passive recipients of products and services. Instead, they have become increasingly discerning, demanding (Klaus et al., 2000), price conscious and impatient with regards to what they want (Howard et al., 2003).

The third important stakeholder category of ES projects is the internal IS staff. This includes both permanent and contract IS staff in the organization handling the system's technical implementation. As ES are generally developed by external parties, their role is significantly different during ES projects (Hirt & Swanson, 2001). They no longer design and build the actual system. Instead, they require skills that are oriented towards combining "package" knowledge and business knowledge (Baskerville et al., 2000). They also help the external parties to gather end-user feedback to facilitate the system's configuration and its integration with existing organizational systems.

The final important stakeholder category is the external parties. This includes third-party vendors, who develop the ES, and external consultants. Where previously, organizations would not contemplate delegating a project as important as an ES implementation to an outside party, today, they have to do so as they lack the necessary skills to handle it

themselves (Akkermans & Helden, 2002). Third-party vendors thus help to develop the systems software but are otherwise normally not involved in the ensuing implementation (Volkoff & Sawyer, 2001).

External consultants then help to fill any gaps in expertise, product knowledge, process guidance and IT skills (Brown & Vessey, 2003; Stratman & Roth, 2002; Volkoff & Sawyer, 2001) during the implementation process. 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 efforts is, to put it mildly, a challenge (Markus et al., 2000).

For an ES project to be successful, representatives of each of these categories should be involved, and the strengths of each group maximized. However, as it is unlikely that a homogeneous category has all the relevant knowledge and expertise to implement ES (Newell et al., 2002), the mix of representatives should be well-balanced to ensure a good combination of knowledge, skills and experience (Sarker & Lee, 2003; Staehr et al., 2002; Willcocks & Sykes, 2000). Both internal and external personnel should be included to enable internal staff to “grow” the necessary skills for ES projects (Sumner, 2000).

This leads to three questions. Firstly, given the project’s needs and the numerous stakeholders in organizations, who should be included in these projects? Secondly, as the project involves various stakeholders with their own needs and responsibilities, which of them are more important and deserving of attention? Finally, given their different levels

of importance and the need to cater to as many of their interests as possible, how can these different stakeholders be simultaneously managed?

2.1.4 Enterprise Systems Life Cycle

The identification and management of the relevant stakeholders of ES projects, though seemingly straightforward on the surface, is actually rather complex as ES implementations are not static processes. They iteratively traverse several phases, each of which is characterized by its own key players, activities, problems, metrics and outcomes (Chang et al., 2000; Markus & Tanis, 2000; Newell et al., 2002). In particular, stakeholders, and their roles and interactions, vary according to the phase in which they are in (Pouloudi, 1999) (see Table 4).

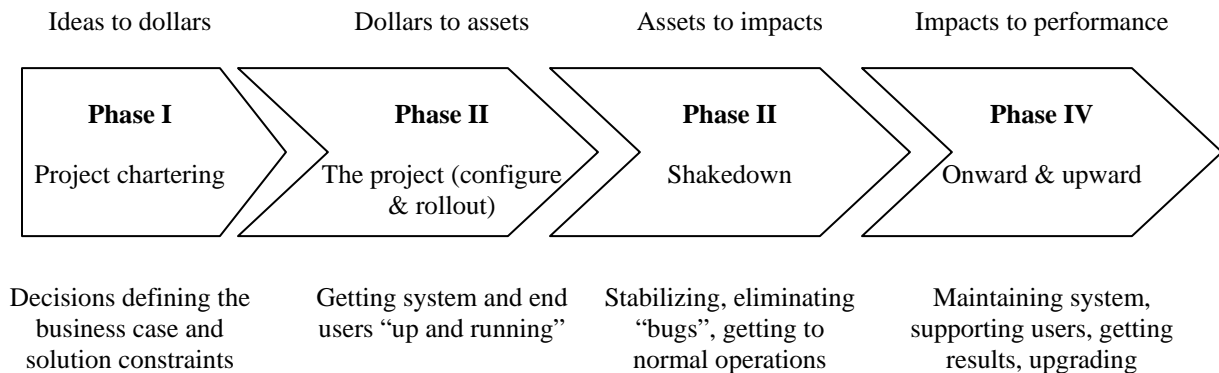


Figure 3: Enterprise Systems Life Cycle (Markus & Tanis, 2000)

A widely referenced theoretical ES life cycle model was developed by Markus & Tanis (2000) (see Figure 3) and consists of four phases, each with its' own players and activities (see Table 4). First is the Project Chartering, or planning, phase (Staehr et al.,

2002). Next is the Project phase, which involves the software configuration and roll-out (Markus et al., 2000; Staehr et al., 2002). Third is the Shakedown phase from when the system goes live to when normal operations are achieved (Staehr et al., 2002), after which the project team either continues to handle the project or passes control to the operational managers or end users. Finally, the Onward and Upward phase lasts until the system is upgraded or replaced, which can take up to four years (Staehr et al., 2002).

Phases	Key Players/Stakeholders	Key Activities
Project chartering	<ul style="list-style-type: none"> • Vendors • Consultants • Company executives • IT specialists 	<ul style="list-style-type: none"> • Building a business case for enterprise systems • Selecting a software package (though this decision may be deferred until the project phase) • Identifying a project manager • Approving a budget and schedule
The project	<ul style="list-style-type: none"> • Project manager • Project team members (often non-technical members of various business units and functional areas) • Internal IT specialists • Vendors • Consultants 	<ul style="list-style-type: none"> • Software configuration • System integration • Testing • Data conversion • Training • Rollout

Shakedown	<ul style="list-style-type: none"> • Project manager • Project team members (often non-technical members of various business units and functional areas) • Operational managers • End users • IT support personnel (internal or external) 	<ul style="list-style-type: none"> • Bug fixing and rework • System performance tuning • Retraining • Staffing up to handle temporary inefficiencies
Onward & upward	<ul style="list-style-type: none"> • Operational managers • End users • IT support personnel (internal or external) • Vendor personnel and consultants may also be involved, particularly when deliberations about upgrades are concerned. 	<ul style="list-style-type: none"> • Continuous business improvement • Additional user skill building • Post-implementation benefit assessment

Table 4: ES Life Cycle’s Key Players and Activities (Markus & Tanis, 2000)

A more practical ES model employed by organizations implementing SAP software is SAP’s Accelerated SAP (ASAP) methodology (ASAP Roadmap; SAPFile) (see Figure

4). ASAP combines methodologies, tools, templates and best practices to streamline implementations, covering a broad spectrum of functionality, and allowing for modifications to the software to meet specific organizational requirements.

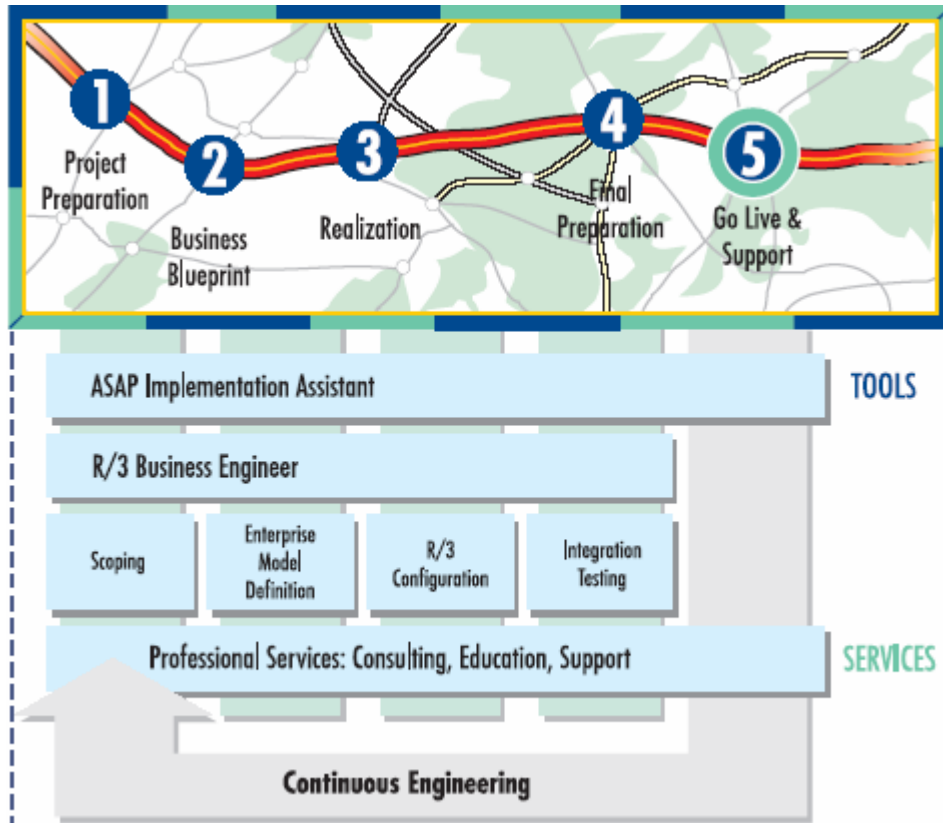


Figure 4: Accelerated SAP (ASAP) Roadmap

This methodology consists of five phases. During the Project Preparation phase, the project team is finalized, the need for additional hardware is reviewed, and the high-level project plan is completed. During the Business Blueprint phase, a blueprint is developed to understand the organization’s business goals and determine the business processes to support these goals, and the 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 their 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, creates a Go-Live strategy, and gets approval for the system to go live. Finally, in the Go-Live and Support phase, the system is reviewed and refined by the organization to ensure that the business environment is fully supported. As the relationship between the organization and vendor usually only lasts until the system has stabilized, there is no post-implementation phase.

This study finds that by themselves, both models are insufficient for a detailed stakeholder analysis of ES implementations. The Markus & Tanis (2000) theoretical model does not clearly differentiate between the activities involved in its Project phase, while the ASAP model lacks a final Post-Implementation phase. This study thus proposes combining the two into a six-step ES project life cycle model (see Table 5), which better defines the phases of an ES project. Each phase has its' own key activities and relevant stakeholders, which are studied further in the subsequent case.

In particular, this study focuses on the first two phases of the project. It is felt that these phases are particularly important as they serve as the foundation upon which the rest of the project is based on. Furthermore, there is a need to study two phases instead of just a single phase, as the stakeholder activities, contributions and relationships in each phase

vary. Thus, the study of two phases provides a more comprehensive look at the differences that exist between the stakeholders in distinct phases of the ES project.

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 and Support phase
Post-Implementation phase	-	Post-Implementation phase

Table 5: Six-Step ES Project Life Cycle Model

2.2 Stakeholder Theory

Having identified the main stakeholder categories of ES projects and why they are important to the success of these projects, the next step is to analyze the contributions and interactions of these stakeholders in greater detail. This is necessary for the organization to effectively manage these stakeholders. To facilitate such an analysis, this study proposes the use of Stakeholder Theory.

2.2.1 Definition of Stakeholders

Stakeholder Theory views an organization as a system of stakeholders. In Stakeholder Theory, a stakeholder can be defined in a number of ways. The most popular definition is by Freeman (1984) who defined a stakeholder as any group or individual who can affect or be affected by the achievement of an organization's purpose (Chan et al., 2003; Starik, 1994). Even if no claim is made, no interest expressed, no right asserted, there may still be some "stakeholding" between any two entities (Starik, 1994). This definition though, only considers stakeholders from the perspective of the organization under study (Friedman & Miles, 2002; Pouloudi, 1999).

Alternatively, stakeholders can be defined as persons or groups that have, or claim ownership, rights or interests in a corporation and its activities, past, present or future (Clarkson, 1995). These interests or stakes could be because the stakeholder was affected by the firm's behavior (Rowley & Moldoveanu, 2003), was involved in the actual development, operation and use of the system (Mendelow, 1984), or has a stake in the organization's decisions (Pouloudi, 1999). Ultimately, stakeholders can have multiple kinds of stakes in a system (Adelakun & Jennex, 2002) and those with similar interests, claims or rights can be classified as belonging to the same group (Clarkson, 1995).

Stakeholders may be classified as primary or secondary (Clarkson, 1995; Mitchell et al., 1997; Schneiderman & Rose, 1996). Primary stakeholders interact directly with the system and without whose participation, the organization cannot survive. Secondary stakeholders interact indirectly with the system and are not essential for its survival.

Stakeholders could be internal or external groups, depending on whether they originate from inside or outside the organization (Adelakun & Jennex, 2002; Pouloudi, 1999; Schneider, 2002). They could be owners or non-owners, voluntary or involuntary actors, resource providers or dependents, or risk-takers or influencers (Mitchell et al., 1997). Finally, a stakeholder can be classified as an individual, group of individuals, subset of an identifiable group of individuals, organization, institution, society or even the natural environment (Jones, 1995; Mitchell et al., 1997; Scott & Lane, 2000).

Common stakeholders identified by Stakeholder Theory studies include customers, employees, suppliers, competitors, shareholders and government agencies (Adelakun & Jennex, 2002; Greenley & Foxall, 1998). Other stakeholders identified include board members (Schneider, 2002; Scott & Lane, 2000), top management (Clarkson, 1995), IT staff (Ruohonen, 1991), third-party vendors and consultants (Hirt & Swanson, 2001), and the general community (Berman et al., 1999; Boatright, 2002).

The definition of stakeholders used in this study is based on the basic definition by Freeman (1984). The stakeholders of ES implementations are thus any group or individual who can affect or be affected by the project.

2.2.2 Several Key Stakeholder Theory Issues

As mentioned in section 1.1, Stakeholder Theory refocuses our attention on people and the organization (Coakes & Elliman, 1999). Although several researchers have studied stakeholders, such studies generally focus on one or two stakeholders in isolation of the

rest. Stakeholder Theory though, proposes that an organization should be seen as a system of stakeholders, and its objective should be the study and promotion of all their interests without favoring one group over others (Boatright, 2002; Clarkson, 1995).

According to Stakeholder Theory, each stakeholder is different. For example, they have different frames of reference in assessing ES project success (Kræmmergaard & Rose, 2002; Sasovova et al., 2001; Singletary, 2002), which can result in conflicting interests and incompatible requirements (Hong & Kim, 2002; Soh et al., 2000). Stakeholders also differ with respect to their importance to the organization (Adelakun & Jennex, 2002; Jawahar & McLaughlin, 2001).

Social perception theory dictates that such differences inevitably exist (Klein & Jiang, 2001) and could be in the form of different perspectives, purposes or units of measurement (Donaldson & Preston, 1995; Massey et al., 2001; Seddon et al., 1998). On the plus side, this could result in diverse and rich accounts of the context (Pouloudi, 1999) while on the down side, it could lead to complex and at time conflicting interests (Chan et al., 2003; Collins, 1994; Massey et al., 2001).

Consequently, stakeholders generally act first and foremost to protect their own interests. Such stakeholder activism has become a common occurrence in corporate life and a genuine managerial issue, as groups such as environmentalists and human rights organizations utilize various strategies to try and influence firms' actions to promote their

interests (Rowley & Moldoveanu, 2003). Hence it is important that organizations identify and manage all their different stakeholders and their interests.

One particular gap in the literature on stakeholders has been a lack of appreciation of the scope of stakeholder relationships (Friedman & Miles, 2002). These relationships are not limited one-to-one interactions but are a complex array of multiple interdependent relationships that exist in stakeholder environments (Howard et al., 2003; Pouloudi, 1999; Rowley, 1997). Since each stakeholder has some form of investment in the organization or system, they should all be entitled to a share of the value it generates (Kochan & Rubinstein, 2000).

Organizations should thus not limit their focus to any one group but should give all groups the opportunity to participate and benefit from the system to increase their satisfaction with it (Pouloudi, 1999; Schneiderman & Rose, 1996). Additionally, since how each stakeholder reacts to a situation is based on his interaction with multiple influences from the entire stakeholder set (Nambisan & Agarwal, 1998; Rowley, 1997; Rowley & Moldoveanu, 2003), the interests of that stakeholder group cannot be considered in isolation of other groups since they are all inevitably linked (Greenley & Foxall, 1998; Massey et al., 2001; Pouloudi, 1999). In fact, aligning them on what the project is about can enhance the project's possibility of success (Akkermans & Helden, 2002; Hartman & Ashrafi, 2002).

Identification of the relevant stakeholders leads to a better understanding and more efficient management of the complex inter-stakeholder web. This has various benefits, such as the consideration of organizational and political issues, which have often been identified as the main culprits of project failures, from multiple perspectives (Pouloudi, 1999). In fact, success in satisfying these multiple interests, rather than meeting conventional economic and financial criteria, may constitute the ultimate test of corporate performance (Adelakun & Jennex, 2002), as it allows the organization to more closely align its corporate priorities and actions with stakeholder needs (Wolfe & Putler, 2002).

Stakeholders though, are not fixed. They vary depending on the time and context (Pouloudi, 1999). Organizations thus need to analyze how and why such variances occur, as this impacts on who the key stakeholders at a given time are. One possibility identified in past research is that these changes could be due to the different situations that stakeholders are in (Wartick, 1994). For example, different stakeholders become critical to the organization at different stages of the project life cycle (Adelakun & Jennex, 2002; Jawahar & McLaughlin, 2001).

As these changes can occur for any number of reasons, in any number of directions (Friedman & Miles, 2002), the question is no longer just when to involve different stakeholders, but more importantly, how to utilize them (Scott & Wagner, 2003). Again, such analysis is only possible based on a comprehensive identification of all the relevant stakeholders and their levels of contribution. This can then facilitate a variable management process to cater to these stakeholder changes.

In short, according to Stakeholder Theory, stakeholders have three characteristics that need to be addressed during stakeholder analysis. Firstly, they are different so organizations need to identify their individual characteristics and interests. Secondly, they exist in a complex web of inter-relationships so organizations need to understand and manage their complex interactions. Finally, stakeholders, their contributions, interests, relationships, and so on are variable at each phase of a project life cycle.

Hence, to facilitate greater understanding of stakeholders, it is important for organizations to first correctly identify the relevant stakeholders in the organization (Adelakun & Jennex, 2002), and understand their perceived stakes in the system (Rowley & Moldoveanu, 2003), the types of influence they can exert (Rowley, 1997), and how they will act in different circumstances (Frooman, 1999). Prioritization of these stakeholders further helps organizations to focus on their more important stakeholders first before fulfilling their other responsibilities (Jawahar & McLaughlin, 2001; Starik, 1994; Wolfe & Putler, 2002). Finally, there is a need to understand how organizations respond to the influences exerted by stakeholders (Rowley, 1997), and how they manage these stakeholders.

2.2.3 Sample Stakeholder Theories

Several theories abound concerning stakeholder analysis of organizations, with the most basic one being Freeman (1984)'s "The Principle of Who or What Really Counts". It considers two questions; "Who (or what) are the stakeholders of the firm", and "To

whom (or what) do managers pay attention” (Mitchell et al., 1997). This theory is rather simplistic though, as it does not explain how stakeholders are identified or prioritized, or how to handle stakeholders once they have been identified.

This is a prevalent trend in Stakeholder Theories. The theories agree that the starting point of stakeholder analysis is the identification of stakeholder groups and their interests, and an evaluation of their level of importance (Frooman, 1999; Wolfe & Putler, 2002) but otherwise fail to actually explain how this can be done, or how the stakeholders should subsequently be handled.

		Is the stakeholder dependent on the firm?	
		No	Yes
Is the firm dependent on the stakeholder?	No	Indirect / Withholding	Indirect / Usage
	Yes	Direct / Withholding	Direct / Usage

Figure 5: Typology of Influence Strategies (Frooman, 1999)

For example, Frooman (1999)’s Typology of Influence Strategies considers three questions about stakeholders: Who are they?; What do they want?; How are they going to get it? His model goes on to look at the third question, and highlights two types of resource control strategies: a withholding strategy, where they discontinue providing a

resource, and a usage strategy, where they continue to supply a resource but with strings attached. It also shows two types of influence pathways, a direct strategy, where they manipulate the resource flow, and an indirect strategy, where they work through an ally to manipulate the resource flow (see Figure 5). However, although this theory describes how stakeholders can affect organizations, again, it does not describe how such stakeholders are identified and prioritized, or how they should subsequently be handled.

