An Examination of the Role of Corporate Governance Structure in the Implementation of Enterprise Resource Planning (ERP) Systems: An International Perspective

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Dissertation prepared for the degree of:
Doctor of Philosophy

University of North Texas
August 2015

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Obitade, Oluseyi Peter. *An Examination of the Role of Corporate Governance Structure in the Implementation of Enterprise Resource Planning (ERP) Systems: An International Perspective*. Doctor of Philosophy (Information Science), August 2015, 101 pp., references, 162 titles.

Enterprise resource planning (ERP) systems are regarded as among the most innovative information technology products developed over the past two decades. Thus, they have become the backbone of management information systems in the organizations that have implemented them. The difficulties associated with their high failure rate, however, have been the subject of extensive studies. To expand on this knowledge, this study has two research objectives: to examine the relationship between corporate governance structures and implementation results and to investigate whether implementation outcomes vary by country. This study focuses on the project steering committee's involvement, internal auditors' participation, and the change management plan implementation. The results demonstrate that steering committee involvement is a primary factor that influenced the success of ERP implementation; and that institutional factors in country of deployment are important determinants of ERP project outcome.

Dedication

To Mom: You always taught me to believe in myself and never give up. Without your encouragement this work would only be a dream.

To Dad: You did not live to witness this accomplishment, yet your knowledge and wisdom still guided me. I heard your encouraging words at every stage. I love you and I miss you.

To my dearest wife: Thanks for your understanding, encouragement, and patience. Your support and love made this accomplishment possible. I love you.

To my children (Dorcas, David, Daniel and Deborah): You are all blessed children

To Holy Trinity: I dedicate this study to God the Father, God the son, and God the Holy Spirit. Specifically to my Lord Jesus Christ who died for me on the cross and in whom I live, in whom, I move and whom, I have my being.

Last, special thanks to Dr. Maurice Wheeler, Dr. Tomas Mantecon and Dr. Chang Koh for their support and encouragement.

THE LORD REGINETH. AMEN

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CHAPTER 1: Introduction

The highly publicized financial reporting fraud cases at companies such as Enron, WorldCom, Tyco, Adelphia, and Global Crossing have reinforced the need for an effective corporate governance monitoring mechanism. Previous studies that have examined the issue of corporate governance have advocated the use of information systems to address some of the perceived conflicts of interest between principal entities and agents. Specifically, discussions about strengthening corporate governance, viewed as agency conflicts, have centered on the use of information systems to bridge the information gaps between owners and managers of corporations. Enterprise resource planning (ERP) systems are regarded as among the most innovative information technology products developed over the past two decades. Thus, they have become the backbone of management information systems in the organizations that have implemented them. The difficulties associated with their high failure rate, however, have been the subject of extensive studies (Scott and Vessey, 2002; Al-Mashari, 2000; Davenport, 1998; Wanga et al, 2007). Factors affecting ERP implementation are complex and prior studies have identified elements that are essential to its success. To expand on this knowledge, this study has two research objectives: to examine the relationship between corporate governance structures and implementation results and to investigate whether implementation outcomes vary by country. In this study, the project steering committee's involvement, internal auditors' participation, and the change management plan are the three empirical indicators of governance structures that are considered primary factors that influence the success of ERP implementation.

Corporate governance examines the issues related to the defense of shareholders' interests. It addresses issues regarding the separation of ownership and control between a principal (shareholder) and agent (manager or entrepreneur). This relationship is described in the

corporate governance literature as an agency conflict. The agency theory has identified two problems that can occur in an agency relationship: conflicting goals of principal and agent and the principal's difficulty in verifying the agent's activities (Jensen & Meckling, 1976). Specifically, the main problem in the agency relationship is that, due to costs and other issues, the principal cannot conveniently confirm that the agent is pursuing interests that are consistent with its fiduciary obligations (Eisenhardt, 1989). In other words, according to Jensen (1986), managers' interests might not be aligned with those of shareholders. Consequently, managers might waste free cash flow on unprofitable investments.

In the corporate governance literature, information is regarded as a commodity that has costs and can be purchased. Hence, formal information systems are needed to capture and process relevant business information. Consequently, firms can invest in information systems to monitor control agent activities. Eisenhadt (1989) argued that good information systems can control managers' opportunistic tendencies, thereby helping to align managers' interests with those of shareholders. ERP systems may be the most significant development in the corporate use of information technology; they can be seen as the backbone of management information systems in the organizations that have implemented them.