Mitchell et al. (1997), attempted to bridge this gap with a descriptive stakeholder theory model. The authors felt that classes of stakeholder can be identified by their possession or attributed possession of one, two or all three of the following attributes:

1. The stakeholder's power to influence the organization.
2. The legitimacy of the stakeholder's relationship with the organization.
3. The urgency of the stakeholder's claim on the organization.

Power here is defined as a relation among social actors, where actor, A, can get another actor, B, to do something that B would not otherwise have done (Agle et al., 1999; Mitchell et al., 1997). Legitimacy is defined as a generalized perception or assumption that the actions of a stakeholder are desirable, proper or appropriate within some socially acceptable and expected set of norms, values, beliefs and definitions (Agle et al., 1999; Mitchell et al., 1997). The attribute of urgency moves the model from static to dynamic (Mitchell et al., 1997). They defined urgency as a multidimensional notion based on time-sensitivity, or degree to which managers delay in attending to the stakeholder, and

criticality, or importance of the claim to the stakeholder (Agle et al., 1999; Mitchell et al., 1997; Rowley & Moldoveanu, 2003).

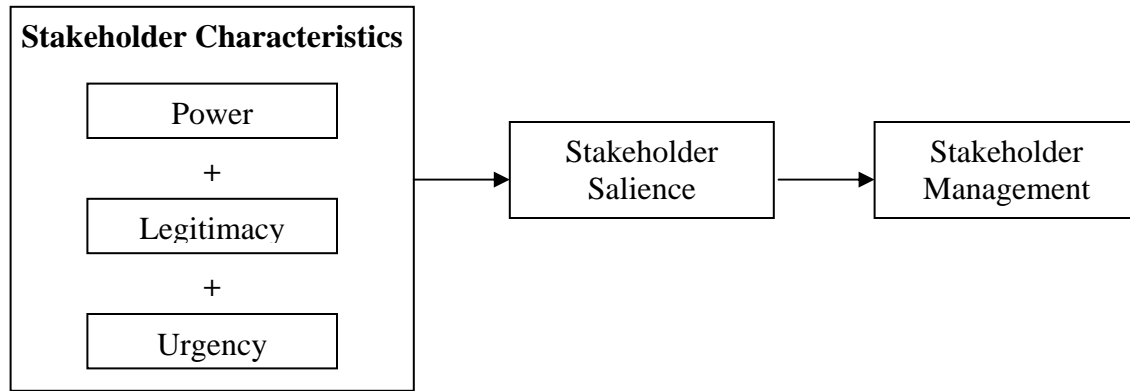


Figure 6: A Stakeholder Theory Model (Mitchell et al., 1997)

These attributes collectively contribute to stakeholder salience, or importance, which is the degree to which managers give priority to competing stakeholder claims, and affects how they manage these stakeholders (Agle et al., 1999) (see Figure 6). In addition, the authors claim that these attributes are variable, and can change for any particular stakeholder relationship, and the existence or degree present of each attribute is a matter of multiple perceptions and is a constructed reality rather than an objective one. Finally, they claim that a stakeholder may or may not be conscious of possessing the attribute, and if conscious of it, may not choose to act on it.

In another example, the Extended Relational Foundations (ERF) model (Hirt & Swanson, 2001), covers four entities, namely IS staff, users, application systems and external parties, and the inter- and intra-relationships between them (see Figure 7). This model

highlights two key issues of the stakeholder analysis process. Firstly, stakeholders that are both internal and external to the organization, and their relationships, should be considered. Secondly, in addition to studying the inter-relationships between stakeholders, the interactions amongst the members of stakeholder groups should also be studied. It should however be noted that the stakeholders considered in this model are not limited to human actors. Furthermore, the four entities considered are insufficient, as important groups such as top management, are not included. Finally, this model does not detail exactly how these stakeholders should be identified, prioritized or handled.

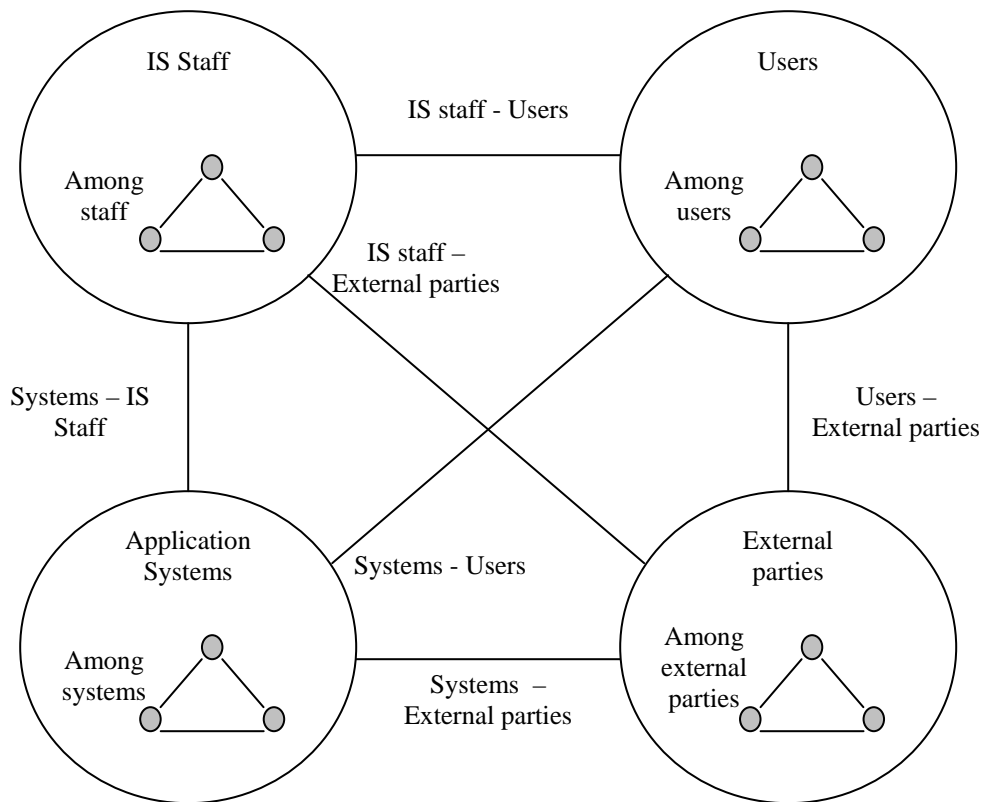


Figure 7: Extended Relational Foundations (ERF) Model (Hirt & Swanson, 2001)

Below is a summary of the stakeholder analysis models mentioned above, and their strengths and weaknesses (see Table 6). From this summary, this study posits that an in-depth stakeholder analysis of ES implementations should include the following:

1. A look at how the relevant stakeholders of a project can be identified.
2. A look at how the stakeholders of a project can be prioritized.
3. A look at how the stakeholders of a project should be managed.
4. A look at the dynamics of inter-stakeholder relationships.

Model / Theory	Strengths	Weaknesses
Freeman (1984)'s "The Principle of Who or What Really Counts"	<ul style="list-style-type: none"> - It looks at who the stakeholders are. - It looks at who managers should pay attention to. 	<ul style="list-style-type: none"> - It does not cover how to identify and prioritize stakeholders. - It does not identify how to handle stakeholders.
Frooman (1999)'s Typology of Influence Strategies	<ul style="list-style-type: none"> - It looks at who the stakeholders are. - It looks at what these stakeholders want. - It looks at how they get what they want. 	<ul style="list-style-type: none"> - It does not cover how to identify and prioritize stakeholders. - It does not identify how to handle stakeholders.
Mitchell et al. (1997)'s Model	<ul style="list-style-type: none"> - It covers how to identify and prioritize stakeholders. - It identifies how these 	<ul style="list-style-type: none"> - It does not actually identify the stakeholders who are salient.

	<ul style="list-style-type: none"> attributes affect the salience of a stakeholder. - It covers how stakeholder salience affects how they are subsequently handled. 	<ul style="list-style-type: none"> - It does not identify how to handle stakeholders. - It does not take into account the dynamics of stakeholder relationships.
Hirt & Swanson (2001)'s Extended Relational Foundations (ERF) model	<ul style="list-style-type: none"> - It highlights the need to consider both internal and external stakeholders. - It highlights the need to consider stakeholder inter- and intra-relationships. 	<ul style="list-style-type: none"> - It is not focused on human stakeholders. - The list of stakeholders considered is incomplete. - It does not cover how to identify and prioritize stakeholders. - It does not identify how to handle stakeholders.

Table 6: Strengths and Weaknesses of Sample Stakeholder Theories

2.3 A Stakeholder Perspective of Enterprise Systems Implementations

Having considered various issues surrounding Enterprise Systems and Stakeholder Theory, this study now applies this theory in the context of ES. The first step in analyzing the stakeholders involved in ES projects is to define who qualifies as a stakeholder. The definition of stakeholders used in this study is based on the basic definition offered by

Freeman (1984). Thus, the stakeholders of ES implementations are any group or individual who can affect or be affected by the project.

As mentioned in section 2.1.3, this covers four categories, namely top management, end-users, IS staff and external parties. However, this is insufficient as each category is rather broad and there could be several groups within each of them. For example, the top management group could consist of the project managers and project steering committee. So, each distinct stakeholder group within each category should also be identified.

Next, a study involving a stakeholder perspective of ES should address the three key Stakeholder Theory issues highlighted in section 2.2.2. Firstly, stakeholders are different. In the case of ES implementations this is evident in the different skills needed during the course of the project. Since it is unlikely for any one person to have all the necessary skills and expertise, different stakeholders are required. For example, external consultants are required to share their expertise about systems implementation, while end-users provide the necessary business knowledge on the processes that the system will support. Each stakeholder thus contributes to the project in a different way and has his own interests. Hence, organizations need to identify the different interests of these stakeholders and see how best to fulfill all their needs.

Secondly, stakeholders exist in a complex web of inter-relationships. Past literature on ES implementations has focused on specific stakeholders in isolation of the rest. In reality, during the course of ES projects, these stakeholders do not work independently. Instead,

they work closely with varying levels of interaction to maximize their contributions. For example, end-users do not just supply business requirements. They also work closely with IS staff to see which requirements can be supported by the system and which ones require alternative solutions. Consequently, a stakeholder's actions during the project are likely to be influenced by these stakeholders. Organizations therefore need to identify the levels of interaction among their stakeholders. From there, they should manage all relevant stakeholders simultaneously.

Finally, stakeholders are dynamic in different situations. In section 2.1.4, it was shown that ES projects comprise of different phases, each with its own key activities (Markus & Tanis, 2000). Each activity places different demands on the ES project team, especially with regards to the skill sets required to carry out the activity. Logically, it follows that the combination of stakeholders and their levels of contribution required to support each activity varies as well. Organizations thus need to identify the different key activities in each phase of the ES life cycle, the stakeholders involved in each activity, and the levels of interaction between them. This allows each stakeholder to be appropriately managed in each phase of the ES project.

This study adopts Mitchell et al. (1997)'s model to analyze the stakeholders involved in ES projects in the following case study, as it provides a starting point in describing the stakeholder analysis process. This model though, is limited when applied to ES implementations. Firstly, it is incomplete, as it only describes the attributes that contribute to stakeholder salience without specifically going on to identify the

stakeholders who are salient (Jawahar & McLaughlin, 2001). Furthermore, although these attributes may be useful in differentiating between a given set of stakeholders, there should be an additional step prior to this model to first identify this set of stakeholders. Secondly, the attributes may be too simplistic for an analysis of the stakeholders of an ES project, as there could be a number of sources of the attributes involved. Finally, although this model proposes that stakeholder salience affects the way stakeholders are managed, it does not actually describe how the organization should handle its stakeholders who have different levels of importance during the course of the ES project.

A primary aim of this study is to build on Mitchell et al., (1997)'s model. This study thus looks to utilize this model for a stakeholder analysis of ES implementations by building on it and expanding on how stakeholder can be identified, prioritized and managed. To do so, this study looks at three research questions:

1. How can the stakeholders of an ES implementation be identified?
 - This question helps to identify the process by which all the relevant stakeholders involved in an ES project can be spotted.
2. How can the important stakeholders of an ES implementation be differentiated?
 - This question helps to identify the characteristics that can be used to distinguish between the stakeholders identified.
3. How can the different stakeholders be managed?
 - This question helps to identify the key issues that need to be addressed in facilitating the handling of these different stakeholders.

Chapter 3

Research Methodology

3.1 Methodology Selection

3.1.1 Qualitative versus Quantitative Research

A common distinction among research strategies in IS, is between qualitative and quantitative research methods (Myers, 1997). Quantitative research methods were originally developed in the natural sciences to study natural phenomena, while qualitative methods were developed in the social sciences to study social and cultural phenomena (Myers, 1997).

Basis of Comparison	Qualitative Research	Quantitative Research	References
Origin	Based on social sciences	Based on natural sciences	Myers, 1997
Type of research	Subjective	Objective	Lee, 1991; Lee, 1992
Focus of research	Description	Statistics	Lee, 1991; Lee, 1992, Neuman, 2003
Level of involvement of researchers	Involved insiders	Detached outsiders	Denzin & Lincoln, 2000; Lee, 1991; Lee, 1992, Neuman, 2003
Research design	Flexible	Linear	Neuman, 2003; Taylor & Bogdan, 1984

General approach used	Interpretive approach	Positivist approach	Neuman, 2003
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Table 7: Qualitative versus Quantitative Research

A qualitative rather than quantitative methodology was adopted for this study for several reasons (see Table 7). A key distinction between quantitative and qualitative research is that the quantitative approach is objective and relies heavily on statistics and figures, while the qualitative approach is subjective and utilizes language and description (Lee, 1991; Lee, 1992). Quantitative researchers thus seek to measure objective facts, focusing on variables and utilizing statistical analysis, while qualitative researchers prefer to construct social reality and cultural meaning, focusing on interactive processes and events with the use of thematic analysis (Neuman, 2003).

However, by reducing people's worlds and acts to statistical equations, we freeze their social world into a structure of causality, thereby neutralizing the role of the human effect. Hence, to understand the behavior of people in organizations, researchers need to appreciate and describe their culture, and seek answers on how their social experiences are created and given meaning (Denzin & Lincoln, 2000; Lee, 1992; Neuman, 2003).

Hence, since this study focuses on the impact of stakeholders during ES implementations, the qualitative method was selected. It assumes that the social world is made up of nothing more than names, concepts and labels, which are artificial creations whose utility

is based upon their convenience as tools for describing, making sense of and negotiating the external world (Lee, 1992). Social action only occurs when an actor assigns his own meaning to his conduct and the environment.

Qualitative research thus provides a rich and detailed description of these social worlds to help researchers grasp the meaning and significance of social phenomena, and understand the motives, reasons and goals that lead people to act in the ways they do (Denzin & Lincoln, 2000). In this way, it aims to further our understanding of the entire research context by studying all of its constituent parts, such as individual stories, technologies and processes (Scott & Wagner, 2003).

Generally, most quantitative researchers use a positivist approach to their studies, which is based on rigorous, exact measures and objective research (Neuman, 2003). In contrast, the interpretive approach is the main choice for qualitative researchers (Neuman, 2003), as was the case in this study, although it should be noted that the word interpretive is not necessarily synonymous with qualitative (Klein & Myers, 1999).

The interpretive approach is desirable as our knowledge of reality, including the domain of human action, is a social construction of human actors who shape and attach their own meanings to world around them (Newell et al., 2003; Walsham, 1993). The interpretive approach thus facilitates the understanding of phenomena through assessing the meanings that participants assign to them, so that we can interpret this reality in terms of what it

means to the observed people and learn the motivations behind their actions (Lee, 1991; Neuman, 2003; Orlikowski & Baroudi, 1991).

3.1.2 Case Study Approach

The case study approach can be based on both qualitative and quantitative evidence (Yin, 2003), and is but one way of capturing the nuance and complexity of a social situation under study. Other ways include experiments, surveys, histories and the analysis of archival information (Denzin & Lincoln, 2000; Yin, 2003). Each method is suitable under different circumstances (see Table 8).

Strategy	Form of research question	Requires control of behavioral events?	Focus on contemporary events?
Experiment	How, why	Yes	Yes
Survey	Who, what, where, how many, how much, why	No	Yes
Archival analysis	Who, what, where, how many, how much	No	Yes
History	How, why, what	No	No
Case study	How, why, what	No	Yes

Table 8: Relevant Situations for Different Qualitative Research Strategies

(Adapted from Yin, 2003)

This study focuses on the how and why questions surrounding the involvement of stakeholders in ES implementations. As such, an experimental, historical or case study approach could be appropriate (Leonard-Barton, 1990; Yin, 1981; Yin, 2003). Since this study has little control over the ES implementation process, this leaves the historical or case study approach (Benbasat et al., 1987; Staehr et al., 2002; Yin, 2003). Finally, as this study focuses on a contemporary phenomenon within a real-life context, it leaves the case study method as the most viable approach to conducting this study (Leonard-Barton, 1990; Staehr et al., 2002; Yin, 2003).

The case study method is not meant for hypothesis-testing (Leonard-Barton, 1990), but for exploratory, descriptive or explanatory purposes (Neuman, 2003; Yin, 1981; Yin, 2003). Exploratory research occurs when the issue is new. Descriptive research occurs when there is a developed idea about a phenomenon, and the focus is on the how and who questions to paint a detailed picture of a situation, social setting or relationship. Finally, explanatory research occurs when the desire is to build on exploratory and descriptive research to identify the causes and reasons why something happens.

Exploratory research is used in this study to present a picture of who the stakeholders of an ES project are and how they are involved, since the study of the stakeholders of ES implementations is an area of research that is still in its early, formative stages and is not yet theoretically understood (Nah et al., 2001; Van der Blonk, 2003; Walsham, 1993). Finally, this study is conducted in the organization's natural setting since the boundaries

of stakeholder involvement are not clearly evident at the outset of the research (Benbasat et al., 1987; Nah et al., 2001).

Case studies can be of a single-case or multiple-case design (Yin, 1981). Multiple cases usually yield more general research results (Benbasat et al., 1987), while a single-case study is more appropriate if it is a revelatory case of a previously inaccessible situation, a critical case in testing a well-formulated theory, an extreme or unique case, or a representatively typical case (Benbasat et al., 1987; Yin, 2003). The single-case design was thus adopted as this case involves a common event, an ES project, where the lessons learnt should be informative to average organizations involved in such projects.

3.2 Case Selection

Having decided to conduct an interpretive case study, the next step was selecting an appropriate site and unit of analysis for study. Should the study focus on an individual, group, project, organization, movement, decision or event (Benbasat et al., 1987; Neuman, 2003)? This study focuses on a project, in particular an ERP project.

The next consideration is the desired characteristics of the organization and nature of the topic (Benbasat et al., 1987). The researcher sought a site with a multi-tiered organizational hierarchy and distinct departments that interact during the project. As this study sought to understand the role of stakeholders in ES projects, the project should also preferably involve as many internal and external stakeholders as possible.

Finally, the site should have a variety of temporal zones that mark different social realities to provide various stakeholders with diverse incentives and perspectives (Scott & Wagner, 2003). This is especially appropriate in this study, as the stakeholders need to interact with different temporal zones, and thus, need to be managed to minimize potential tensions or collisions.

A university illuminates the notion of a temporal zone nicely (Scott & Wagner, 2003). It has a number of temporal zones in terms of its population of staff, which consists of academic and non-academic staff. Furthermore, its staff is spread across different departments and faculties that interact with one another in using this system. Each group of staff has its own needs and perspectives of the system, and its involvement in the project varies.

The university to be studied had 11 different stakeholders who were involved in the project. They were from inside the department implementing the system, across the university and outside it. Finally, this university had a history of ERP implementation, and had just embarked on a new project. All this made this university an ideal choice for conducting this case study.

3.3 Data Collection

To facilitate the data collection process, the first step was to establish a partnership with the site, rather than a researcher-subject relationship (Taylor & Bogdan, 1984). In fact, almost as much time and effort should be spent on fostering and maintaining this

relationship as on the actual data gathering (Leonard-Barton, 1990). The researcher facilitated this by first contacting a Senior Manager in the department. After convincing him of the validity of the study, the Senior Manager agreed to serve as the gatekeeper for the case study, and facilitated the researcher's access to various documents, and interviewees that were identified from the researcher's initial study of the documents.

To maintain this relationship, the researcher regularly updated the gatekeeper on the study's progress. He also emphasized to the interviewees that the motives of the study were strictly academic and offered to use pseudonyms to maintain anonymity. He even allowed the interviewees to review the factual portions of the study. Finally, he signed a confidentiality agreement and allowed the gatekeeper to have the final say on any publications. This allowed the researcher to build stronger relationships with the gatekeeper and interviewees, gain the desired access to the data and be kept informed of events, which affected the study.

The researcher conducted a thorough literature review prior to the actual study to get a firm grasp of the issues being studied. From there, an initial case study protocol was developed, which included the case study questions, data collection procedures (i.e. interviews and documentation), and an outline of the proposed final report. This protocol was modified during the course of the study as new data was unveiled, but the core of it was largely kept intact as a guide to ensure that the researcher was on track throughout the study. Then, while collecting data, the researcher could focus on data that was

relevant to the role of stakeholders in the ERP project. A sample of this case study protocol is given in Appendix A.

The next step was the data collection itself. In conducting a case study, there are multiple sources from which an investigator can gather data (Leonard-Barton, 1990; Van der Blonk, 2003). The primary sources of data include documents, archival records, interviews, direct observation and physical artifacts (Benbasat et al., 1987; Yin, 1981; Yin, 2003). For this case study, data was collected from documentation, such as project plans and minutes of meetings, and interviews.

Interviewing is one of the most common and powerful ways of understanding our fellow human beings (Denzin & Lincoln, 2000). For this study, the researcher conducted unstructured, open-ended, in-depth interviews with the interviewees. They ranged from 30 minute to three-hour sessions, and utilized a host of communication channels. Initial interviews were conducted face-to-face or via e-mail. For the face-to-face interviews, the sessions were taped where possible. If the interviewee was uncomfortable being taped, the researcher manually transcribed the interview instead. Following each interview, the recordings were transcribed and a copy sent to the interviewee for verification. E-mail and the telephone were used to follow-up if the researcher had additional questions.

During the interviews, the researcher sought to remain unbiased by any preconceived notions, so as to be more sensitive to unexpected or contradictory information. He also kept track of previous interviewee responses while probing the current informant, to

better assess what was said and catch what was unsaid. This enabled him to probe deeper where necessary, especially when there was conflicting data. He employed a flexible interview design so that the research questions and number of interviews could be changed throughout the study as new information was made available. For example, as it became evident that the Development Team was totally uninvolved in the first two phases, it became unnecessary to interview them.

No matter how numerous the observations from a single vantage point, no single perspective is sufficient to reveal the entire pattern (Leonard-Barton, 1990). Triangulation involves the use of multiple data collection methods (Benbasat et al., 1987; Neuman, 2003) and sources of data (Taylor & Bogdan, 1984; Yin, 2003). It allows the researcher to look at a phenomenon from several angles or perceptions, to secure an in-depth understanding of the phenomenon and address a broader range of issues (Denzin & Lincoln, 2000; Neuman, 2003; Yin, 2003).

In this study, triangulation was achieved in two ways. Firstly, through multiple data collection methods, such as interviews and documentations. Secondly, by gathering data from multiple sources of data, namely the 13 stakeholders interviewed, to obtain a holistic picture of the ES project. The 13 stakeholders selected, randomly where possible, represented eight of the key stakeholders involved in the project (see Table 9). The interview transcripts and documents were then analyzed separately, before being compared to ensure that the data converged on a similar set of facts.

Stakeholder	Official appointment in university	Years of experience in current appointment	Duration of involvement in project (Between Mar to Aug 2003)	No. interviewed	Remarks
Steering committee	MIS Manager (HRD)	4 years	6 months	1	2 of the 4 committee members were selected.
	IS Manager (HCD)	8 years	6 months	1	
Project Manager (Lead)	IS staff (HRD)	2 years (in HRD)	6 months	1	Only 1 PM (Lead) in the project.
Project Manager (User)	Assistant manager (HRD)	2 months	6 months	1	Only 1 PM (User) in the project.
User Lead	Leave manager (HRD)	10 years	6 months	1	Only 1 User Lead in the project.
HRD-Users	Leave officer (HRD)	4 years	6 months	1	2 out of the 5 leave officers were randomly selected. Support staff was not interviewed as they were represented by the leave officers.
		4 years	6 months	1	

HRD-IT	IS staff (HRD)	2 years (in HRD)	6 months	1	Only 1 HRD-IT in the project.
Computer Department (HCD)	IS Manager (HCD)	8 years	6 months	1	Not involved much in the initial phases, so only 1 manager was randomly interviewed.
University Staff	Administrative officer	3 years	1/2 day	1	Randomly selected from three departments/faculties.
		5 years	1/2 day	1	
		4 years	1/2 day	1	
		5 ½ years	1/2 day	1	
SAP Lead Consultant	External SAP consultant	8 years	6 months	0	Only 1 SAP-LC in the project.
Development Team	IS staff	Nil	2 months	0	Not involved in the initial phases of the project.
Policy Makers	Top management	Nil	Nil	0	Not directly involved in the project.
TOTAL NO OF INTERVIEWEES:				13	

Table 9: Details of Stakeholders Interviewed

A large amount of data was collected from these sources and all of it was potentially important. To manage this data, the researcher used a case study database. This database contained the case study notes from the interviews, a reflective journal of his observations and document analysis, and the documents relevant to the case.

Several steps were taken to ensure the reliability and validity of the data collected. Firstly, the case study database, coupled with the pre-defined case study protocol, helped ensure the reliability of this study, as it enables another researcher to carry out a similar study in a consistent manner.

Next, the researcher sought to ensure the validity of this study in several ways. The multiple sources of evidence yielded similar results, thus making the findings more convincing and accurate, which contributed to the convergent validity of the study. The convergence of the multiple sources of evidence also supported the accuracy of the measures of the study. In addition, the researcher got the respective informants to review the factual data collected. This contributed to the construct validity of this study.

3.4 Data Analysis

Having gathered the data, the next step was to analyze it. Data analysis consists of examining, categorizing, tabulating, testing or otherwise recombining quantitative or qualitative evidence to address the initial research questions of a study (Yin, 2003). This is an ongoing process that goes hand-in-hand with data collection, although it is only when all the evidence is in that the researcher mostly concentrates on the data analysis

and interpretation (Taylor & Bogdan, 1984). The analysis of the case data depends heavily of the integrative powers of the researcher (Benbasat et al., 1987). Fortunately, the researcher had some prior experience in data analysis, which he picked up during a series of focus groups he conducted in 2002.

The coding process was used to analyze the data collected. Coding is a systematic way of developing and refining interpretations of data by organizing it into conceptual categories (Denzin & Lincoln, 2000; Neuman, 2003; Taylor & Bogdan, 1984). In particular, the coding process of thematic analysis was employed. Thematic analysis moves through three phases of inquiry from recognizing or seeing an important theme, to encoding it, to interpreting it (Boyatzis, 1998).

The first step in this process is the identification of themes. Themes are abstract constructs that investigators identify before, during and after data collection (Denzin & Lincoln, 2000). In this study, each interview transcript and document was analyzed separately, to identify key statements or comments and assign a label to categorize each piece of data. Wherever possible, similar statements or comments were combined under the same label. These labels were then combined into a single list. Again, wherever possible, data from similar categories were grouped together under the same label.

The next step was to find relationships among these labels. To do this, the researcher used clustering, where the multiple themes are organized into groups (Boyatzis, 1998; Neuman, 2003). The researcher also sought links between the themes within and between

groups (Denzin & Lincoln, 2000). In the end, the researcher came up with 15 labels, which were divided into four groups (see Table 10). An example of this three-step thematic process is given in Appendix B.

Theme	Sub-theme
Stakeholder characteristics	<ul style="list-style-type: none">- Authority- Ownership- Domain knowledge- Control of key resources- Special requirements- Value of contribution
Project stakeholders consolidation	<ul style="list-style-type: none">- Have a good mix- Build on existing working relationship
Inter-stakeholder relationships	<ul style="list-style-type: none">- Clarify initial project guidelines<ul style="list-style-type: none">- Keep everyone updated- Involve stakeholders in decision-making- Conflict resolution
Inter-stakeholder knowledge sharing	<ul style="list-style-type: none">- Formal lines of communication- Informal lines of communication- Use IT to support interactions

Table 10: Results of Thematic Analysis of Case Study

As with data collection, reliability is critical in thematic analysis (Boyatzis, 1998). The researcher sought to ensure test-retest reliability by conducting thematic analysis on three occasions. Firstly, during the data collection process on each new transcript or document collected. In this way, the researcher could ensure that the data collected was consistent. When discrepancies arose, he checked with the data source on whether it was an anomaly or truly a new piece of information, and modified the study accordingly.

The second session was conducted when most of the data had been collected, to identify a set of themes for preliminary analysis. The final session was conducted once all the data had been collected to identify the final set of themes for analysis. Consequently, the researcher could monitor that the themes collected were consistent in each session. This also allowed the researcher to ensure that his judgement in developing these themes was consistent at different times and settings, thus ensuring test-retest reliability.

The researcher further sought to ensure reliability by compiling a codebook, which is an organized list of the codes used during the thematic analysis process (Boyatzis, 1998; Denzin & Lincoln, 2000). These codes were developed and refined during each of the thematic analysis sessions to ensure consistency in identifying the themes in each session. Each code consists of a label, a definition of what it concerns, a description of how to identify the theme, a description of any qualifications or exclusions to the identification of the theme, and positive and negative examples to eliminate possible confusion. A sample consisting of two of these codes is included in Appendix C.

3.5 Summary

A qualitative, interpretive approach to this study was chosen, as it supported a subjective study of the stakeholders involved in ES projects, thus helping the researcher to understand the meanings that they assigned to the world around them, and how this affected their actions. The case study methodology was chosen as it enabled the capturing of the nuance and complexity of the social situation, especially since the focus was on how and why questions, and contemporary events, and the researcher had no control over the phenomenon. Considering the unit of analysis of the study, desired characteristics of the site and nature of the topic, a university was selected as the ideal site for the study.

During data collection, triangulation of data methods was achieved as data was collected from secondary documentation and interviews, while triangulation of data sources was achieved as 13 people representing eight of the eleven stakeholder groups were interviewed to provide a holistic view of the phenomenon. The reliability of the process was ensured using a case study database and pre-defined case study protocol. Its validity was ensured by the use of multiple sources of evidence that converged on a similar set of data, and the involvement of informants in reviewing the factual data collected.

Thematic analysis was employed during the data analysis stage of the study to identify the themes embedded in the data collected, to organize these themes into common groups, and to find relationships among these themes. Reliability of the analysis process was ensured by conducting thematic analysis on the data on three separate occasions to ensure test-retest reliability, and by the compilation of a codebook.

Chapter 4

Case Description

4.1 Introduction

The university under study has over 30,000 students and about 6,000 staff. The university first adopted Enterprise Resource Planning (ERP) in the form of SAP systems in 1992. Since then, it initiated several SAP projects, each taking the university one step closer towards its grand design of having a university-wide network of SAP systems.

This study examines the university's Human Resources Department (HRD)'s SAP project to support their university-wide staff leave system, the SAP Time Management (TM) module, which was initiated in March 2003. This is their second SAP project after their SAP Personnel Administration (PA) project in 2001.

This study begins with an overview of the history of ERP implementation in this university. From there, it takes a look at the proposed TM module. Next, it identifies all the stakeholders involved in this project. Finally, it describes the project life cycle (in particular the planning and requirements gathering phases of this project) and the importance of the stakeholders and their relationships during these two phases.

4.2 SAP Implementation Background in the University

The university first adopted the SAP R/2 system in 1992 using mainframe with help from SAP and IBM. This marked the start of the university's migration from its in-house developed COBOL-based financial systems to SAP. A key reason was SAP R/2's functionalities and benefits to users, especially the savings in resources spent on manually generating reports.

Following the success of the SAP R/2 system, the university upgraded to the SAP R/3 system release 2.2B in 1994, taking advantage of client/server technology, while working with HP Services as their implementation partner. The system provided greater transparency, up-to-date information, easy data access, full shared data storage integration, and a user friendly and intuitive graphical interface that gave users greater flexibility and control. This freed up the university's Computer Department (HCD) staff for more strategic work such as security enhancement.

In 1998, the university upgraded to the SAP R/3 system release 3.1H and implemented new modules to improve the university's business processes and to ensure Y2K compliance. In 1999, the university moved to the SAP R/3 system release 4.0B and later, 4.6A, and added other new financial modules. KPMG was involved in the implementation. Consequently, accounts were changed to meet departmental needs, the number of modifications was reduced, and process flow was streamlined.

The university upgraded to the new SAP R/3 system release 4.6B in 2000 and implemented additional modules. During the implementation, the university hired an experienced contract programmer to aid in writing the reports to meet the tight schedule. The Material Management module then went live in May 2000, increasing the efficiency of the university's purchasing procedure.

In 2001, the SAP R/3 Human Resource system was implemented, incorporating among others, the Personnel Administration (PA) module. SAP assisted in this implementation. However, the local address format was not supported by that version of SAP. To overcome this limitation, the university upgraded to release 4.6C in September 2001. Also in 2001, SAP were contracted to develop the SAP Business Warehouse (BW) module and implement the department's meta-data repository. With more participation and having prior SAP knowledge, the IT staff benefited from the knowledge transfer session from the consultant. With these experiences gained, the IT staff was able to work more independently in creating the meta-data repository for HRD.

In 2002, SAP suggested that the university install the SAP Portal 5.0 system and flew in a consultant from Germany to assist in the implementation. The portal was launched in 2002. As the product was new, subsequent support was heavily dependent on SAP consultants. Concurrently, the university's BW system release 2.1C was launched in 2002 to support the university's Finance Department (HFD). This was followed by an upgrade to SAP BW 3.0B in 2003 for its greater range of reporting capabilities and to support HRD. Finally, in March 2003, HRD began work on its new SAP Time Management

module. Simultaneously, the university was asked not to do any extensive customization or modifications to the system as future upgrades may override the changes and impact the operations.

Year	SAP Release	SAP Module	Vendor
1992	SAP R/2	Financial/Controlling, Assets Management	SAP, IBM
1994	SAP R/3 2.2B	Financial, Assets Management	HP Services, SAP
1998	SAP R/3 3.1H	Financial	SAP
1999	SAP R/3 4.0B SAP R/3 4.6A	New Chart of Accounts, Project Systems, Material Management	KPMG
2000	SAP R/3 4.6B	Funds Management, Treasury	KPMG
2001	SAP R/3 4.6C	Human Resources (Personnel Administration, Organizational Management, Funds and Position Management, Payroll)	SAP, Origin
2002	SAP BW 2.1C SAP Portal 5.0	Business Warehouse (Finance), SAP Portal	SAP
2003	SAP BW 3.0B (HR)	Business Warehouse, Human Resources (Time Management)	SAP, Diagonal

Table 11: SAP Implementation Timeline in the University

4.3 The SAP Time Management (TM) Module

4.3.1 Deciding on the TM Module

This study focuses on HRD's implementation of the SAP TM module. According to their web site, HRD offers the following services; the formulation, development and implementation of HR policies, procedures and practices, support and advice on recruitment, appointment, continued employment, promotion, and terms and conditions of service, and the training and development of staff. HRD caters to two groups of staff in the university; academic and non-academic staff.

In 2000, as part of their grand plan for the university's migration to SAP, HCD saw a need for HRD to start migrating its legacy systems to SAP. This was bolstered by the fact that HFD was already using SAP and was looking to move their existing payroll system, which was linked to HRD's Oracle-based personnel administration system, to SAP as well. HRD concurred and phase one of the migration was completed in February 2001 with the implementation of the SAP PA system. As HRD was new to SAP, it took some getting used to, as it was drastically different from their more familiar Oracle system. It was however a necessary process as they knew that more SAP modules would follow. As a project team member explained:

“When the decision was made to move our main HR system to SAP, it was logical that the rest should follow. They are all so linked together”

Also, once the project was completed in 2001, a team of IT staff from HCD was seconded in HRD to manage the PA and other HRD systems. This was welcomed by HRD, as highlighted by one of their staff:

“Having the IT staff seconded in HRD gives HRD greater autonomy, as they can give HRD staff dedicated service.”

After SAP PA was implemented, they assessed which module to implement next. HRD’s MIS Manager discussed the issue with the HRD Director and the SAP consultants were brought in to brief them on the available options. SAP TM was chosen, as it’s only pre-requisite was the PA system, and HRD’s business rules for leave were quite stable.

Between the end of 2002 to early 2003, HRD spearheaded a feasibility study, with help from SAP, on whether the existing system and leave rules could be mapped to SAP. This feasibility study was later used as the first cut for the Business Blueprint phase of the project. Feedback was also sought from the HRD-Users and User Lead during this study to ensure that they were comfortable with the proposal before a decision was made.

HCD would facilitate the software and hardware maintenance of the system, while HRD, in particular the HRD-Users and User Lead, maintained ownership of the system. This was not unique in the university with other departments engaged in similar situations, as it was felt that this gave these departments greater control over their own IT resources.

4.3.2 Overview of the TM Project

The aim of the TM project was to migrate HRD's three Oracle leave systems to SAP. The Oracle-based systems were limited, with the bulk of it being a manual system based heavily on hardcopy applications. It was mostly used for recording purposes and incorporated few operations or business rules, as these were handled separately, sometimes manually. The new system facilitated a more paperless environment, giving greater control and onus on the leave applicant. The system also included various Employee Self-Service (ESS) leave services (e.g. View of Leave History, View of Staff Availability and View of Leave Application Status).

The scope of the system was huge. There were many different leave types, ranging from vacation leave, to medical leave, to absence due to official business and for academic purposes. The strategy was thus to implement the system in phases. The most critical type of leave was the vacation leave and its related leave types, which affected the general University Staff. It would thus be implemented first and rolled out by January 2004 in Phase A of the project. During this phase, various basic services for vacation leave would also be provided on the university's ESS portal.

The other leave types would be implemented in Phase B from January to June 2004, which would be managed separately from Phase A. The remaining ESS portal-related services would also be provided during this phase. Phase A would last about ten months, excluding the Go-Live phase (see Figure 8). The advantages of the January 2004 Go-Live date were twofold. Firstly, the annual batch update program between SAP and Oracle

could be done in parallel. Secondly, the data for these leave types could begin fresh without having to depend on the previous year's data.

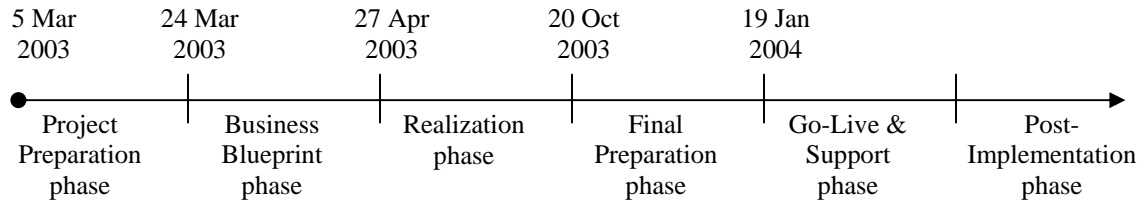


Figure 8: Timeline of the TM Project

Unlike past projects, this project team would manage the TM project with only support and advice from the SAP consultant. This approach would greatly maximize the university's control of the project implementation and knowledge transfer, while allowing their internal IT staff to gain valuable experience in project management. The move to manage the project in-house where possible was also partially motivated by a desire to minimize costs. Implementation costs were reduced with the project team staffed primarily by university employees, and maintenance costs dropped since the team could manage the post-implementation phase without additional support. The team also adhered to a no-modification strategy to ease the implementation process and prevent potential future complications during upgrading. As a project member elaborated:

“Whenever possible, work-around solutions should be considered rather than modifying the SAP R/3 source code to suit existing business processes.”