Prior to the introduction of ERP systems, companies had to develop custom software that was expensive to design and maintain. Moreover, after implementing these systems, most of the programmers who design them must be retained to maintain these highly customized systems. Similarly, project time lines were dragged out because managers often could not communicate clearly their business information needs. In addition, many companies had systems designed specifically for each department (or product line systems), with no functionalities to share information across the enterprise, and thus the systems became "information silos" within the

organization (Bradford & Florin, 2003). This information fragmentation resulted in data discrepancies and a lack of timely information crucial for effective decision making. Consequently, organizations resorted to the development of complex interfaces to transfer data from one system to another.

To address these challenges, a new generation of information systems, called enterprise resource planning, was developed. Unlike the earlier (legacy) systems, ERP applications provide an integrated source of data for different functional areas, including production planning, accounting, sales and distribution, supply chain management, and materials management. A unique feature of ERP systems is that they are based on table-driven customization instead of the hard-coded program logic of legacy systems. These features allow ERP systems to be rapidly implemented and tested (Oliver & Romm, 2002). ERP vendors include SAP, Oracle, PeopleSoft, JD Edwards, Salesforce.com, Baan, Microsoft, and HP.

ERP implementation is an expensive initiative for organizations. The cost of ERP systems ranges between $15 million and upwards of $100 million for multinational corporations (Davenport, 1998), while the implementations takes, on average, 21 months to complete (O'Leary, 2000). In addition, substantial annual costs are incurred to maintain and periodically update or reengineer these systems. Despite the huge investments of resources, problems associated with ERP implementations are vast and diverse. Some of the issues identified in previous studies include inappropriate scope, lack of adequate testing, data quality issues, and inadequate management support. In addition, the lack of top-level management support and the exclusion of lower level employees in the project decision-making process add to the complexity of ERP implementation. In most cases, top management reduces funds set aside for employees

and, coupled with employee resistance, this contributes to the failure of ERP deployment projects.

Among the ERP vendors, SAP AG, founded in 1972, provides the world's most widely adopted ERP software platform with 194,000 customers in more than 120 countries. ERP systems have grown in popularity since the 1990s, with estimated revenue of US $18 billion as of 2011 (SAP Newsletter, 2011). The integrated nature of ERP systems enables consistency and visibility of business processes across the enterprise (Rashid, Hossain, & Patrick, 2002). In other words, ERP systems provide an enterprise-wide platform that corporations deploy to run business operations and thus eliminate the need to develop in-house applications for different functional areas. The systems also offer easy-to-use graphical user interfaces designed to support employee and customer relationships. The SAP system provides integrated modules that cover virtually every aspect of business management, including human resources, finance, human resources, product lifecycle management, business intelligence, and supply chain management. Similarly, the integrated ERP platform helps organizations reduce the deployment time and budget for developing and testing the system components (Haag, Cummings, & McCubbrey, 2005). Because of these benefits, thousands of companies worldwide have implemented these systems. However, despite their adoption, relatively few companies have been able to implement them successfully. In fact, according to a survey conducted by Gartner, only 60% of companies implementing ERP systems claim to have obtained the expected benefits. In most studies, an ERP deployment effort is considered successful if the project is completed within budget and on time and meets business objectives, such as return on investment.

The Structure of Enterprise Resource Planning (ERP)

ERP systems integrate all functional areas of an organization into a single information system. Yusuf et al. (2004) reported three key benefits of ERP systems: timely access to business information, improvement in supply chains through the use of e-communication and e-commerce, and business process automation and improvements. When deployed appropriately, ERP software integrates information used by all areas of an organization into a single, integrated platform (Rajagopal, 2002). This provides a more effective and efficient system, which is crucial for business survival (see Figure 1).