4.4 Stakeholders of the TM Project

4.4.1 Project Management Team

HRD considered this project to be one of high priority, and staffed their project team with users and decision-makers who were motivated, supportive, dedicated and empowered to make decisions promptly. Leads were assigned to each section (i.e. IT, users, and consultants) to liaise with the Project Managers to facilitate the communication between the stakeholders (see Figure 9).

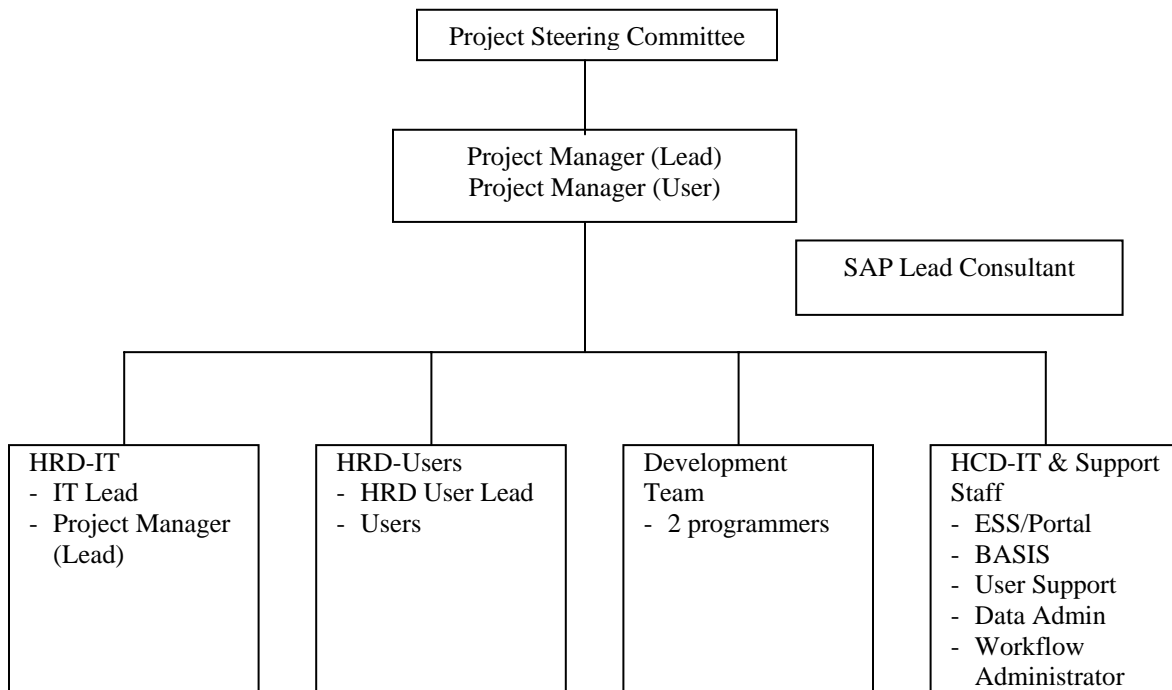


Figure 9: Structure of Project Team

4.4.1.1 Steering Committee

At the helm of the team was the Steering Committee. It comprised of five people; the Director of HRD, Director of HCD, HRD's MIS Manager, a Manager from HCD, and a

representative from SAP. The SAP representative in the committee played a minor role, and mainly sat in on their meetings to keep abreast of the project's progress.

The committee, in particular the four members from the university, were the primary source of information on the university's long-term goals and vision. Their defined roles include setting the priorities, giving the project team direction, approving the project scope, resolving issues that were escalated to them, arbitrating cross-departmental issues, and promoting the project throughout the university. Other responsibilities included the commitment of required resources to the project, monitoring the progress and organizational impact of the project, empowering the team to make decisions, generating timely decisions, and supporting the Project Managers. Where necessary, they even contributed their own inputs as well.

4.4.1.2 Project Managers

They were two Project Managers, one from HRD's IT team and one from amongst HRD's administrative staff. Overseeing them was HRD's MIS Manager, who also sat on the Steering Committee. He was given this responsibility as the project came under the auspices of the MIS division in HRD. Moreover, he had prior experience from serving as the Project Manager (User) and User Lead for the SAP PA project. In essence, he was the project champion for the TM project.

The Project Managers were responsible for the project schedule, overall project planning, managing the project resources, conducting periodic status meetings, and reporting to the

Steering Committee. They had primary ownership of the project deliverables, and provided the day-to-day directions to the rest of the team. They worked closely with one another and molded the team into a cohesive unit.

The Project Manager (Lead)'s primary responsibilities included managing the overall project implementation process, scheduling and planning for the project, managing and assigning project resources, conducting status meetings with the project team, chairing meetings and discussions, reporting to the Steering Committee, and acting as the project librarian. He planned and decided how the above would be done.

The Project Manager (User)'s primary responsibilities included coordinating between Project Manager (Lead), HRD-IT and HRD-Users, participating and managing the resources, activities and schedules of the HRD-Users, managing and planning user tasks, and serving as the assistant project librarian. He also monitored the progress of the HRD-Users and ensured that they did what they were supposed to do, and the HRD-IT got what they required from them on time. In a way, he was a cross between a user and IT staff, and liaised between them. As one member put it:

“I see him as managing the resources on the side of the user, [and] doing all the coordination between the IT and the users.”

4.4.1.3 User Lead

The User Lead led the HRD-Users and was the manager-in-charge of leave matters in HRD. His job scope for this project involved determining user needs and how they could be addressed most efficiently, and coordinating the HRD-Users's efforts. He had several leave officers and support staff under him who dealt with the different kinds of leave.

4.4.1.4 HRD-Users

The Human Resources Department's Users (HRD-Users) are the process owners of this system. They operationally handled the leave at HRD and determined the requirements for the new SAP TM system. There were quite a number of them. Immediately below the User Lead were five leave officers; three overseeing academic staff leave matters, one for non-academic staff leave matters, and one for administrative staff leave matters. Then were the MSOs, or support staff, who handled the actual operational leave matters, such as data entry and so on.

They provided and validated the HR business requirements, were involved in various project activities, and signed off the blueprint and acceptance of the system. Their primary responsibilities included full-time participation in the blueprint workshops to provide the necessary information concerning business policies and processes, clarification of any queries that arose during the business blueprint design, and finalization and confirmation of the blueprint business processes.

4.4.1.5 HRD-IT

The Human Resources Department's IT Team (HRD-IT) worked with the SAP-LC, HRD-Users, Development Team, and HCD-IT in carrying out their designated tasks. The HRD-IT team consisted of the HRD IT staff in charge of the Oracle leave system and the Project Manager (Lead). They configured and developed the TM module, making sure that the specifications desired by the HRD-Users were in line with the existing system design, in terms of the business rules and so on.

Their primary responsibilities included working with the SAP-LC to co-organize and conduct the business blueprint workshop, co-perform the systems configuration, co-create the functional specifications for the Development Team, lead the Development Team, assess the user requirements, and clarify the HRD-Users' doubts or conflicts with the system capabilities.

4.4.1.6 SAP Lead Consultant (SAP-LC)

In addition to the SAP representative on the Steering Committee, there was a second SAP representative who served as the SAP Lead Consultant (SAP-LC) for the project. He was brought in about a week or two after the project kick-off. The SAP-LC assisted the project management team in project planning and implementation.

The SAP-LC's primary focus was the implementation experience sharing and active knowledge transfer to the HRD-IT and HCD-IT. The SAP-LC had to ensure that the project team was properly guided to minimize "trial and error", the steep learning curve,

and the risk of major configuration errors, which could lead to rework. This was augmented by having the project team actively involved in designing the solution and taking ownership of the solution. It also eliminated the need for knowledge transfer at the end of the project. The role of the consultant in this project was decidedly different from their role in the SAP PA project and other university SAP projects.

4.4.1.7 Computer Department

The HCD staff consisted of the IT staff (HCD-IT) and support staff. The HCD-IT in this project provided any additional support required for the project, such as performing relevant system, database, network and authorization administration, as well as for the system's integration with the university's ESS portal and its workflow management. In particular, the ESS portal staff was heavily involved in the project from the Realization phase onwards, while the BASIS team was marginally involved in the initial phases as they authorized the HRD team to use HCD's development system. The data administrators and support staff were only marginally involved in the project, and were only activated towards the end of the project. Finally, the support staff would only be activated during the Go-Live phase, and be tasked with manning the help desk to answer any general queries from the university population.

4.4.1.8 Development Team

The Development Team comprised of two contract programmers hired for this project. They were contracted by HCD but were assigned to work on the TM project. Their role was to handle general development requests, such as developing and maintaining

interfaces, data migration programs, workflow templates for the HR applications, reports that were not supported by the standard SAP, and the batch program.

4.4.2 Other Stakeholders

4.4.2.1 Policy Makers

One important stakeholder group, which was not an official part of the project team, was the Policy Makers. These were the top brass in the university who were tasked with the overall governance of the university and were specifically involved in updating the policies pertaining to leave matters.

4.4.2.2 University Staff

Another group that was not an official part of the project team was the staff of the university who would eventually use this system. This group consisted of the academic and non-academic staff (i.e. from the Management Support Officers to the gardeners) of the university. They came from both the faculties and university departments.

4.5 Project Life Cycle

The project team followed the ASAP methodology for the project. However, for reasons highlighted in section 2.1.4, this study employs a six-step ES project life cycle (see Table 5) to describe the activities and stakeholders involved during the duration of this project (see Table 12), particularly during the first two phases of the project.

Phase	Activities	Stakeholders
1. Project Preparation (5 th Mar 2003 – 23 rd Mar 2003)	<ul style="list-style-type: none"> - Prepare high-level project plan - Internal review of project plan - External review of project plan - Finalize and approve project plan - Executive Kick-Off - Finalize project team 	<ul style="list-style-type: none"> - Steering committee - Project Manager (Lead) - Project Manager (User) - User Lead - HRD-Users - HRD-IT - SAP-LC - Policy Makers
2. Business Blueprint (24 th Mar 2003 – 26 th Apr 2003)	<ul style="list-style-type: none"> - Project team training - Requirements gathering for HRD-Users - Requirements gathering for University Staff - Requirements gathering for other university SAP owners - Produce business blueprint - Review and sign-off business blueprint 	<ul style="list-style-type: none"> - Steering committee - Project Manager (Lead) - Project Manager (User) - User Lead - HRD-Users - HRD-IT - SAP-LC - HCD-IT - Policy Makers - University Staff
3. Realization (27 th Apr 2003 – 19 th Oct 2003)	<ul style="list-style-type: none"> - Produce and review design specifications for configuration and program specifications - Configuration of business 	<ul style="list-style-type: none"> - Steering committee - Project Manager (Lead) - Project Manager (User) - User Lead

	<p>processes</p> <ul style="list-style-type: none"> - Development of reports - Initial review and testing of configured business processes - Go-live check 	<ul style="list-style-type: none"> - HRD-Users - HRD-IT - SAP-LC - HCD-IT - Development Team - Policy Makers
<p>4. Final Preparation (20th Oct 2003 – 18th Jan 2004)</p>	<ul style="list-style-type: none"> - Final testing - End-user training - Prepare production environment - Data migration to production environment - Role-user assignment - Parallel run of Oracle and SAP systems - Approve system and organizational readiness to go-live - Create go-live strategy 	<ul style="list-style-type: none"> - Steering committee - Project Manager (Lead) - Project Manager (User) - User Lead - HRD-Users - HRD-IT - SAP-LC - HCD-IT - Development Team - Policy Makers - University Staff
<p>5. Go-Live and Support (19th Jan 2004 onwards)</p>	<ul style="list-style-type: none"> - Review and refine system - Setup help desk 	<ul style="list-style-type: none"> - Steering committee - Project Manager (Lead) - Project Manager (User) - User Lead

		<ul style="list-style-type: none"> - HRD-Users - HRD-IT - SAP-LC - HCD-IT & Support Staff - Policy Makers - University Staff
6. Post-Implementation	<ul style="list-style-type: none"> - Continuous business improvement - Technology upgrading - Additional end-user skill training 	<ul style="list-style-type: none"> - User Lead - HRD-Users - HRD-IT - HCD-IT & Support Staff - Policy Makers - University Staff

Table 12: Activities and Stakeholders during the TM Project Life Cycle

4.5.1 Project Preparation Phase

4.5.1.1 Activities during this Phase

The first phase was the Project Preparation phase. The first step was the preparation of the high-level project plan. It was produced by the Project Manager (Lead) with some help from the HRD-IT. It covered the project organization structure, roles and responsibilities of the team members, deliverables, implementation strategy, work plan, assumptions and critical success factors. Preparation began in January 2003 because as one member explained:

“So when March came.....it’s basically about 80% ready. So that means the planning stage would be much easier because our documents were already there.”

This Project Manager (Lead) then facilitated the review of the plan internally by the HRD-IT, User Lead and HRD-Users, and externally by SAP. The plan was then approved by the MIS Manager before it was officially finalized by the Steering Committee. During this phase, the project team was also finalized by the Steering Committee.

The project was officially started with an Executive Kick-off in March 2003, where the Project Manager (Lead) presented the plan to the audience, which included the project team, SAP consultants, Steering Committee, process owners and other key university members. This official kick-off highlighted the importance of the project to the university’s overall business goals and commitment of the executive team to the project.

4.5.1.2 Importance of Stakeholders during this Phase

The stakeholders of this project were either of high, medium or low importance during this phase. Due to the university-level appointments of the Steering Committee members, their authority in the university, experience and knowledge of the general direction and policies of the university, the committee was considered one of the most important stakeholders in this phase. They approved the project plan and project team, gave the

green light for the project kick-off and generally retained the final say on what would take place. As one member of the project team pointed out:

“I think the Steering Committee is an [important group]. I think whatever suggestion they put in, we definitely have to consider very thoroughly. Because the Steering Committee also has contact with the Policy Makers, so they will know the direction and what is best for the university.”

The Project Manager (Lead) was also of relatively high importance during this phase, as he was heavily involved in coming up with the project plan and the direction on what needed to be done, as well as spearheading the move to get the plan approved by the Steering Committee, and presenting the final version at the Executive Kick-Off.

Next, there were five stakeholders who were seen to be of medium importance during this phase of the project. The User Lead and HRD-Users were seen to be of medium importance as they had been originally consulted on the usefulness of the SAP TM module to replace the Oracle system before the decision was even made to go ahead with the project. Consequently, they were also involved in contributing to the preparation of the project plan. As for the HRD-IT, they were considered the resident IT experts for this project. Thus, they were also seen as moderately important at this phase and they too helped to develop the project plan.

The role of the SAP-LC in this phase was to advise on the preparation of the project plan, though it was still left up to the project team to decide whether or not to accept his advice. He was also not involved in the actual project management planning matters, contrary to past projects. One team member explained the rationale for this change:

“The IT staff will suffer because when you’re not involved in the project, then suddenly [when] the whole thing is finished, they dump it to them and tell them in a few days what has been done. They’re not able to carry on because they did not physically develop it.”

Even though the Policy Makers were not an official part of this project, they still held some sway over the project team due to their position in the university hierarchy, thus explaining their moderate importance. Anything that they decided at any time that needed to be changed had to take priority. As one member of the project team pointed out:

“You cannot say that policy cannot be implemented because the system cannot support it. Such things won’t be acceptable. It has to be that way So I think it’s something that we can’t have major influence on.”

Finally, there were four stakeholders who were seen as having minimal, or low, importance as this phase of the project. Firstly, there is the Project Manager (User). He officially joined the project team just before the Executive Kick-off, so other than helping the Project Manager (Lead) to prepare for Executive Kick-off, he was not actively

involved in this phase. Similarly, the Development Team had not yet come on board at this point, so they too were not important during this phase.

As for the University Staff, they were less important at this juncture as the project team was dealing with high-level management matters, which did not involve them. Finally, although the system would reside at HCD, they had little power over the project management as HRD owned the system. Thus, they were not involved in this phase.

4.5.1.3 Inter-Stakeholder Relationships during this Phase

There are very few inter-relationships between stakeholders during this phase of the project (see Figure 10). The primary relationship is between the two key stakeholders, the Steering Committee and Project Manager (Lead). There are also secondary relationships amongst the Project Manager (Lead), User Lead and HRD-Users, between the Project Manager (Lead) and the SAP-LC, and between the User Lead and Policy Makers. Finally, there were minor relationships between the HRD-IT and User Lead, HRD-IT and HRD-Users, and Project Manager (Lead) and Project Manager (User).

During this phase, the Steering Committee met for the Executive Kick-Off, where they also endorsed the project. Generally, they only made decisions after gathering feedback from relevant stakeholders via the Project Manager (Lead). Likewise, the decisions they handed down to the project team, though final, were flexible enough to allow the team the leeway to work out the details on how to proceed.

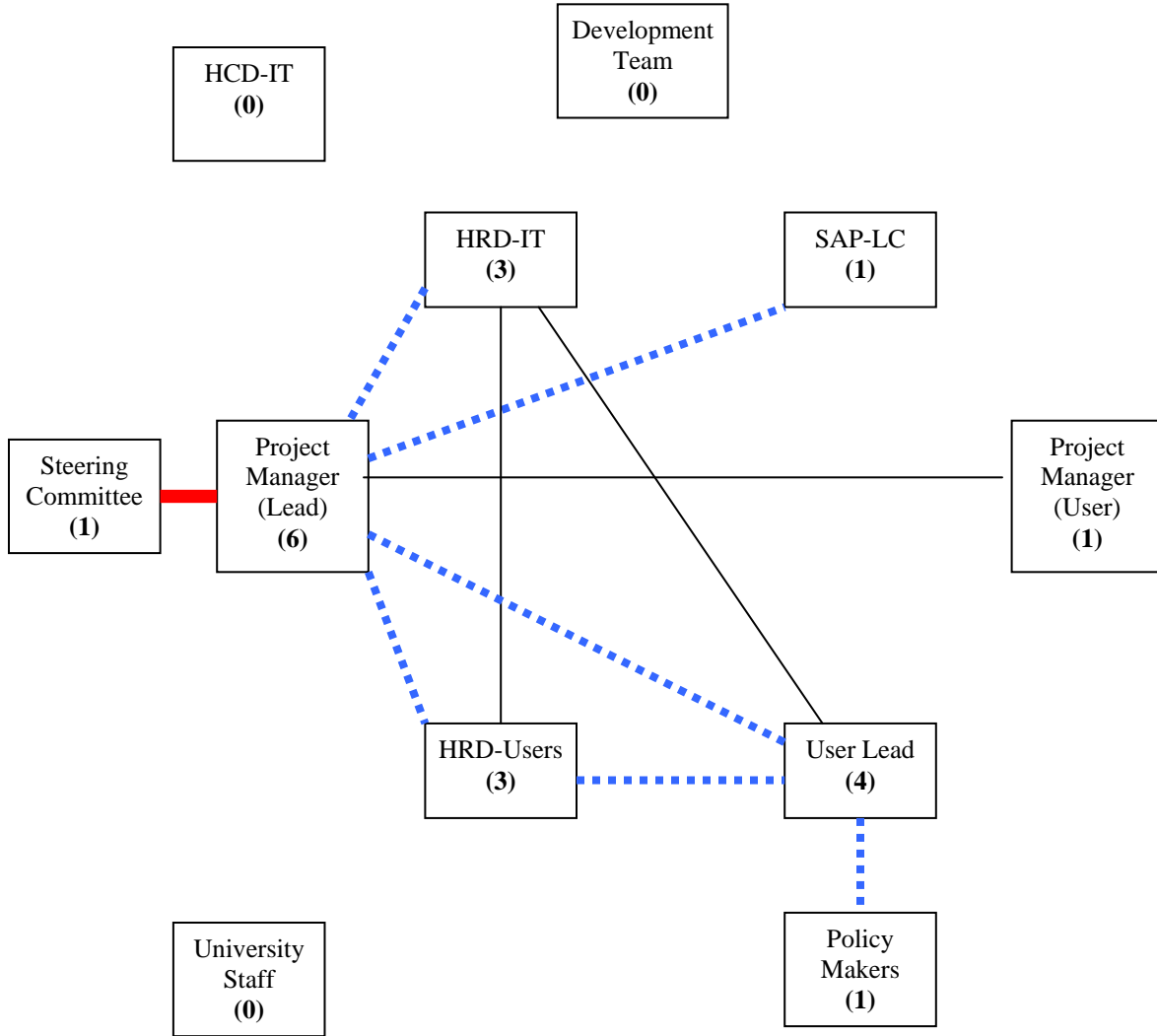


Figure 10: Inter-Stakeholder Relationships during the Project Preparation Phase

In general, the committee’s only point of contact with the project team was through the Project Manager (Lead). Although the SAP-LC, HRD-IT and User Lead sat in on these meetings, their role there was mainly to support the Project Manager (Lead) or answer any queries that pertain specifically to their role in the project.

Although the HRD Director, who was on the Steering Committee, was also involved in changing leave policies, his role in the committee was not to convey directives governing leave policy changes to the project team. Instead, it was the User Lead who served as the contact point with the Policy Makers, and in the event of leave policy changes, dealt with the repercussions by working with the Project Manager (Lead) and the project team.

The Project Manager (Lead) developed the project plan. Generally, the User Lead and HRD-Users had their own internal meetings to work out their schedule and what should be covered in the project. Then, they met with the Project Manager (Lead) to review the project plan and the best way to go ahead with the proposed project. The Project Manager (Lead) would then draw up the final project plan, and it would be reviewed by the HRD-IT, User Lead and HRD-Users.

Likewise, the Project Manager (Lead) interacted with the SAP-LC to get an external review of the project plan, and work out the resources required for the project, timeline, project milestones and so on. During this time, the SAP-LC worked full-time on the project whenever he was requested for the day, and was not supposed to spend that time on any other projects that he had. Though the SAP-LC did interact with HCD prior to the project to work out his contract details, since then he has worked with the project team and not had to deal with them again.

4.5.2 Business Blueprint Phase

4.5.2.1 Activities during this Phase

The next phase was the Business Blueprint phase. The first step in this phase was the two-part essential training provided by the SAP Lead Consultant (SAP-LC) for the project team. The first part was for the HRD-Users, covering a one-day introduction to the module. The second part was technically oriented for the IT team and covered three-days on the configuration of the module, one-day on the configuration of ESS, and two-days on the workflow. As one project member put it:

“The project team training was the first thing done. This was to ensure that everyone was on the same wavelength.”

The business blueprint facilitated understanding of the university’s business goals and determined the business processes required to support these goals. The report from the pre-project feasibility study was used as the first cut for the blueprint. More detailed requirements were discussed during separate workshops for each business process. These sessions were coordinated by the two Project Managers, in particular the Project Manager (User), who worked with the HRD-IT and User Lead to iron out the details from these meetings. These requirements gathering sessions were not just an exercise in getting input from various groups, such as the HRD-Users, HRD PA Users and University Staff. More importantly, they were an avenue for discussion to garner support and consensus on the way things should be done. As a project team member elaborated:

“It’s not just [about] gathering feedback. We still, at the end of it, have to feedback to them what we’re going to do about their feedback, and explain to them the rationale why certain things cannot be done.”

Within HRD, separate requirements gathering sessions were held for the TM module, reporting and authorization functions. In each session, the Project Manager (Lead) led the discussion, with the HRD-Users and User Lead contributing their requirements, while the HRD-IT consolidated and analyzed the requirements with the help of the SAP-LC. The Project Manager (User) was also involved in these sessions. For the general requirements gathering, discussions were also held with the HCD BASIS Team to ensure that the existing architecture was sufficient to support the requirements and to get authorization for the team to use their development system.

The SAP-LC and HRD-IT then developed the detailed business blueprint document, which was reviewed by the HRD-Users. The Project Manager (User) aided the Project Manager (Lead) in ensuring that the document was reviewed in a timely manner and properly signed off. The Project Manager (User) also helped to review the document himself. Finally, the Project Managers, SAP-LC, HRD-IT and User Lead cooperated to ensure that the outputs from this phase were ready as input for the next phase.

4.5.2.2 Importance of Stakeholders during this Phase

This time around, it was the User Lead and HRD-Users who were the most important stakeholders. The User Lead was particularly important during the second phase of the

project as he not only contributed to the requirements for the new system, but also coordinated his staff's contributions as well. As for his staff, the leave officers were involved in every stage of the requirements gathering, while the MSOs were mainly involved at select moments, as and when it pertained to their specific operational duties. One project team member explained why they were seen as so important at this phase:

“They are using it everyday. I mean, the system is meant to help them. If they don't use it, they don't like it, it really defeats the purpose of developing the system. It's really meant to help them so it must serve that purpose. So that's why I think they are very important.”

In this phase, there are six stakeholders deemed to be of medium importance. Although both the Project Managers were involved in coordinating the necessary requirements gathering sessions, they played a secondary role to the HRD-Users and User Lead who were the focus of these sessions. As for the HRD-IT, again, they were seen as the resident IT experts for this project, and they helped to determine the limitations of the system, and ascertained what it could and could not do. As a project team member noted:

“Whether technically it can be done or not, they are the ones who have to assess and finally tell you whether it can be done, or maybe it can be done with more effort, and if they are going to do it. They hold that power in that sense.”

The SAP-LC's role as an advisor in this phase was similar to his role in the last phase, albeit more frequent and intensive. Again, it was up to the project team to decide whether or not to accept his advice, and again, he was not involved in the actual project management planning matters. The Policy Makers too were in the same position as in the last phase. Though not officially involved in the project, they still held some sway due to the ever looming possibility that they could initiate changes to the leave policies.

Finally, the University Staff played a slightly more important role in this phase as compared to the last, as they were involved in several rounds of requirements gathering, so that the project team could garner their input and update them on the proposed system. The only reason why they were not seen to be as important as the HRD-Users in this aspect is that only a select group of representatives from select faculties and departments were involved in these sessions. One team member rationalized this selection process:

“We couldn't possibly talk to every department so we gathered feedback from selected departments. Especially those that we currently know that have additional requirements that our current system couldn't cater for. Or those departments that we know that at certain points in time have raised certain requirements.”

That leaves three stakeholders who have less importance in this phase compared to the rest. The Steering Committee is of lower importance, as although they receive updates on the progress of the project from the Project Manager (Lead) at committee meetings, they

are otherwise not actively involved in the project. As for the Development Team, they were again not involved in this phase, as they had not yet been brought in.

Finally, the HCD-IT is slightly more involved in the project than in the last phase. In this phase, they checked to see if the current systems could handle the needs of the TM module. HCD in general was also involved in the hiring of the contract programmers. Otherwise, the HCD-IT staff was just updated on the existence of this project and that their assistance would be needed as a later phase. As a project member put it:

“HCD they are providing the system. As far as for the requirements setting, they do not have much power over that.”

4.5.2.3 Inter-Stakeholder Relationships during this Phase

In this phase, there were much more interactions between stakeholders (see Figure 11). The primary relationships in this phase was those between the User Lead, HRD-Users and HRD-IT, as the first two worked out the requirements for the proposed system, and the latter consolidated them to draw up the business blueprint.

There were a number of secondary interactions. There were secondary interactions between the Project-Manager (Lead), HRD-IT and SAP-LC to assess the feasibility of the user requirements and write up the business blueprint. There were also secondary relationships between the Project Manager (Lead), and HRD-IT and Project Manager (User), as the first two go through the Project Manager (User) to liaise with the HRD-

Users and User Lead, and vice versa. There were also secondary relationships between the Project Manager (Lead) and HRD-IT, and the University Staff, in particular the IT staff, and between the User Lead and HRD-Users, and the University Staff, in particular the administrative staff. Finally, there was the secondary relationship between the User Lead and Policy Makers, as in the first phase.

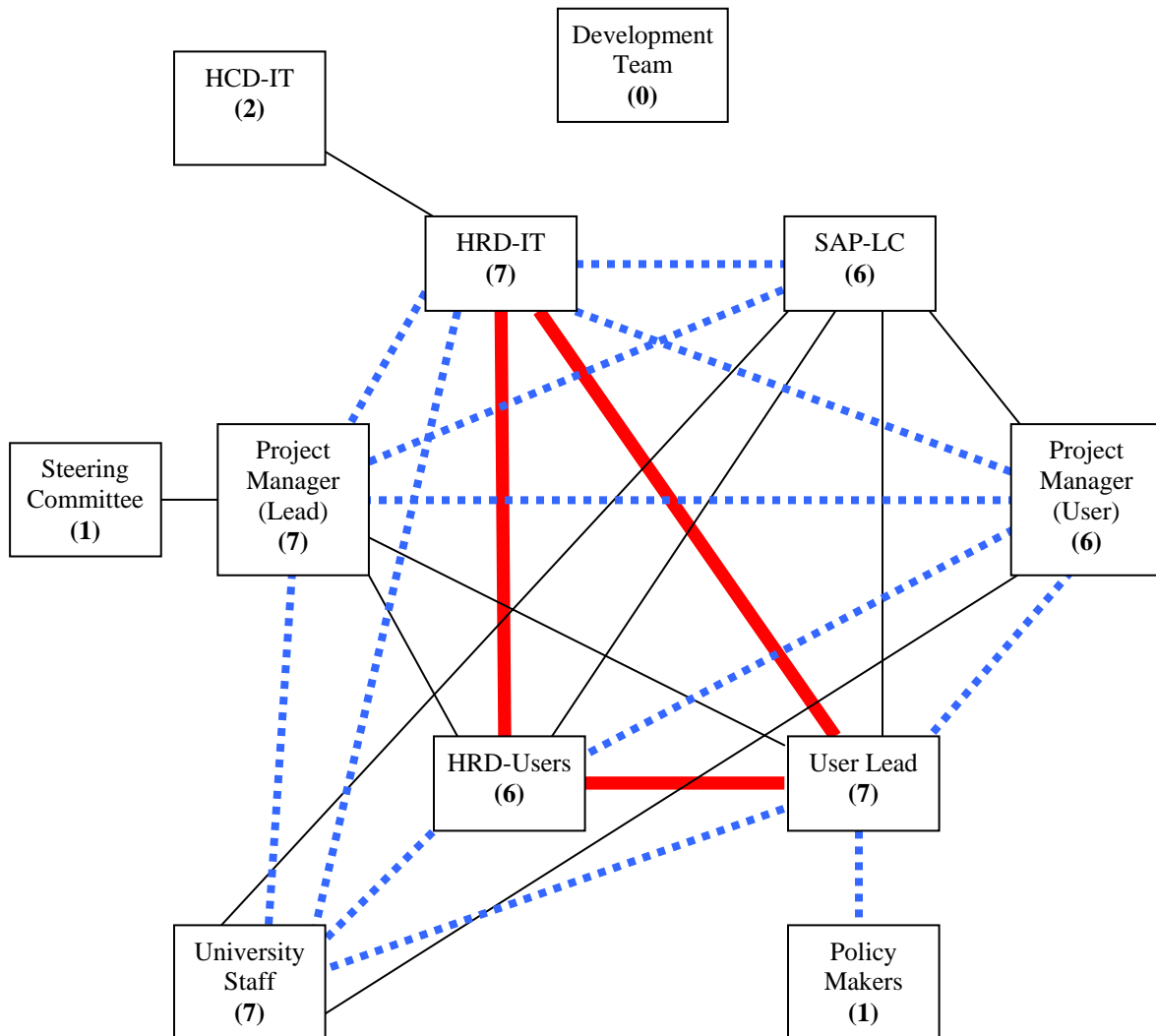


Figure 11: Inter-Stakeholder Relationships during the Business Blueprint Phase

In this phase, there were several minor relationships between the stakeholders. There were relationships between the User Lead and Project Manager (Lead), and between the User Lead and SAP-LC. The SAP-LC also has minor relationships with the Project Manager (User), HRD-Users and University Staff. The Project Manager (Lead)'s relationships with the HRD-Users and User Lead were also minor, as he generally went through Project Manager (User) to interact with them. As for the University Staff, they have minor relationships with the Project Manager (User) and HCD-IT. Finally there's a minor relationship between the HCD-IT and HRD-IT.

In this phase, the Steering Committee only met when the Project Manager (Lead) initiated a meeting to update them on the progress of the project. As in the first phase, their contact with the team was via the Project Manager (Lead), although the Project Manager (User), User Lead, HRD-IT and SAP-LC did sit in on their meetings to answer any questions pertaining to their role in the project or to represent the views of other stakeholders. In general though, it is left to the Project Manger (Lead) to interact with the Steering Committee. Despite this, if the Steering Committee made any suggestions which the others deemed to be logical, they would be given priority in implementation. One project member explained:

“When the next meeting comes, then they [Steering Committee] will want to see if we have done anything. When we talk to the Steering Committee, we have to backup what we say, or they will shoot us down. So we have to be very careful when we talk to them.”

During this phase, the HRD MIS Manager regularly met the Project Managers to discuss project management issues and progress updates. As for the two Project Managers, there were clear distinctions in their roles, but this did not stop them from working very closely together, and at times, there were even crossovers in what they did. For example, although technically the requirements gathering sessions were to be arranged by the Project Manager (User), either manager could coordinate these meetings if necessary.

Essentially, team work and cooperation was vital to the entire team. Thus, informal lines of communication were facilitated such that, for example, it was not always necessary for the Project Manager (Lead) to go through the Project Manager (User) to interact with the User Lead or HRD-Users, he could do so directly. Ultimately, the Project Manager (Lead) is regarded as the overall project leader.

Mostly, the Project Managers interacted with the HRD-IT and User Lead during progress meetings so that the Project Manager (Lead) could be updated on the schedule and status of the project. The HRD-IT and User Lead could then hold their own internal meetings with their teams as they saw fit. Then, the Project Managers would have monthly meetings with the entire project team to update them on the project's general progress.

To facilitate their management of the project team, the Project Manager (Lead) devised a streamlined process for conflict resolution to resolve conflicts within two working days. Issues were preferably resolved within the respective groups. If it could not be resolved,

it was escalated to the Project Manager (Lead) or even to the HRD MIS Manager. Then, if they could not resolve it, it would be escalated further to the Steering Committee for resolution. Generally though, no issues were brought before the Steering Committee as the project team resolved their own problems. As one member explained:

“We tried to resolve differences by having all parties look at different perspectives and attempt to derive win-win solutions.”

The Project Manager (Lead)’s interactions with the User Lead and HRD-Users were infrequent, as most of the contact was handled by the Project Manager (User). The Project Manager (User) handled the bulk of the interactions with the HRD-Users, either through the User Lead or by approaching them directly. He guided them on what they could expect and needed to do during this project, as well as liaised between them and the HRD-IT. Since he was not a specialist on leave matters though, he did not handle the actual gathering of requirements, although he did sit in the requirements gathering sessions. Similarly, he had no authority over the HRD-Users and had to go through the User Lead for that. As such, there was some degree of overlap between his role and that of the User Lead, as both dealt with the HRD-Users.

The Project Manager (Lead) has been liaising with the other member of the HRD-IT since he was officially appointed as project manager in March 2003. Since then, he would regularly seek his advice, especially on matters pertaining to documentation and the leave business rules, since the latter had experience from managing the Oracle system. Then, as

he gradually gained experience and understanding, he was able to take greater control of this aspect of his work and rely less on him.

The Project Manager (User) worked closely with the HRD-IT as well. Except for the very technical discussions, he sat in on their internal meetings. Even though he did not understand all the technical details, he still served an important role as he was the user eye to ensure that all the users' specifications were being addressed.

As in the first phase, the SAP-LC worked full-time on this project. Gradually though, his workload was reduced as the Project Manager (Lead) and HRD-IT picked up the necessary skills to work independently, with the goal of cutting down his involvement in the project to only twice a week on a part-time basis in the next phase, and eventually doing away with him altogether in the post-implementation phase. In this phase though, the SAP-LC had a very close working relationship with the Project Manager (Lead) and HRD-IT, as he taught them the ropes with regards to the technical aspects of the project and guided them during the initial steps for each part of the project. Then, as they gained more experience, they could assume greater control.

In contrast, the Project Manager (User) had little interaction with the SAP-LC outside of the meetings that they sat in on together. Even when he had a technical question, he directed it to the Project Manager (Lead) or HRD-IT instead. There were a few instances though when they did have to work together. For example, when he was configuring a

report that was new to the HRD-Users, he worked with him by acting as the user eye to ensure that the report was accurate before it was presented to the HRD-Users.

During this phase, the User Lead and HRD-Users had the most important interactions, with the Project Manager (User) sitting in on their internal meetings if time permitted and he had some relevant information to convey. Otherwise, these internal meetings were meant to help them work out their requirements for the project. It allowed them to first reach a consensus on their requirements before presenting them to the rest of the team, and in particular the HRD-IT, during formal or informal meetings. Then, they would wait for them to discuss with the SAP-LC and Project Manager (Lead) before giving them feedback. The cycle would then repeat itself until consensus was reached. As one project member put it, this was an ongoing process during this phase of the project:

“We discussed [the requirements] before we put it all in. Then we waited for them to come back and tell us what could be done and could not be done. After that, they tried to consolidate it and make some sense out of it. Then we spoke to certain groups to see whether we could further refine the requirements.”

To do so, the User Lead worked very closely with the HRD-Users. On top of leading them, he was responsible for telling, motivating or initiating them to do things. His position in the organizational hierarchy as the leave manager allowed him to pull rank to

get things done. In between the iterative meetings with the HRD-IT, he worked with the HRD-Users to decide whether to accept his proposals, or how they could be modified.

The User Lead in particular has a rather close working relationship with the HRD-IT, as he helps them to consolidate the requirements from the HRD-Users and other sources. He also led discussions with HRD-Users on their next course of action and conveyed these decisions to him, and vice versa. Furthermore, he helped to moderate their expectations so that they did not go out of scope by encouraging them not to force the issue when their requirements could not realistically be met. In addition, the HRD-IT also had a close working relationship with the HRD-Users. As one project member explained:

“We’re just under one roof. It’s so easy. The users can just go to the HRD-IT’s cubicles or they could just visit them in their office if they have requirements or doubts, or by phone if it’s not so urgent. It’s just very informal. So they do make contact a lot.”

Although the HRD-IT tried to let the HRD-Users freely define their requirements and accepted all their input, it was impossible to satisfy all the requirements. As such, their main aim was to first try and ensure that no key requirements were missed, before addressing the more peripheral ones. They also tried to add value to the requirements by making their own suggestions during meetings to either fine-tune the requirements or explain the system limitations. Generally though, they did not put forward their own ideas in isolation of the user requirements. As a team member clarified:

“If HRD-IT has any value add, of course they can bring it forward, but ultimately the users have to agree. There’s no point if they suggest something that users think is not useful.”

The User Lead and HRD-Users do not deal with the SAP-LC directly. Their interactions with him were mainly reserved for the requirements gathering meetings. During these meetings, the SAP-LC also only provided advice when necessary, and then only to add value to the requirements. Instead, interactions between them were through the HRD-IT.

As in the first phase, the User Lead was the only point of contact with the Policy Makers. This time, there were several policy changes that were initiated by the Policy Makers. The User Lead kept the rest of the team updated as the policy reviews were made so that when the change occurred, it did not come as a complete shock. The plan was that if these changes could not be accommodated, the team would escalate the matter to the Steering Committee for a resolution, although this was ultimately unnecessary.

The HCD-IT interacted with the HRD-IT for two purposes. Firstly, to ascertain whether the current systems and resources in HCD could handle the proposed system’s requirements. Secondly, approval and assistance was needed for the hiring of the two contract programmers for the Development Team. The HCD help desk staff was not involved, as they only come into play during the Go-Live phase.

Finally, the User Lead and HRD-Users organized sessions with select groups of University Staff from across the campus to gather their requirements for the system, and incorporating them into their own list of requirements to be discussed with the HRD-IT. These meetings were generally one-off half-day sessions with no follow-up afterwards although correspondence continued informally largely via e-mail or the telephone if the University Staff had more suggestions or requested feedback on the project's progress.