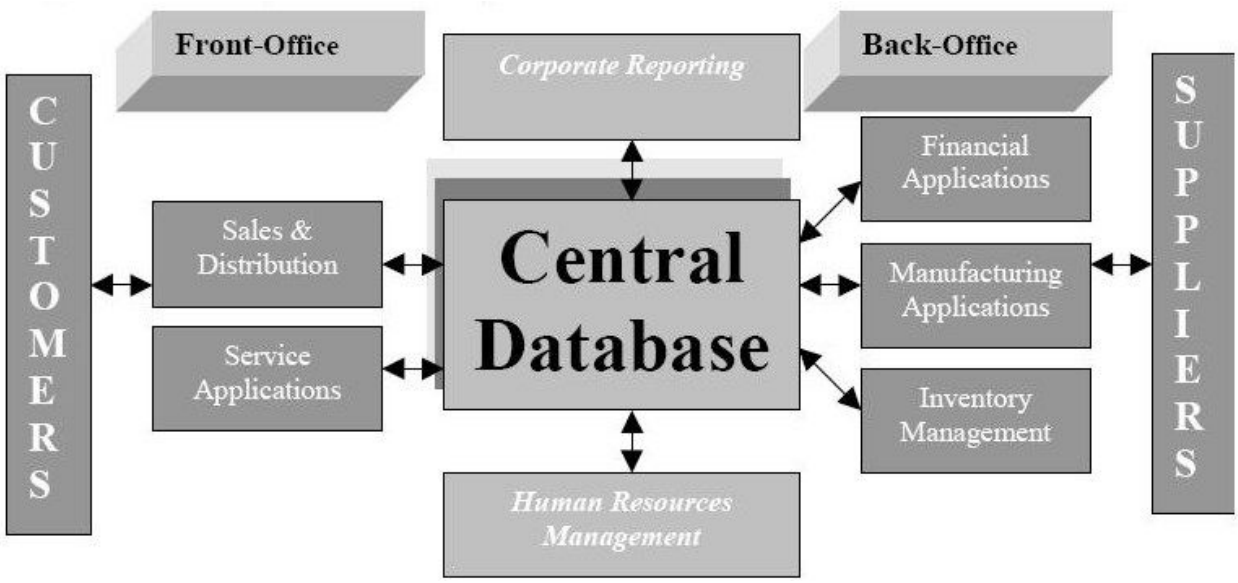


Figure 1: ERP systems concept. Source: Rashid, Hossain & Patrick (2002).

Statement of the Problem

Despite the importance of information systems as governance monitoring mechanisms (and the amount of resources invested in their implementations), the ERP deployment success rate is very low. The high failure rate has been a source of interest to both academics and

practitioners. For instance, Scott and Vessey (2002) reported that more than 90% of SAP implementations either late or over budget. In the same line of research, Al-Mashari (2000) documented that 70% of ERP implementations failed to deliver expected benefits. Many theories and approaches to ERP implementation have had both successful and unsuccessful results. Identification of the many critical success factors that underlie these approaches has been the objective of previous research efforts, which are considered in chapter 2. Despite these prior efforts, several factors affecting the international implementation and support of ERP systems have not been fully identified and described. Among those critical success factors mentioned in the literature, corporate governance is the focus of this study. Specifically, corporate governance is operationalized for this study as executive steering committee engagement, internal auditor involvement, and clearly defined (and implemented) corporate change management policies. The intent of this study is to identify, analyze, and investigate these (and other) factors that influence the deployment and support of ERP systems.

Rationale for the Methodology

Previous research has used various methods to collect data for academic studies. Research methods such as personal and telephone interviews and questionnaires were considered for this study. Because of constraints such as cost and time, the survey method using self-administered questionnaires was selected. One element of the study design addresses the issue of representativeness of the sample from the population. In addition to the survey questions, follow-up interviews will be conducted with randomly selected project managers and chief information officers (CIOs) to confirm assumptions and obtain additional information regarding their project experiences.

Research Questions

An ERP system is a costly, complex, comprehensive system which, when successfully implemented, can offer many potential benefits, including increased competitiveness and access to timely and accurate business information. These benefits, in turn, may lead to better decision making, better vendor relationships, and stronger customer loyalty (Oliver & Romm, 2002). Considering the high risk for failure observed across many unsuccessful ERP implementations, it is important to understand the factors that contribute to successful and unsuccessful implementations. With this in mind, the following questions will guide this study:

- What is the relationship between project steering committee (upper-level management representatives on the project) involvement and successful implementation of ERP Systems?
- How does the internal auditors' participation affect ERP implementation project outcomes?
- What is the importance of change management plan in an ERP implementation?
- Are ERP deployment outcomes vary by countries of origin of implementing firms? And if so, what are the contributing factors?

Rationale for the Study

Companies create competitive advantage through continuous improvement. The deployment of ERP systems, which support efficient and effective operations (by providing timely information that is directly related to business processes), has become a critical issue. Understanding the factors that affect ERP implementation is necessary for company executives

who plan to implement ERP systems; this understanding will help them anticipate problems they are likely to encounter during the implementation process. Thus, this study will aim to provide best practices to facilitate successful ERP implementation. This study will contribute to existing knowledge regarding critical success factors for ERP implementations:

- Being the first study (as far as I know) that examines the role of internal auditors in SAP ERP implementation
- Unlike prior studies that argued that top management support is necessary for successful implementation, this study looks at the nature of top management support by specifically examining the role of steering committee in the implementation process.
- The first study to examine critical success factors of ERP implementation from corporate governance perspective
- This study is also the first to investigate whether implementation success vary by country, and the impacts of other variables that are international in nature.

Definition of Terms

The following terms are used throughout the course of this research:

Corporate governance: is defined as the set of processes, laws, customs, policies by which corporations are administered and managed. Corporate governance also relates to the relationships between organization and internal and external stakeholders (Monks & Minow, 2011).

Change Management: is concerned with the process involved with the development of planned approach to change in an organization. It deals with the human aspect of organizational

change. The objective of change management is to maximize the benefits of change across organization and minimize the risk of failure of planned change.

Competitive Advantage: examines the mechanism used by organization to produce product or service in a way that customers value more than what the competition is able to do (Haag et al., 2005).

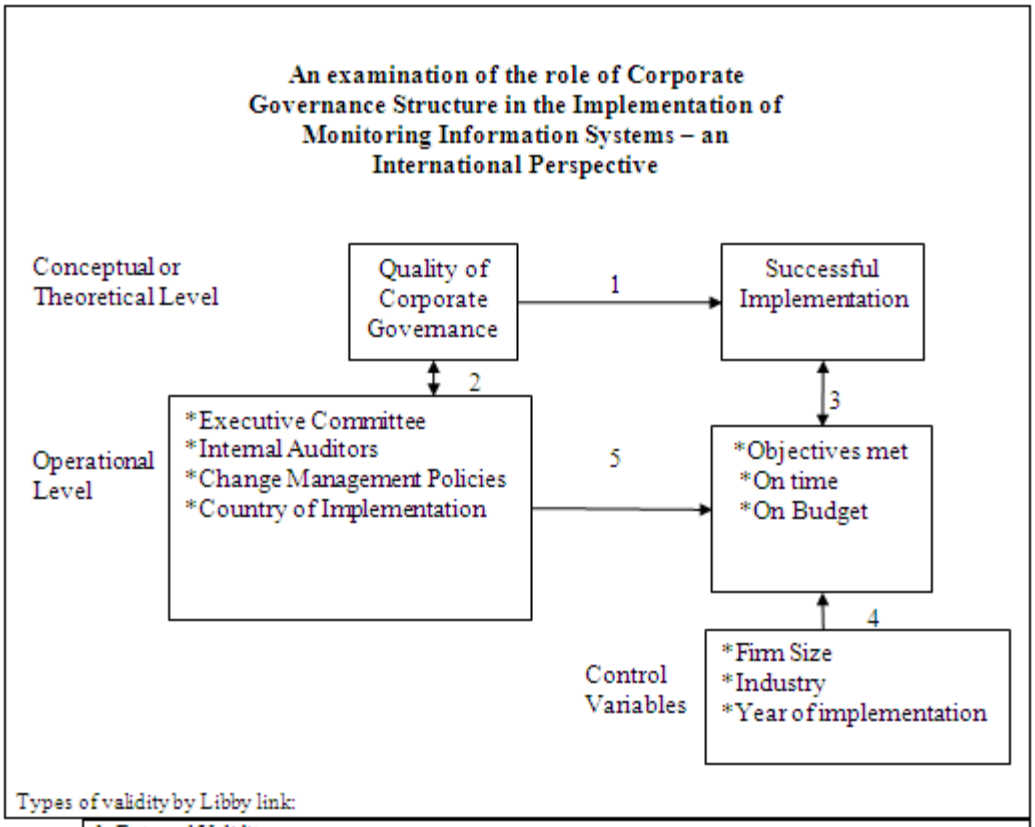
Critical Success Factors (CSFs): Factors critical to the success of a project or organization (Haag et al., 2005).