The two Project Managers, HRD-IT and SAP-LC sat in on these meetings, which were coordinated by the User Lead. The selected faculties and departments were chosen based on whether they had any special requirements or were using their own leave systems, to tap into their expertise in implementing and managing such systems. Even amongst these select few, only a few representatives, mainly from the administrative section, were approached. Consequently, at this phase, the bulk of the university still did not know that this system would be implemented. The team felt that it would be near impossible to try and reach out to everyone due to the sheer number of people in the university. However, one University Staff member offered a different opinion:

“I believe a feedFORWARD rather than feedback system is extremely important (though time-consuming) for buy-in to any new proposed system. The common experience is that positive feedback/suggestions are often constrained by what has already been decided prior to the information-sharing session.”

The HRD-IT also garnered feedback from the faculties and departments' IT staff. Again, only a few face-to-face meetings were conducted for this purpose, with the bulk of the interactions taking place via e-mail or the telephone. Meetings were also arranged between the OHR-IT, and the owners and IT support of SAP PA and HFD. Since all their systems were meant to be inter-linked, these meetings were meant to ascertain how their existing systems would be affected by the proposed system, and what could be done to minimize any potential disruptions.

4.5.3 Realization Phase

The next phase of the project would be the Realization phase. In this phase, the HRD-IT and SAP-LC will co-configure the business processes as identified in the blueprint. This will provide the maximum knowledge transfer by allowing the HRD-IT to carry out the desired configuration of business processes and fine-tuning of the system, while supported by the SAP-LC. These configured business processes will be regularly played back to the HRD-Users for confirmation. Once the system is ready, the HRD-IT will test the work schedule, workflow and batch program on a test server, while the SAP-LC will perform a Go-Live check to ensure that the system is ready to be rolled-out.

4.5.4 Final Preparation Phase

The fourth phase is the Final Preparation phase. The purpose here is to complete the final system testing, train the end-users, cut-over both the data and system to a production environment, and create a Go-Live strategy. Finally, approval is needed for the system

and readiness of the university to Go-Live. As a backup, both the Oracle and SAP systems will be run in parallel for the annual program update.

4.5.5 Go-Live and Support Phase

In the final Go-Live phase of the ASAP methodology, the system will be reviewed and refined by the university to ensure that the business environment is fully supported. This process will not only involve the verification of the accuracy of the business transactions, but also the informal interviewing of the users to verify that their needs have been met. HCD will provide a help desk that will be briefed by the project team, to further support the users as necessary. This phase lasts until “normal operations” resume.

4.5.6 Post-Implementation Phase

The final step of this project is when the university finally reaps the business benefits of the new system. This phase will take place after the project goes live, and will entail further business improvements, upgrading of the technology, and additional end-user skill training. During this phase, the project team will have been disbanded, leaving the User Lead, HRD-Users, HRD-IT, University Staff and Policy Makers involved with the system as part of the regular daily operations. This phase is not included in the ASAP methodology since the Go-Live phase marks the end of this particular project and hence the vendor’s contract with the university. As such, HRD does not explicitly define the abovementioned activities as being part of a separate phase. Instead, HRD sees this as a logical continuation of the Go-Live phase, and thus treat the two phases as one.

Chapter 5

Research Findings

This study aimed to move away from a technical analysis of ES implementations and refocus our attention on the people involved in these projects. Stakeholder analysis provides a more comprehensive understanding of the role and impact of stakeholders in such projects, which then leads to more efficient management of these stakeholders to maximize their potential during the project.

5.1 Stakeholder Identification

In line with existing Stakeholder Theory models, the first step of stakeholder analysis should be the identification of the stakeholders involved in the ES project (Frooman, 1999; Wolfe & Putler, 2002). This is particularly important when analyzing ES projects as such projects involve large numbers of different groups of stakeholders from within and without the organization (Schneider, 2002). Thus, before an organization can manage its stakeholders, it must first know who the project's relevant stakeholders are. This study posits that this is a crucial step that is absent from Mitchell et al. (1997)'s model.

Relevant stakeholders should be identified so the organization can have a holistic picture of all the parties who can affect or be affected by the project. Previously, organizations focused on its shareholders, but they soon realized that "stakeholder" is not synonymous with "shareholder" (Clarkson, 1995). The focus then expanded to include other

stakeholders, such as top management (Livermore & Ragowsky, 2002) and users (Kræmmergaard & Rose, 2002), but still, not all stakeholders were being identified.

Failure to identify a stakeholder, especially one who on the surface may not appear to directly affect or be affected by the project, can have potentially disruptive consequences. This was evident in the case, as the Policy Makers were not included in the project plan. However, as it turned out, they initiated several policy changes during the course of the project that affected the system and the team had to make changes accordingly. Such disruptions could have been minimized if the Policy Makers had been identified from the offset as a relevant stakeholder and were included in the project plan.

This study uncovered three areas to be addressed to facilitate the stakeholder identification process. These areas are key activities identification, relevant stakeholder involvement identification and relevant inter-relationships identification.

5.1.1 Key Activities Identification

A comprehensive list of stakeholders cannot be generated merely by focusing on only one phase of the project, as each phase is characterized by its own key players, activities, problems, metrics and outcomes (Markus & Tanis, 2000). For example, by focusing on the stakeholders involved in the Project Preparation phase of the case, only eight of the eleven stakeholders would have been identified (see Table 12). The entire project life cycle should thus be analyzed to facilitate the identification of all relevant stakeholders.

However, an analysis of the entire ES project life cycle is a big task. As such, each phase should still be studied separately first, before a complete list of the stakeholders involved in the project is consolidated. The question is thus how each phase should be studied to facilitate the identification of the relevant stakeholders in that phase. As a primary difference between each phase is the activities in that phase (see Table 12), it follows that the identification of these activities is a fundamental first step towards the identification of the stakeholders in that phase.

For example, during the Project Preparation phase of the case, the key activities are high-level tasks involving the definition of the project plan and team, which point to the involvement of top management. In comparison, during the Business Blueprint phase, the activities mainly involve requirements gathering and business blueprint development, which point to the involvement of users who can contribute these requirements.

The key activities in each phase of the project thus need to be clearly identified before the project can begin. The identification of the key activities in each phase of the projects then serves as an important benchmark towards the identification of which stakeholders are involved in that phase and how they interact with one another, which will be described in detail in the subsequent sections.

5.1.2 Relevant Stakeholder Involvement Identification

Having identified the key activities, the next step is the identification of the stakeholders involved in those activities. A common pitfall in this process is a tendency to conduct

such identification solely from a single point of view, particularly from the management point of view, as was evident in Freeman (1984)'s definition of a stakeholder (Friedman & Miles, 2002; Pouloudi, 1999). This misconception that one stakeholder knows best may result in an incomplete picture in terms of the number and degree of involvement of stakeholders in the project.

For example, in the case, the University Staff did not mention the Steering Committee as being part of the project team, as there was no interaction between them, and hence they had little knowledge of the degree of involvement of the committee in the project. Thus, stakeholder identification from a single perspective could result in certain stakeholders being overlooked.

To counter this myopic view, it is recommended that stakeholders be identified based on input from all the relevant stakeholders, as each has its own views as to who other stakeholders are (Pouloudi, 1999). Furthermore, this should be pegged to the identification of stakeholders based on each activity in a given phase, to further ensure that nobody is overlooked.

For example, during the Business Blueprint phase, a subset of the University Staff identified as relevant during this phase are the other SAP owners in the university whose systems would be integrated with the TM system. They were only involved in one activity in this phase. As such, if this activity had not been identified, this particular subset of staff could have been overlooked. Consequently, the final TM system could

have faced integration problems with the other existing SAP systems. Thus, there is a need for the identification of all the relevant stakeholders involved in each phase and this is only possible based on the identification of the key activities in that phase.

5.1.3 Relevant Inter-Relationships Identification

In addition to identifying the nodes of the network (i.e. the stakeholders), there is a need to simultaneously identify the links between these nodes (i.e. their relationships). As a stakeholder's actions are based on his relationship with the organization and the interaction of multiple influences from other stakeholders (Nambisan & Agarwal, 1998; Rowley, 1997), stakeholder identification should also cover these inter-relationships. Not only is it enough to identify who interacts with whom, it is also necessary to identify their degree of interaction, such as its intensity and frequency. This is important as it identifies which relationships, in addition to which stakeholders, are more deserving of attention.

There is a tendency to focus on the interactions between select pairs of stakeholders or between top management and stakeholders, as stakeholder relationships are seen as either simple dyadic pairs (Rowley, 1997) or a bicycle-wheel with the organization at the center (Mitchell et al., 1997). Such a view does not do justice to the true complexity of stakeholder relationships during ES projects (Pouloudi, 1999). For example, adopting a bicycle-wheel view during the Business Blueprint phase of the project with the Project Manager (Lead) at the center of the wheel would have resulted in the identification of seven relationships, whereas a holistic view of all the interactions between the stakeholders would have resulted in the identification of 25 relationships.

In addition to the number of relationships that exist in an inter-stakeholder network, there is also a need to look at the strength of each relationship, its frequency, the extent to which the stakeholder connects to other stakeholders, and so on. These can be considered to be key determinants of the behavior of stakeholders during the project (Murphy & Chang, 2002).

For example, in the Business Blueprint phase of the case, the HRD-IT interacted with HCD, SAP-LC and HRD-Users, but these interactions varied. Their interactions with the HRD-Users were highly intense and frequent, as they gathered their requirements. Their interactions with the SAP-LC were less intense and less frequent, as they were largely advisory in nature. Finally, their interactions with HCD were minimal, as they involved ensuring that the existing systems could handle the TM module, and the hiring of the contract programmers. Thus, it would seem that faced with a choice, the HRD-IT – HRD Users relationship is more important as it pertained to a more critical aspect of the project. Such insight could not have been gained if these relationships had not been studied in-depth.

In addition to identifying the visible inter-stakeholder relationships, it is equally vital to identify absent relationships. A relationship could be absent for various reasons, such as that stakeholder is unimportant at that point in time, or interactions with him are moderated through a third-party. This level of understanding provides greater insight into the interactions between the stakeholders in the network.

For example, the only relationship between the Policy Makers and the team was via the User Lead. Thus, it behooves the team to ensure that the User Lead is capable of dealing with the Policy Makers, and more importantly, is as an effective gatekeeper of information to and from the Policy Makers that could impact the project.

5.1.4 Stakeholder Identification Model

This study proposes that a good way of identifying ES project stakeholders is by first identifying the key activities in each phase of the ES project (see Table 12). For each activity, the organization can then simultaneously identify who the stakeholders involved are and how they interact with one another. This information can then be consolidated to generate a list of the relevant stakeholders in each phase of the project (see Figure 12).

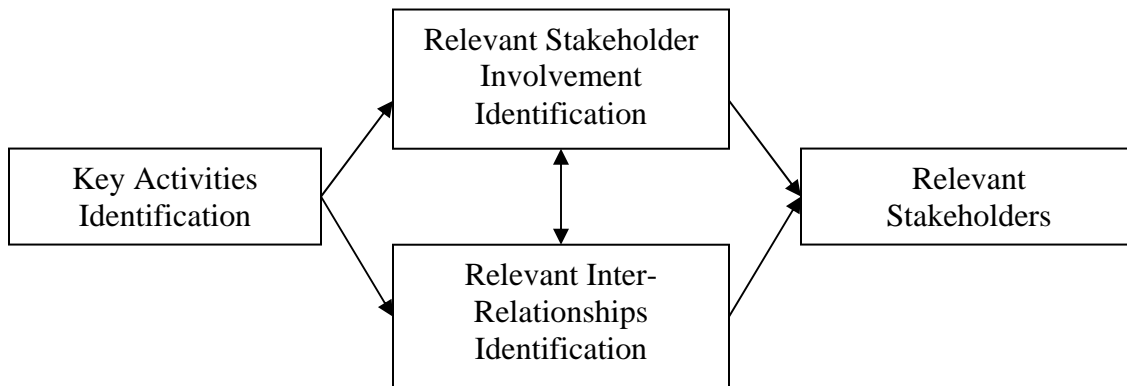


Figure 12: Stakeholder Identification Model

For example, during the Business Blueprint phase, a key activity identified was the gathering of requirements from the HRD-Users. This involved the two Project Managers,

HRD-Users, User Lead, HRD-IT and SAP-LC. The HRD-Users and User Lead's interest here was to share their knowledge on leave matters to conform the system to their needs. The HRD-IT's primary interest was to gather these requirements and translate them to system configurations. The SAP-LC's main interest was to assess the validity of the requirements and assist the HRD-IT. Finally, the Project Managers' main interest lay in facilitating this requirements gathering process. Consequently, this information also led to the identification of the degree of inter-relationships between these stakeholders.

5.2 Stakeholder Prioritization

Having identified all the relevant stakeholders of ES projects, organizations generally realize that they have to cater to numerous different stakeholders. In the case, eleven stakeholders were identified. Though organizations should aim to meet the needs of all their stakeholders, simultaneously fulfilling all the organization's responsibilities towards them is highly unlikely (Jawahar & McLaughlin, 2001), especially given the limited resources available. Thus, there is a need to prioritize these stakeholders (Starik, 1994) so that the more important stakeholders can receive attention first.

The problem facing organizations and researchers here is how best to differentiate between these stakeholders. Mitchell et al. (1997) identified three characteristics, that is, power, legitimacy and urgency, to facilitate this but as explained in section 2.3, these characteristics are inadequate for stakeholder analysis of an ES implementation.

Instead, six characteristics were identified from the case that more accurately differentiated between the stakeholders of the ES project in the case. Each stakeholder possesses one or more of these characteristics. Possession of these characteristics is generally variable and can change at any time. For example, the authority of the Steering Committee may be a big factor during the Planning phase of the project when the project plan had to be approved, but is less so in the Business Blueprint phase when the focus shifted to the gathering of user requirements. Possession of these attributes is also not a simple yes or no issue. Rather, stakeholders can have different degrees of possession of the same attribute. For example, although both the HRD-Users and University Staff have knowledge on leave policies, the degree of knowledge of the HRD-Users is significantly higher as they work in HRD.

These six characteristics are divided into three pairs. The first pair concerns the legitimacy of the stakeholder and his suggestion. The remaining four characteristics concern the sources of power of the stakeholders of the ES project, with the first two characteristics, termed Level A sources of power, being those that are essential to the success of the project, and the last two, termed Level B sources of power, being supplementary characteristics that support the Level A sources. No characteristics were explicitly identified in this study with regards to urgency, as in the case, urgency was seen to be a minor issue that overlapped the above six characteristics.

5.2.1 Stakeholders' Legitimacy Characteristics

The first pair of characteristics concerns the assessment of the legitimacy of the stakeholder and his suggestion, which impacts the validity of his contributions to the project. The first characteristic is the value of the stakeholders' contributions. Past literature focused on using stakeholder attributes to differentiate between them. From the case though, one of the most important differentiating factor was in fact identified as the value of the contribution per se. Thus if two stakeholders made suggestions, the team would first assess the legitimacy or value of the suggestion itself, before deciding on which stakeholder is more important, if necessary.

Having ascertained the legitimacy of the suggestion, the next step is to ascertain the legitimacy of the stakeholder making the suggestion. This involves the degree of ownership of the system (Clarkson, 1995), which is the degree to which a particular stakeholder owns the system being implemented. This impacts more on the decision-making ability of the stakeholder on matters pertaining to the project. For example, in the case, although the TM module was running off HCD systems, HRD retained ownership of the system since they were its primary users, and hence, HRD staff led the project team and made the key project decisions.

These two characteristics are assessed independently of one another, and need to be addressed in the initial stages of stakeholder prioritization. Furthermore, although ownership of the system generally remains unchanged throughout the project, the value of the contributions can vary dramatically for each contribution made.

5.2.2 Stakeholders' Level A Sources of Power

Level A sources of power are essential to the successful operation of the project. From the case, the two Level A sources of power identified are authority and domain knowledge. Level B sources of power are supplementary sources of power that can be addressed later in the project after stakeholders possessing the Level A sources of power have been catered to.

Level A sources of power should be assessed concurrently, as it is possible for a stakeholder to have none, one or both characteristics. The first characteristic, authority, is based on the stakeholder's access to coercive, utilitarian or normative means of imposing its will in a relationship (Howard et al., 2003). An example of this is the Policy Makers. Though not directly involved in the project, their ability to change leave policies enabled them to affect the project, as the team had little choice but to try and incorporate their changes into the system. Also, in the absence of a clear team hierarchy, project members fell back on established lines of organizational authority. This was exploited in the project team design in the case, as the HRD manager in charge of leave was appointed as the User Lead since the User Lead had to oversee the HRD-Users. He was thus able to exploit his authority from his official appointment in HRD to support his role as User Lead in getting the HRD-Users to do whatever was necessary.

ES implementations require a combination of different skills and expertise to implement it successfully (Livermore & Ragowsky, 2002). Stakeholders who possess these skills

and knowledge, control necessary information that can affect the outcome of the project (Coff, 1999). In the case, this was a major factor in the high level of importance of the HRD-Users during the Business Blueprint phase, as they had in-depth knowledge on leave matters, which was unavailable to the rest of the project team.

Possession of these characteristics is not a simple yes-no proposition. In actuality, stakeholders may possess either characteristic to varying degrees. For example, while both the HRD-IT and SAP-LC are classified as having domain knowledge, the HRD-IT's domain knowledge is heavily geared towards the internal IS in HRD while the SAP-LC's domain knowledge is on the SAP system.

5.2.3 Stakeholders' Level B Sources of Power

The final two characteristics are the Level B sources of power. The first characteristic is the control that a stakeholder has over resources that are necessary for the ES project, which gives them a bargaining chip. In the case, this was evident for HCD. Although HCD was not officially involved in the project until the latter phases, they were still consulted in the first phase as they approved the hiring of the contract programmers and confirmed that the TM module could be supported by the existing systems.

These issues though, were not really crucial to the implementation of the system. For example, if they decided not to hire additional programmers, it just meant more work for the existing IS staff and maybe a longer project duration, or if they felt that the current

systems could not handle the load, it just meant that the system had to be streamlined. Thus, the control of resources is still less important than the Level A sources of power.

As for the special requirements, this should be catered to when fine-tuning the system to meet as many diverse needs as possible. The reason for this being a Level B source of power is because ultimately the primary features derived from the domain knowledge of the key stakeholders still need to be catered to first during the implementation of an ES project. These special requirements can then be assessed separately and only those that can be accommodated may subsequently be incorporated into the system.

As with the legitimacy characteristics, these characteristics are assessed independently of one another, and should be addressed in the final stages of stakeholder prioritization. Generally, the import of these two characteristics with respect to one another, and thus which characteristic is more important, depends on the situation. For example, the special requirements of the University Staff only become important during the requirements gathering phase and not at any other times.

5.2.4 Stakeholder Prioritization Model

In summary, the importance of a stakeholder, based on the stakeholder prioritization process, is assessed in three steps (see Figure 13):

1. The legitimacy of the stakeholder and its suggestion is assessed to ascertain whether the contribution should be considered.

2. If the contribution is legitimate, the importance of the stakeholder is deduced based on whether it has the above Level A sources of power.
3. In the event that two stakeholders have the same degree of Level A power, their degree of Level B sources of power is then used to differentiate between them.