Enterprise Resource Planning (ERP): ERP system that provides organization with an integrated information system to process transactions among the different areas within an organization, and between companies and their customers and vendors (Davis & Heineke, 2005).

Supply-Chain Management (SCM): A system that primarily focuses on how firms interact and communicate with the suppliers as part of overall supply chain strategies, with the aim of providing firm and customers with high-quality products and services that are competitively priced (Davis & Heineke, 2005).

Organization of the Remainder of the Proposal

This study is international in scope. Specifically, the paper will investigate whether implementation success varies by countries. If the results support the international perspective, I will examine the contributing factors. In addition, countries with high failure rates will be identified and an indepth analysis performed to understand specific reasons. Building on the introduction in chapter one, chapter two explores the literature on corporate governance, change management, Internal Auditor and global implementation strategies and challenges. Chapter three introduces the research methodology employed in this study.


An examination of the role of Corporate Governance Structure in the Implementation of Monitoring Information Systems – an International Perspective
Conceptual or Theoretical Level
Quality of Corporate Governance
1
Successful Implementation
2
3
Operational Level
*Executive Committee
*Internal Auditors
*Change Management Policies
*Country of Implementation
5
*Objectives met
*On time
*On Budget
4
Control Variables
*Firm Size
*Industry
*Year of implementation
Types of validity by Libby link:
1. External Validity
2. Construct Validity
3. Construct Validity
4. Internal Validity
5. Statistical Validity

CHAPTER 2: Literature Review

Corporate Governance

The corporate governance literature has largely focused on agency conflicts between shareholders and managers. The origin of agency problem is the separation of ownership and control of corporations. In most business ventures, an entrepreneur raises funds from investors to finance business operations because he might not have sufficient capital of their own to invest. On their parts, the suppliers of capital need the manager's business knowledge and experience to generate returns on their investments. An agency problem arises because of the difficulties financiers have in adequately monitoring the managers to ensure that their funds are not wasted on unprofitable projects. A large stream of literature has examined issues surrounding agency conflicts (Coase, 1937; Jensen and Meckling, 1976; and Fama and Jensen, 1983a, b; Shleifer and Vishny, 1997). While some studies have focused on disclosure to shareholders, other has examined the relationship between the Chief Executive Officer (CEO) and board of directors. Specifically, these studies have investigated the internal (private) communication between the CEO and board of directors which is not for public consumption. Hermalin and Weisbach (2003) and Hermalin (2005) argued that the effectiveness of the board depends on its independence from the CEO. They suggested that the board must be sufficiently independent to effectively perform its monitoring role and other responsibilities, such as the hiring (and firing) of the CEO. In their study, Song and Thakor (2006) indicated that the CEO and board both have career concerns can render even an independent board ineffective in its monitoring role.

Prior Studies on Internal Monitoring Mechanism

Previous studies have documented the prevalence of managerial behaviors that do not serve the interests of investors (Jensen & Meckling, 1976; Fama & Jensen, 1983a, b). To resolve the apparent conflicts of interests, prior literature has argued that stockholders rely on both internal and external mechanisms to monitor manager's activities. One such control mechanism is the board of directors. The board is selected to represent the interests of shareholders and has primary responsibilities for monitoring and disciplining of managers. The board is considered an important internal control mechanism, while institutional investors and the takeover market are sources of external control. Jensen (1986) argued that certain characteristics are essential for a board to be effective as a corporate governance mechanism. For example, a corporate board should be small and dominated by outside directors. In addition, managers and directors should own a substantial equity stake in the company. Jensen also argued that external monitoring mechanisms—including legal, regulatory, and product markets—should supplement internal monitoring mechanisms to have an effective control mechanism. Huson et al. (2001) examined the effects of recent changes in control mechanisms on monitoring quality. These authors argued that despite substantial improvements in internal monitoring mechanisms over the past two decades, there has been no significant change in the number of top executives forced to turn-over power based on poor company performance.

Research Literature on ERP Implementation

In the past two decades, companies worldwide have implemented enterprise resource planning (ERP) Systems. ERP systems are a new generation of information systems that enables companies to integrate their business processes and all the information relevant to their

organization. There has been extensive research on the benefits and challenges of ERP implementations. Specifically, prior studies have demonstrated that despite the promise of ERP systems, these systems have proven “expensive and difficult to implement, often imposing their own logic on a company's strategy and exiting culture” (Umble et al. 2003, p. 251). Academic literature has reported multiple examples of failed ERP projects. For instance, Davenport (1998) found that ERP implementation projects in companies such as Dell, Mobile Europe, and Fox–Meyer Drug failed to achieve project objectives. In their study, Volkoff and Sawyer (2001) reported ERP deployment failures at Hershey, Whirlpool, and Waste Management, Inc. Academic institutions such as the University of Massachusetts-Amherst and Indiana University have also experienced failure in their ERP deployment efforts in the form of project delays and cost overrun (Wanga et. al. 2007; Scott & Vessey, 2003). This study builds on that knowledge base, identifying factors that potentially affect ERP implementation and ultimately bringing together related factors in a model that provides a basis for the proposed methodology.

Brazel & Dang (2008) identified three areas of focus in prior research on ERP implementation: the analysis of critical success factors of ERP implementations, the financial implications of ERP implementations and the operational benefits of ERP implementations. The first stream of studies examined factors that positively influence successful implementation. The high failure rates of these systems that led to the interests by scholars to examine the critical success factors in the implementation of these applications.

Extant literature has documented the high failure rates of ERP implementation projects. Some of these studies have reported that between 50% and 70% of ERP system implementations globally experienced problems and failed to achieve project objectives (Shore, 2005; Wanga et. al. 2007; Scott & Vessey, 2003). Even firms that achieved technical success were unable to fully

garner the expected benefits from their ERP system deployments. One area of extensive study has been the high failure rate. Most of these studies attributed the failure rate to the failure on the part of implementing firms to put in place appropriate organizational changes that focus on critical success factors (Sadagopan, 1999; Scott & Vessey, 2000; Gowigati & Grenier, 2001; Kennerley & Neeley, 2001).

Finney and Corbett (2007) cited ERP implementation failure at Nike that resulted in a $100 million drop in quarterly profit. Other reported failures include that of Unisource Worldwide, Inc., which wrote off US$ 168 million when the company abruptly abandoned System Application Product (SAP) ERP implementation (Hayes, Hunton & Reck, 2001). Murray & Coffin (2001) reported that FoxMeyer Drug filed for bankruptcy protection due to ERP implementation failures. The company blamed the ERP system for its failure and filed a US$500 million lawsuit against the ERP vendor. They also reported that Dell abandoned its SAP ERP deployment project due to significant project delays and cost overruns. Furthermore, Dow Chemical wrote off nearly half a billion dollars due to challenges during its ERP implementation upgrade project.

Extending the literature further, Stratman and Roth (2002) analyzed implementation success through an ERP competence model. They reported that executive commitment and effective change management are essential for successful ERP implementation. Mabert et al. (2003) discovered that companies conducting extensive pre-implementation planning and relying less on system configuration were more successful with ERP implementation. Bradford and Florin (2003) found that employee training and competitive pressures are critical success factors in ERP implementation. Finally, Bancroft et al. (1998) identified critical success factors for ERP

implementation: a good communication mechanism with stakeholders, executive management support, effective project management, and the presence of a champion.

The second research area has examined the financial implications of ERP implementation on firms. To gain and maintain a competitive advantage in an increasing challenging global business environment, companies are turning to information systems to improve customer service, shorten cycle times, and reduce cost. Hitt et al. (2002) demonstrated that firms that invest in ERP reported higher financial performance. Wagner and Newell (2006) described ERP as providing "a depth of information by function and also a breadth of information horizontally across the value chain" (p. 42). Other studies have documented that the stock market reacted positively to ERP system deployment announcements as investors viewed their implementation as an added value for firms. For instance, Hayes et al.'s (2001) found a positive abnormal stock returns with ERP implementation. Using experimental methods, Hunton et al. (2002) discovered that stock analysts positively revise their earnings estimates upward after the announcement of an ERP implementation project. Glover et al. (1999) documented similar results. In essence, these studies demonstrated that the market expects ERP implementation to have favorable effects on implementing organizations. Some of these benefits are the availability of real-time data, improved customer relations, and shortened cycle times. In sum, these studies concluded that investors expect future positive net cash flows to grow as a result of ERP system implementation.