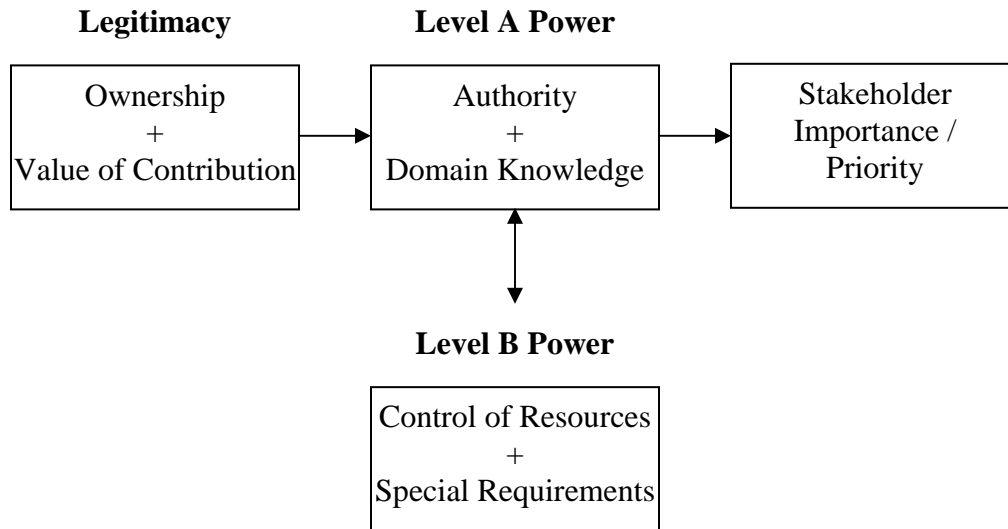


Figure 13: Stakeholder Prioritization Model

5.3 Stakeholder Management

Understanding your stakeholders is one thing. Doing something about it is another. The emphasis of Stakeholder Theory literature has thus far been on stakeholder identification and prioritization, as was evident in the four stakeholder theories presented above. ES implementation literature in particular suffers from a big gap in terms of ways to simultaneously manage the network of stakeholders involved in such projects. There is thus a need to go beyond the identification and prioritization phases of stakeholder analysis, and focus on how organizations should manage their different stakeholders

(Jawahar & McLaughlin, 2001). This is a crucial phase as only by effectively acting on this knowledge of stakeholder differences can organizations better maximize their contributions during ES implementations.

Three areas from the case study were identified as important in the stakeholder management process. They are project stakeholder mix, inter-stakeholder relationships facilitation and inter-stakeholder knowledge sharing facilitation.

5.3.1 Project Stakeholder Mix

The mix of ES project stakeholders should be a balanced representation of all four stakeholder categories, namely top management, end-users, internal IS staff and external third-parties, to ensure a good combination of knowledge, skills and experience (Sarker & Lee, 2003; Staehr et al., 2002; Willcocks & Sykes, 2000). This better enables the organization to achieve alignment on the objectives of the project (Luftman et al., 1999).

This was evidently important in the case, as the project stakeholder included representatives from seven of the eleven stakeholders identified, while the other four had spokespersons (i.e. the User Lead spoke for the Policy Makers, the HRD-Users for the University Staff, and the HRD-IT for HCD and Development Team). These seven stakeholders also represented the four main stakeholder categories, and were from both within and without HRD.

Another important feature of ES project stakeholders highlighted in the case was that they should preferably be included based on existing organizational relationships to tap into the trust and working relationships between these stakeholders, which is harder to develop without a prior long-term relationship (Natovich, 2002).

For example, one member of the HRD-IT handled the existing Oracle system. Thus, he could make the most of his existing long-term relationship with the HRD-Users and their trust in his understanding of their requirements. In addition, HRD also employed the same SAP consultant as in their past project, as the consultant was familiar with the way they worked and could thus better meet their needs.

The mix of project stakeholders should also be flexible, as stakeholders are dynamic during the course of ES projects, with their roles and interactions varying according to the phase they are in (Pouloudi, 1999). This can be facilitated based on the information gleaned from the stakeholder prioritization process. To maximize its flexibility, the mix of project stakeholders should include a fixed and a variable component.

For example, the fixed component could consist of the stakeholders who manage the overall project (e.g. the Project Managers and HRD-IT), while the variable component consists of the other stakeholders who are involved in the project proper only when it is necessary to tap into what they have to offer (e.g. University Staff). This was evident in the case as the Project Manager (Lead) was involved in the project from the start, while the Development Team was only involved later during the system development.

5.3.2 Inter-Stakeholder Relationships Facilitation

The second issue to be considered for efficient stakeholder management is the facilitation of inter-stakeholder relationships. As identified in section 2.2.2, stakeholder relationships are not limited one-to-one interactions, but are a complex array of multiple and interdependent relationships that exist in stakeholder environments (Howard et al., 2003; Pouloudi, 1999; Rowley, 1997). In fact, consistent with social network analysis, the nature of ties developed by a particular stakeholder with other stakeholders determines the extent to which the former will adopt and use a system (Nambisan & Agarwal, 1998). Thus, effective stakeholder management is not just about managing each stakeholder, but also about simultaneously facilitating their inter-relationships.

From the case, this study identified three issues which impact on the facilitation of inter-stakeholder relationships during ES projects. The first issue is the involvement of stakeholders in the ES project decision-making and evaluation process. The involvement of all relevant stakeholders in this process is important as a system characterized by majority-based or consensus-based decision-making generally generates more satisfactory results, while a system characterized by seniority-based decision-making is associated with more negative results (Reimers, 2003).

This was exemplified in the case by the actions of the Steering Committee when they were deciding on proceeding with the project. Although the decision was solely theirs as they had the authority to enforce their decision, they sought input from the User Lead and

HRD-Users. This gave them more perspectives on the project and helped to alleviate any potential dissatisfaction by getting everyone to agree that the system was the best thing for the department.

The involvement of stakeholders in the decision-making process is especially important in ES projects, as it helps to reduce misfits between the different stakeholders who are involved. This leads to the second issue, that is, stakeholder awareness and understanding of the multiple, sometimes conflicting, interests of different stakeholders (Collins, 1994). Raising such awareness allows stakeholders to better understand one another's points of view, so that instead of always insisting on getting their own way, they are better able to compromise and meet each other halfway.

It was evident from the case that a potential source of misfit between stakeholders was between the users' business requirements and IS staff's technical requirements. This was minimized in the case, as the HRD-IT and SAP-LC consulted the HRD-Users and User Lead regularly during the project, particularly during the requirements gathering phase. Formal and informal sessions were conducted between them to ensure that all the HRD-Users' requirements were analyzed, and where the requirements were not feasible, they worked closely to develop viable alternatives. Consequently, the HRD-IT and SAP-LC better understood the business requirements, while the HRD-Users and User Lead better understood the system capabilities. This helped to reduce potential future conflicts over what the final system would entail.

Despite efforts to build a strong web of inter-stakeholder relationships to minimize conflicts, the reality is that stakeholder activities are highly interdependent, thus creating a high potential for conflict within and across stakeholders (Kochan & Rubinstein, 2000). Thus, the final issue is the need for an efficient process of stakeholder conflict resolution. Swiftly and efficiently nipping such conflicts in the bud prevents the conflict from getting out of hand and affecting the success of the ES project.

In the case, the project team had a clear four-step process in place to deal with conflicts, which aimed to resolve any conflicts within two days at most. Basically, the HRD-IT and User Lead were given the freedom to resolve conflicts in their teams. If they could not handle the conflict, it would be passed on to the Project Manager (Lead) to resolve. If he was unable to resolve it, he brought it up to the MIS Manager. Finally, if he was unable to help, the issue would be brought up to the Steering Committee. This process proved successful, as there were only a few cases of differences among stakeholders, which were swiftly dealt with by the HRD-IT, User Lead, Project Manager (Lead) and MIS Manager. This success could be attributed to the clearly defined levels of conflict resolution, whereby stakeholders had greater flexibility to resolve issues among themselves instead of always having to involve their superiors.

5.3.3 Inter-Stakeholder Knowledge Sharing Facilitation

The final issue to be considered in the stakeholder management process is the facilitation of inter-stakeholder knowledge sharing. The convergence of the knowledge domains of

stakeholders supports the need for new knowledge management approaches to facilitate information across the boundaries of stakeholders (Baskerville et al., 2000).

Stakeholders require an environment in which they are willing and able to share their knowledge with other stakeholders to reach a mutual understanding (Reich & Benbasat, 2000) and increase collaboration (Jones & Price, 2001). This is especially important in ES projects, as knowledge domains are diversely spread across different departments and stakeholders, and even come from both within and without the organization.

From the case, this study identified three issues which impact on the facilitation of inter-stakeholder knowledge sharing during ES projects. The first issue is the regular updating of all relevant stakeholders of ES projects. Regularly updating them on what is happening in the project, and what and when they would be involved in it, ensures that they share a common view of the proposed system, thus increasing their preparedness to contribute and acceptance of the system. Keeping stakeholders updated can also increase transparency to reduce potential interpersonal conflicts, which could otherwise have arisen if a stakeholder is kept in the dark and mistakenly feels that his interests are being intentionally opposed by another party (Barki & Hartwick, 2001).

This was facilitated for most of the stakeholders in the case. For example, though HCD was only involved in later phases, they were informed during the planning phase of when they would be roped in and what would be needed of them, so that they could better plan their schedules. One exception to this was the University Staff who were only selectively

updated on the system and involved in its development. As such, they did not know quite what to expect or what was expected of them.

The second issue identified is the efficient use of both formal and informal lines of communication between stakeholders. Many project failures can be traced to a breakdown in communications (Jurison, 1999). Without a strong communication culture and formally established avenues of communication, stakeholders find it hard to understand and work with one another.

An example of the lines of communication in the case was the formal line of communication between the Steering Committee and the rest of the project team via the Project Manager (Lead). This enabled the lines of communication to be streamlined as both the committee and team received and disseminated important information to and from just one source, namely the Project Manager (Lead).

In addition to formal lines of communication, there should also be sufficient avenues of informal communication between the stakeholders to ensure greater mutual understanding and alignment between them (Reich & Benbasat, 2000). Formal lines of communication are often time-consuming and more suited for superior-subordinate relationships. For relationships between stakeholders of similar importance and for frequent interactions, communication channels should be more flexible and informal.

This was evident in the case as the HRD-IT used the formal line of communication via the Project Manager (Lead) to update the Steering Committee. In contrast, they used both formal (i.e. meetings) and informal (i.e. e-mail, telephone or face-to-face visits) lines of communication when dealing with the HRD-Users, for a more flexible and comfortable working relationship between them.

The final issue is the use of IT to support the inter-stakeholder knowledge sharing environment. Examples of such IT include networks and other technologies to connect various stakeholders (Henfridsson & Holmstrom, 2002). These technologies are the underlying foundation of inter-stakeholder knowledge sharing, as they provide the physical environment that allows stakeholders to interact and share information.

This was evident in the case as simple technologies like e-mail were utilized to allow stakeholders to keep in touch and discuss the project. More specialized technologies, like an internal document warehouse, were also utilized to facilitate the storage of documents, such as the project plan and minutes of meetings, in a common location that was easily accessible by all the relevant stakeholders.

5.3.4 Stakeholder Management Model

In summary, stakeholder management is a crucial yet under-researched step of the stakeholder analysis process. From the case study, three main areas that were important to the stakeholder management process were identified (see Figure 14). After the

stakeholder prioritization process, the first step involves the formation of a well-balanced and flexible mix of the relevant project stakeholders.

Then, the organization should manage the project stakeholders by simultaneously facilitating their inter-stakeholder relationships and knowledge sharing efforts. This is the final piece of the stakeholder analysis puzzle, as effective stakeholder management, based on a thorough stakeholder identification and prioritization process, may give organizations a greater chance of achieving ES implementation success.

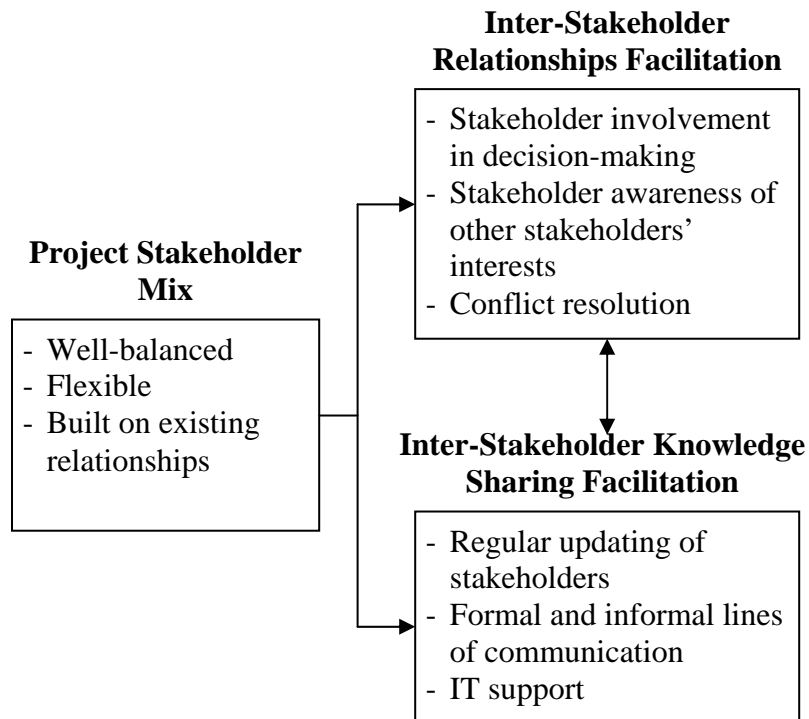


Figure 14: Stakeholder Management Model

5.4 Summary

Research Questions	Findings
Stakeholder Identification	Key activities identification.
	Relevant stakeholder involvement identification.
	Relevant inter-relationships identification.
Stakeholder Prioritization	Stakeholder legitimacy characteristics.
	Stakeholder Level A sources of power.
	Stakeholder Level B sources of power.
Stakeholder Management	Project stakeholder mix
	Inter-stakeholder relationships facilitation.
	Inter-stakeholder knowledge sharing facilitation.

Table 13: Case Study Findings

The findings of this case shed some light on the three areas of stakeholder analysis of ES projects (see Table 13). The first area is the identification of all the relevant stakeholders of the project that organizations have to deal with. Then, given the number of stakeholders, the next area is the prioritization of the more important stakeholders from the rest. The final area is how stakeholders should be managed to maximize their contributions to the project. Putting these three sets of findings together, we have a more comprehensive stakeholder analysis model for ES implementations (see Figure 15).

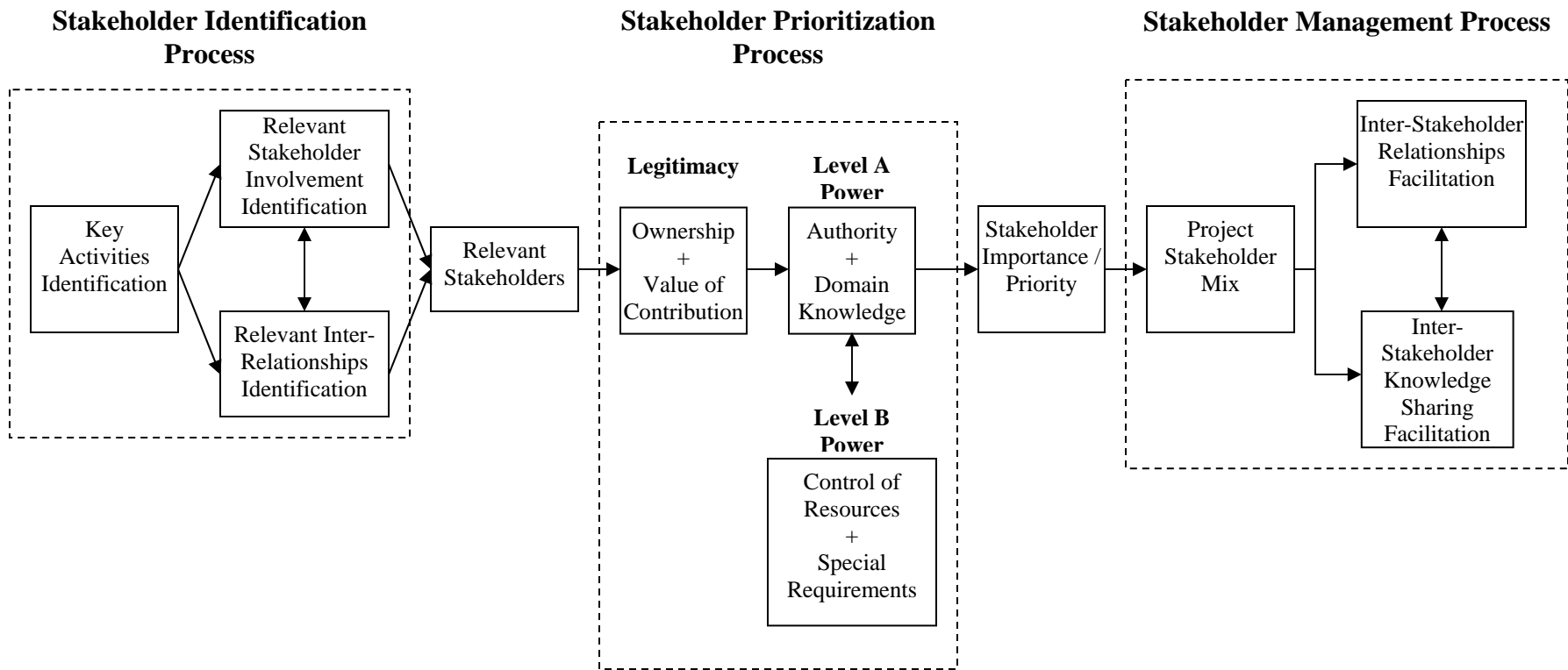


Figure 15: Stakeholder Analysis Model of Enterprise Systems Implementations

Chapter 6

Conclusion

6.1 Summary

Enterprise Systems are an integral part of organizations today, as they are the price of entry to do business in today's economy (Kumar & van Hillegersberg, 2000). ES have evolved from Enterprise Resource Planning (ERP) systems to include all types of integrated, enterprise-wide systems with centralized databases, such as Customer Resource Planning (CRM) and Supply Chain Management (SCM) systems. Despite the benefits of ES though, many organizations are still hesitant to or face problems when implementing them as they remain high-risk projects (Parr & Shanks, 2000).

A stakeholder perspective of ES using Stakeholder Theory can potentially minimize these risks by helping organizations better understand the numerous stakeholders involved in ES projects, as efficient identification (Papazafeiropoulou et al., 2002) and management (Wolfe & Putler, 2002) of these stakeholders can help to align the system with stakeholder needs, thus increasing the project's likelihood of success. Thus far though, this theory has not sufficiently been applied to the study of ES implementations (Pouloudi, 1999). This study aims to bridge this gap in ES implementation literature with a case study of an ES project from a stakeholder perspective.

This study was divided into two parts. Firstly, a literature review of previous studies on Enterprise Systems and Stakeholder Theory, and how the latter can be applied to the study of the former, was conducted. Secondly, a qualitative, interpretive case study of a university's ERP implementation was conducted over a period of six months. Finally, several research findings were made with regards to the three initial research questions.

The first finding was with regards to the identification of stakeholders. With respect to this question, a model was developed to showcase the identification process of the relevant stakeholders of ES projects. This model bases the identification of stakeholders on the key activities in each phase of the ES project, as per Markus & Tanis (2000)'s model. In addition to the interests of each stakeholder in each activity, the scope of their inter-relationships should also be identified (Friedman & Miles, 2002). Based on this information, the list of relevant stakeholders can be identified.

The next finding is with respect to the prioritization of stakeholders, which highlights the more important stakeholders in each phase of the ES project, as recommended by Starik (1994). Again, a model was developed to showcase the prioritization process of the more important stakeholders of ES projects based on six distinct characteristics that can be used to differentiate between these stakeholders. These characteristics are further divided into three categories, according to their role in the prioritization process.

In the stakeholder legitimacy category, the two characteristics identified were ownership and value of contribution. In the main level A power category, the two characteristics

identified were authority and domain knowledge. Finally, in the supplementary level B power category, the two characteristics identified were control of resources and special requirements. Together, these three categories help to pinpoint the more important stakeholders at any phase of the project so that the organization can focus on them, as advised by Wolfe & Putler (2002).

The final finding is with respect to the management of stakeholders, which is an important yet under-researched aspect of stakeholder analysis (Jawahar & McLaughlin, 2001) of ES implementations. Again, a model was developed to showcase stakeholder management based on three findings from the study. Firstly, the study showed that the first step in stakeholder management should be the formation of a well-balanced and flexible mix of the relevant project stakeholders. Next, since stakeholder relationships during ES projects exist in a network of influences that cause stakeholders to have direct relationships with each other (Rowley, 1997), there should be the facilitation of smooth inter-relationships between these stakeholders. Finally, given the convergence of the different knowledge domains of stakeholders, an environment should be facilitated in which these stakeholders are able to engage in efficient knowledge sharing, as proposed by Baskerville et al. (2000).

6.2 Research Contributions

The findings of this study are relevant to both researchers and managers. To researchers, the findings of this study give them some insight into the impact of stakeholders on ES implementations thus opening up various avenues for future research to further their

understanding of this under-researched area of ES. As for managers, this study gives them a practical starting point from which to identify and understand their stakeholders.

6.2.1 Contributions to Theory

With respect to the first research question, this study emphasizes the importance of stakeholder identification as a crucial first step towards stakeholder analysis. It addresses the limitations of past literature that only identify a few stakeholders that are studied independently. In contrast, this study argues for the need to identify all the relevant stakeholders such that they can then be studied as a whole, so that they do not miss out on important stakeholders or minimize their contributions to the project.

This study also proposes that researchers should not stop at identifying their relevant stakeholders. Instead, they should also study the inter-relationships between these stakeholders, as these inter-relationships can have an impact on why certain stakeholders act in certain ways.

Finally, this study addresses a gap in past literature, which focuses on the identification of stakeholders from an organizational perspective. In contrast, this study argues that researchers should consider the views of all stakeholders during the identification process, as different stakeholders may have their own perspectives on who the relevant stakeholders of the project are.

With regards to the second question, the model by Mitchell et al. (1997) was utilized for the stakeholder prioritization process. This study builds on this model, making it more applicable to research on ES implementations. Firstly, the study finds that their attribute of urgency does not necessarily apply to the study of ES projects, as it overlaps with the attributes of power and legitimacy.

Next, this study expanded on the attributes of legitimacy and power by incorporating six distinct characteristics that better help to differentiate between the stakeholders and give greater depth to these two attributes. Even so, these characteristics are by no means definitive as they are specific to the case that was studied. However, this revised model should still give researchers a better starting point from which to conduct further stakeholder analysis of ES implementations.

This study also supports the issue of stakeholder variance along the ES project life cycle. Current literature on the study of stakeholders tends to focus on their roles and contributions at specific instances of the ES project. Instead, this study posits that researchers should take into account the different needs at each phase of the project life cycle, and how different combinations of stakeholders are thus required.

With regards to the third research question, this study looks at stakeholder management, an area of stakeholder analysis that has thus been far received little attention in IS research. This study goes beyond just supporting the need for a well-balanced mix of ES

project stakeholders. It further uncovers the need for such consolidation to be flexible to cater to the dynamic needs along the different phases of the ES project life cycle.

Although literature does highlight the need to manage stakeholders as a network of inter-relationships, little work has been done on how this can be done or what aspects of these inter-relationships should be addressed. This study presents two possible avenues of research into this area.

Firstly, having identified the stakeholder web during the stakeholder identification process, researchers should utilize this web to analyze the inter-connections between stakeholders during the ES project life cycle, and see how these inter-relationships impact the contributions of stakeholders during the project.

Secondly, with regards to knowledge sharing among stakeholders, this study highlights the need for researchers to place greater emphasis on facilitating an environment in which stakeholders can proactively share knowledge for the greater good of the project.

Finally, past literature has focused on in-depth studies of the individual aspects of stakeholder analysis or broad overviews of the entire process. In contrast, this study's biggest contribution to theory is the development of a comprehensive stakeholder analysis model that is applicable to the ES implementations context. From an ES implementation perspective, this model bridges a gap in literature with regards to the study of the impact of the stakeholders on ES project success and how they should be

managed. Furthermore, from a Stakeholder Theory perspective, it takes the theory to the next level by presenting a comprehensive and detailed flow of the stakeholder analysis process, which can help researchers to study the practical use of this theory.

6.2.2 Contributions to Practice

This study also makes several contributions to the practical problems faced by organizations during ES implementations. In essence, this study emphasizes the need for organizations to go beyond focusing on technical issues surrounding their ES projects, to also consider the people factor, as greater understanding and management of these stakeholders can facilitate a smoother ES implementation process.

The first problem facing practitioners is identifying exactly who they have to deal with and include in their ES projects. This study emphasizes the need for organizations to draw up a comprehensive list of all relevant stakeholders of the ES project and their interests, no matter how minor their involvement could be. They should then ensure that each stakeholder is incorporated into the project in one way or another so that all their interests can be accommodated as much as possible. This ensures that the organization does not miss any issues that could potentially impact the implementation and utilization of the system. In addition, it is more prudent for organizations to incorporate the views of other stakeholders during stakeholder identification, instead of solely relying on management's perspective, to avoid missing out on any potentially relevant stakeholder.

Furthermore, organizations should note that the stakeholders of ES projects do not exist in isolation, as they have to work closely with one another to fulfill their roles and responsibilities during the project. Thus, in addition to identifying all the relevant stakeholders and their interests, organizations should also identify the inter-relationships between them. This would give them a holistic picture of how exactly stakeholders work with and influence one another. This will allow managers to better manage their stakeholder simultaneously as a whole.

Having identified all the relevant stakeholders, organizations will inevitably face the problem of trying to juggle the demands of all these stakeholders. This study presents a model to facilitate the process of prioritization of these stakeholders so that the organization can then focus their attention on their more important stakeholders. This model is based on six stakeholder characteristics, but while organizations should base their prioritization of their stakeholders on the three categories identified in the model, they can modify the specific characteristics used in the analysis as necessary to suit their specific organizational needs.

Most importantly, managers should be aware that these characteristics and the importance of the stakeholders, is not fixed. Rather, they vary during the course of the different phases of the ES project life cycle. Hence, organizations should be aware that they need to identify and prioritize their stakeholders separately in each phase, and not assume that having done so at the start of the project, they can proceed to manage their stakeholders in the same way throughout the project.

Once organizations understand the stakeholders involved in their ES implementations, the final contribution of this study is towards how these stakeholders can be managed. Firstly, this study encourages managers to pay greater attention to the mix of project stakeholders to ensure that they are representative of the four main categories of ES project stakeholders. Furthermore, managers should develop a core team of stakeholders, and add-on the remaining stakeholders as and when they are needed. This helps to streamline the stakeholders' involvement, minimize the stakeholders who are involved at any one time, and minimize the time and resources that each stakeholder needs to contribute to the project at any one time.

Next, as mentioned earlier, managers should be aware of the interplay of interactions between stakeholders. Instead of micro-managing their relationships, managers should look to ways of creating an environment in which stakeholders have minimal problems in interacting with one another. One example is the setting up of a clear conflict resolution hierarchy and guideline so that stakeholders can resolve their own conflicts instead of bringing every issue up to top management, or worse still, ignoring these issues and letting them fester until they become detrimental to the project.

Similarly, managers should also create a conducive environment in which stakeholders can share knowledge with one another. As mentioned earlier, different stakeholders bring different sets of domain knowledge to the table during the project. As such, it is important for them to be able to share this knowledge with other stakeholders so that

everyone can perform their role optimally. However, given the diverse sources of knowledge, it would be more efficient for facilitate a setting in which stakeholders are willing and able to share their knowledge, rather than having the organization manage each and every transfer of information.

6.3 Future Research

Based on the findings of this study and the contributions to researchers, several potential avenues for future research are proposed that build on the work done in this study. One such area is a multiple-case study involving a variety of other types of ES projects, such as CRM and SCM projects, to facilitate the triangulation of research findings towards developing a holistic model that is generally applicable to all ES projects.

Another future area of research is to empirically test the model developed in this study, for example with a survey of each of the attributes identified in the model. This will enable researchers to test the validity of the model and hence fine-tune it accordingly towards developing a more comprehensive model that can be used in future stakeholder analysis of ES projects.

A third area of research is to conduct longitudinal studies of ES projects from the planning to the post-implementation phases. This will give greater insight into how stakeholders vary during the course of the ES project life cycle and hence how they should be handled in each phase.

A fourth area of research is on the role of different stakeholders along the various phases of the ES project life cycle. This study could develop a list of the common activities in each phase of the cycle. The study can then identify the contributions required for each activity. This can serve as a blueprint for the identification of the relevant stakeholders who can fulfill these contributions.

This study has focused largely on the analysis of stakeholders during the course of an ES project. It would probably prove interesting for future studies to also analyze the needs, impact and management of stakeholders during post-implementation, when the project is basically over, the project team disbanded and normal operations have resumed in the organization. How does the management of stakeholders in such low-key periods compare to their management during high-key project periods?

Another area of research is with regards to stakeholder prioritization. This study supplies a list of six variables that can help to differentiate between the stakeholders of ES implementations. Further studies can look into validating this list, and either adding or subtracting from it, such that a more comprehensive list of variables can be developed, which can help facilitate stakeholder prioritization.

Research can also be conducted on project stakeholder mix. Given the numerous stakeholders involved in ES projects, future studies can work on developing a blueprint for flexible mixtures of project stakeholders. These studies can look into who should constitute the fixed component, and who should constitute the variable components, as

well as how these variables components can most effectively be connected and disconnected from this mix.

There can also be research into the area of stakeholder inter-relationships. Given the complexity of stakeholder inter-relationships and the need for organizations to facilitate the interactions amongst their stakeholders, research can be conducted into how this can best be achieved. It can look into the factors that have an impact on stakeholder inter-relationships, and how organizations can manage these issues.

Research can also be conducted into the area of knowledge sharing. Such research can be conducted into the use of stakeholder theory to facilitate the identification and prioritization of the stakeholders who possess the necessary knowledge required for ES projects. From there, studies should also look into how such stakeholders should be managed to facilitate their ability and willingness to share their knowledge at each phase of the ES project life cycle, for the ultimate benefit of the project.

In addition, research can also be conducted into the general area of stakeholder management. In addition to the three issues identified in this study, namely stakeholder mix, inter-relationships and knowledge sharing, future studies could look at ongoing or past ES projects and see how organizations have managed their different stakeholders. What makes the involvement of these stakeholders during ES project unique as compared to other IS projects? Furthermore, what makes the management of these ES project stakeholders different from normal IS stakeholder management?

With the groundwork laid by this study as to how stakeholders during ES projects can be identified and prioritized, to facilitate their management, future research can also focus on how such stakeholder analysis actually impacts on ES implementation success. To what extent does stakeholder analysis play a part in improving the success of ES projects? Furthermore, what aspects of stakeholder analysis are specifically important in contributing to this success?

Finally, given that the stakeholders involved in ES projects generally have their own interests, and their primary aim is usually first and foremost to fulfill these needs, another interesting line of research would be to look at what exactly the stakeholders of ES projects do to ensure that their needs are fulfilled. This can give greater insight into why stakeholders act the way they do during ES projects, and subsequently, how this affects the way they should be managed.

6.4 Limitations of Research

This study faced two main limitations, which should be taken into account when applying its findings. Firstly, this study's findings are neither representative nor generalizable to the entire spectrum of ERP, much less ES, implementations, as the study was limited to a single-case study of two phases of the ES project life cycle. This limitation can be overcome by conducting multiple studies of different ES projects to test the validity of this study's findings.

A second limitation of this study was the heavy dependence on interviews and documentation. This is largely second-hand information that though informative, can only provide so much information, especially when it comes to the analysis of stakeholder interactions. Further research into a stakeholder perspective of ES projects should incorporate other data sources, such as direct observations of meetings between various combinations of stakeholders at different phases of the ES project life cycle, as this may provide greater insight into how these interactions vary.

Chapter 7

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Appendix A

Case Study Protocol

A.1 Introduction

The purpose of this case study protocol is to provide an overview of how this case study was conducted. By documenting this information, the researcher hopes to guide any researcher to duplicate a similar study under similar circumstances, thus increasing the reliability of this study.

This study uses Stakeholder Theory to look at the role and impact of the individuals and groups involved in Enterprise Systems implementation. In particular, this study looks at three research questions:

1. How can the stakeholders of an ES implementation be identified? (Stakeholder identification)
2. How can the important stakeholder of an ES implementation be differentiated? (Stakeholder prioritization)
3. How can the different stakeholders be managed? (Stakeholder management)

The case selected for this study is a department in a university, which began implementing a new Enterprise Resource Planning (ERP) module in March 2003. This study will initially cover the first two phases of this project, with an eye towards studying

the remaining phases of the project through to its completion and post-implementation. This case involves a total of eleven stakeholders.

Data collected for this study comes from two sources, documentation and interviews. The documents reviewed include the project plan and minutes of meetings. These documents give background information on the project and how it was initiated, as well as details regarding the interactions between the various stakeholders involved in the project.

The interviews were conducted with select people from as many different stakeholder groups as possible and necessary. Such a diverse base is important so as to provide the researcher with as many different perspectives as possible regarding stakeholder roles, impact and interactions during the course of this project.

A.2 Briefing the Interviewee

Before beginning the interview, it is necessary to reiterate several things regarding this study (in addition to the normal information such as ensuring confidentiality and seeking permission to record the interview):

- Given that the university has and is engaged in several ERP projects, it should be reiterated that the focus of the interview is on the SAP TM module, which is the focal point of this study.
- Also, given that the interviewees have a tendency to generalize their comments based on their overall project experiences, the interviewer should remind the interviewee to focus on just the first two phases of the project for all of the questions below.

- Furthermore, the interviewee should look at each phase separately and not generalize their opinions across both phases.

A.3 Interview Questions

1. Background information

- a. Full name**
- b. Official appointment**
- c. Number of years of having held this appointment**
- d. Contact information**

Question 1 provides some demographic information about the interviewee.

2. How much do you know about the proposed system?

3. What is the scope of your involvement in this project?

- a. In what ways do you think you can affect or be affected by the project?**
- b. How was your input into the project sourced and handled?**

Questions 2 and 3 are meant to start them off on something familiar (i.e. their general impressions of the proposed system and their involvement in the project) before exploring the three research questions per se.

4. In your opinion, who are the other individuals/groups who can affect or be affected by this project (Appendix A)?

- a. Is there anyone else in addition to those listed in the appendix?**
- b. How can this individual/group affect or be affected by this project?**
- c. How is input from this individual/group sourced and handled?**

Question 4 looks to build a comprehensive list of the stakeholders involved in the project. It also looks at how stakeholders are identified as being relevant to the project.

- 5. How would you describe your relationship with each of these individuals/groups?**
 - a. In what ways (if any) do you interact with them?**

Question 5 looks to build a stakeholder network for this project by identifying the interactions (both present and absent) between the stakeholders involved in the project.

- 6. How important do you consider each of these individuals/groups to the project?**
 - a. Why do you consider this individual/group important?**
 - b. What factors/characteristics affect the level of importance of this individual/group to the project?**
 - i. Why does this factor/characteristic affect the level of importance?**
 - ii. How does this factor/characteristic affect the level if importance?**

Question 6 looks at who the more important stakeholders of the project are and why. If necessary, the interviewer can give several common factors as examples, such as power,

legitimacy or urgency, to get a discussion started if the interviewee is unable to think of any particular factors.

7. Does the importance of a group vary during the course of the project?

a. In what ways does it vary?

Question 7 gives insight into the dynamic nature of stakeholder importance during the project.

8. Does the difference in importance of each individual/group affect their involvement in the project?

a. Does it affect the way you work with them and handle their contributions to the project?

i. Why does it affect the way you interact with them?

ii. How does it affect the way you interact with them?

b. Does it affect the way the other individuals/groups involved in the project work with them and handle their contributions to the project?

i. Why does it affect the way they interact with them?

ii. How does it affect the way they interact with them?

Question 8 looks at how stakeholder importance affects stakeholder interactions during the project and how a stakeholder handles others who are of differing importance.

A.4 List of Stakeholders

1. Steering Committee
2. Lead Project Managers
3. User Project Manager
4. User Lead
5. HRD-Users
6. HRD-IT
7. SAP Lead Consultant (SAP-LC)
8. Development Team
9. Computer Department
10. Policy Makers
11. University Staff (i.e. from other faculties and departments in the university)

Appendix B

A Sample of the Three-Step Thematic Analysis

B.1 Sample Thematic Analysis: Step One

In this step, key statements from each transcript and document are highlighted.

Interviewee	Statement
Interviewee #1	The HRD-Users are important as they run the system operationally daily.
	The Project Manager (Lead) did not meet all the University IT staff, but did correspond with all by e-mail or phone.
	The Project Manager (Lead) has formal meetings with other stakeholders.
	We need to sit with HRD-Users and plan before implementing anything.
Interviewee #2	The decision to go ahead with this project was only made after the HRD-Users were comfortable with it.
	The HRD-IT is important as they assess whether certain things are technically possible.
	The Project Manager (User) facilitates discussion between the HRD-Users and HRD-IT.
	The Steering Committee has the final say.

Interviewee #3	Documents are put on Web share point so the HRD-Users can verify.
	If the HRD-IT wants anything from users, they go through the Project Manager (User).
	The Project Manager (Lead) seeks the HRD-IT's input on documents as he's unfamiliar with leave system and business rules.
	We need to inform and discuss with other departments on changes if changes affect their systems (since systems are inter-linked).
	When changes come from the top, they have to do it.

B.2 Sample Thematic Analysis: Step Two

In this step, each statement is given a label.

Label	Statement
Authority	The Steering Committee has the final say.
	When changes come from the top, they have to do it.
Decision-making	The decision to go ahead with this project was only made after the HRD-Users were comfortable with it.
	We need to inform and discuss with other departments on changes if changes affect their systems (since systems are inter-linked).
	We need to sit with HRD-Users and plan before implementing anything.
Domain knowledge	The HRD-IT is important as they assesses whether certain things are technically possible.
	The HRD-Users are important as they run the system operationally daily.
	The Project Manager (Lead) seeks the HRD-IT's input on documents as he's unfamiliar with leave system and business rules.
Formal communication	The Project Manager (Lead) has formal meetings with other stakeholders.
	If the HRD-IT wants anything from users, they go through the Project Manager (User).
	The Project Manager (User) facilitates discussion between the HRD-Users and HRD-IT.

Use IT	Documents are put on Web share point so the HRD-Users can verify.
	The Project Manager (Lead) did not meet all the University IT staff, but did correspond with all by e-mail or phone.

B.3 Sample Thematic Analysis: Step Three

In this step, the labels are grouped into themes.

Theme	Label	Statement
Stakeholder characteristics	Authority	The Steering Committee has the final say.
		When changes come from the top, they have to do it.
	Domain knowledge	The HRD-IT is important as they assesses whether certain things are technically possible.
		The HRD-Users are important as they run the system operationally daily.
		The Project Manager (Lead) seeks the HRD-IT's input on documents as he's unfamiliar with leave system and business rules.
Build stakeholder acceptance	Decision-making	The decision to go ahead with this project was only made after the HRD-Users were comfortable with it.
		We need to inform and discuss with other departments on changes if changes affect their systems (since systems are inter-linked).
		We need to sit with HRD-Users and plan before implementing anything.
Inter-stakeholder knowledge sharing	Formal communication	If the HRD-IT wants anything from users, they go through the Project Manager (User).
		The Project Manager (Lead) has formal meetings with other stakeholders.

		The Project Manager (User) facilitates discussion between the HRD-Users and HRD-IT.
	Use IT	Documents are put on Web share point so the HRD-Users can verify.
		The Project Manager (Lead) did not meet all the University IT staff, but did correspond with all by e-mail or phone.

Appendix C

A Sample Codebook

C.1 Code Number One

Element	Content
Label of theme	Domain knowledge
Definition of what it concerns	A statement that indicates that a stakeholder is handled or seen differently because he has unique knowledge that is not possessed by other stakeholders.
Description of how to identify it	Look for phrases that indicate knowledge or experience. Look for phrases that indicate that a particular reaction is due to the presence of this knowledge.
Examples	“X seeks Y as he’s unfamiliar with the business rules.” “X does the configuration, as he’s more familiar with it.”

C.2 Code Number Two

Element	Content
Label of theme	Use of IT
Definition of what it concerns	A statement that indicates that IT is used in some way during the course of stakeholder interactions.
Description of how to identify it	Look for phrases that talk about IT. Look for phrases that indicate that a stakeholder uses this IT during the course of his interaction with another stakeholder.
Examples	“Documents put on a Web share point so users can verify.” “Did correspond with all the staff by e-mail.”