The third stream of ERP studies investigated whether implementation of an ERP system leads to improved operational performance. The results of these studies were mixed. While some found a significant association between ERP adoption and firm performance, others demonstrated only minimal effects (Poston & Grabski 2001; Hunton et al. 2003; Nicolaou 2004;

Werr et al. 2005). A number of studies reported that some companies that have implemented ERP systems were able to improve their competitive position by implementing these systems. For instance, Earthgrains Company reported an improvement in its operating margin as a result of ERP implementation (Sweat, 1998). The company also experienced improvements in on-time delivery, hence, its customer satisfaction metric. According to Appleston (1997), Par Industries reported a significant improvement in delivery performance, and a similar reduction in Work-In-Process (WIP) inventory due to ERP implementation. Other success stories include: IBM Storage Systems, which significantly reduced delivery time for replacement parts; the Daimler-Benz and Chrysler merger, which shortened system integration efforts by 10 years; and Federal Express (FEDEX) which was able to eliminate redundant processes due to SAP implementation (Murray & Coffin, 2001).

Overall, these studies demonstrated that the positive relationships between ERP implementation and improved operational performance are not evident immediately, but are more pronounced two to three years after ERP implementation. In her study, summer (2000) identified the major risk factors associated with ERP projects including the excessive customization of ERP systems, the challenge of using external consultants, and the high investment required to recruit and re-train employees. Examining ERP implementation from the re-engineering perspective, Parr et al. (1999) identified sufficient time and budget as essential factors that are necessary for successful ERP implementation.

Critical Success Factors in ERP Implementation

An important area of research in ERP systems literature is examination of the critical success factors required for successful implementation. Implementation of an ERP system is

complex and time-consuming. Thus, the analysis of critical success factors has been an area of research interests among scholars. The critical success factor as a concept in information systems methodology was first introduced by John Rockart (Boynton & Zmud, 1984). Rockart (1979) defined critical success factors "as the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for an organization" (Rockart, 1979, p.85). Therefore, performance in these areas should be continually measured, and given special attention. According to Finney and Corbett (2007), Rockhart posited that identifying CSFs helps to ensure that critical factors receive the necessary attention. In other words, critical success factors are the important areas that implementing organizations must give special attention to ensure success. In terms of an ERP implementation, the CSFs are essential elements necessary to ensure successful implementation. Rockart (1979) concluded that research on the critical success factors is important, and management should be careful examine CSFs because these factors will determine the project outcome.

Scholar's interest in critical success factors regarding ERP implementation is due largely to the high failure rates of these systems, and, considering the high cost of implementing the systems, the focus on critical success factors is warranted. Plant and Wilcocks (2007) performed a literature review of prior studies that have examined the ERP failure rate. For instance, Calogero (2000) found that the ERP failure rate is between 67% and 90%; that the cancellation rate for ERP implementation is 35%; while 65% of projects experiences cost and scheduling overruns averaging 178% and 230%, respectively. Extending the literature further, Martin (1982) estimated that 90% of all early ERP projects were either late or over budget. However, not all ERP implementations failed to achieve the desired objectives. In other words, ERP deployment results have been mixed. While some implementations succeed and freed organizations from the

limitations of traditional hard coded systems; a significant portion of these implementations has failed to achieve the desired objectives.

To better understand the literature on critical success factors in ERP implementation, I have organized these factors into seven main categories: (I) business plan and vision, (2) change management, (3) communication, (4) ERP team composition, skills and compensation, (5) project management, (6) top management support and championship, and (7) system analysis, selection and technical Implementation.

Business Case and Vision

An essential element for successful ERP implementation identified in previous studies is a clearly defined vision, goal, and business case for the project. For example, Buckhout, Frey and Nemec (1999) argued that a business plan is critical to the success of the project. The plan should contain the benefits, resources, costs, and risks associated with the project. Holland and Bright (2001) suggested that the project also needs a clear vision to guide the ERP implementation. For the vision to be effective at ensuring success, it should specify measurable goals and achievable targets. The business case should also include justification for the investment in an ERP system and such business case should align with the future direction of the organization (Al-Mahasari, Al-Mudimigh & Zairi, 2003).

Change Management

Folger and Skarlicki (1999) argued that the organization's recognition of the need for change to stay competitive is the key driving force for ERP implementation. He posited further that

organizational culture, which is shared values and strong corporate identity is critical to facilitate and enable change.

Employee Training and Involvement

In their study, Bajwa, Garcia and Mooney (2004) found that end-user training is an area that experiences significant cost reductions especially when there budget overruns. Ironically, he argued, training is a critical factor for success of implementation project. User involvement and training are also essential critical factors identified in prior literature. For example, Hong and Kim (2002) emphasized that training should be provided to employees so they can gain an understanding of how the system operates and its impacts on work processes. They also advocated the creation of a support organization such as help desk, to assist with resolution of end-user problems and to effectively manage organizational change.

Communication

An area of focus in previous studies of CSFs in ERP implementation is project communication. Summers (1999) argued that management expectations and goals for the ERP project should be communicated effectively to employees and other stakeholders to gain their cooperation and support. Specifically, stakeholders need to understand the capabilities and limitations of the ERP system. Sarker and Lee (2003) argued that communication is necessary as the system may fail to meet unrealistic expectations due to overselling of the system capabilities. In other words, effective communication will help to manage stakeholder expectations. Communication should be as accurate and complete as possible, to avoid confusion and unrealistic expectation (Hong & Kim, 2002). To achieve the goal of effective communication, communication plan should be

developed and circulated to the user community. The plan should include the business case for the ERP implementation, details of the business process changes, scope and project progress (Sarker & Lee, 2003).

Project Team Composition

Another area of CSF addressed in prior research is the composition and skills of the ERP project team. The integrated design of the ERP system means that it includes all functional areas of the organization. Consequently, the participation and cooperation of technical and business professionals as well as end-users is essential for its successful implementation (Bajwa, Garcia and Mooney, 2004; Folger and Skarlicki, 1999). Hanes and Goodhue (2003) suggested that the involvement of ERP vendors and external consultants is critical for implementation success. Bingi, Sharma and Godla (1999) further argued that the best professionals both inside and outside the organization should be part of the implementation team to encourage innovation and creativity that are important for success. In their study, Holland and Light (2001) specifically suggested that the functional team members or internal employees should be involved in the project on a full time basis. He went further to suggest that team members should have the necessary authority to make quick decisions. In a nutshell, these studies suggested that the project team should be balanced, cross-functional, and populated with representatives of the company employees as well as consultants.

Project Management

Effective project management is essential to ERP implementation success. Siau (2004) argued that the PM role on the project should be clearly specified, with a clearly defined and controlled project scope. Well documented procedure should be followed if the need arises to alter the

project scope including securing the necessary approval based on business benefit (Bajwa, Garcia and Mooney, 2004; Folger and Skarlicki, 1999). In addition, Nah, Zuckweiler and Lau (2003) advocated that changes to the scope should be thoroughly assessed and the implications of such changes in scope in the form of time and cost should be documented and communicated to the organization management. Other scholars have addressed the issues of milestone and project deliverables. According to Holland, Light and Gibson (1999) milestones and delivery dates should be realistic and clearly stated to avoid ambiguity and unrealistic schedules. Because of the complexities of ERP systems, large numbers of professionals are involved in the implementation process. Thus, it is critical to coordinate project activities to ensure that project team members are well aligned (Siau, 2004). In their studies, Robey, Ross and Boudreau (2002) suggested that project schedules should be clearly defined and tracked to ensure that milestones are completed as planned. They recommended using estimated completion dates, costs, quality, and system performance to track project performance.

Executive Management Support and Championship

Top management support is another CSF identified in prior studies. For instance, Sarker and Lee (2003) indicated that it is critical for ERP implementation success. Other studies have echoed same sentiment and argued support and approval from top management is essential for project success (Murray & Coffin, 2001, Summers, 1999). The executive team must allocate sufficient human and capital resources to the project. Similarly, the importance of a project champion has also been highlighted in the literature. In particular, Murray and Coffin (2001) argued that the commitment of the project champion is critical to drive consensus and to oversee the entire implementation project. The project champion should also be an advocate for the project and

must be available to help the project team resolve or address critical issues such as employee resistance. Implementation of ERP is associated with significant change to the organizational structure. Therefore, a project champion must be a high-level official or part of the executive team to facilitate and enforce organizational changes brought by ERP implementation (Gefen, 2004)

ERP System Analysis, Selection and Technical Implementation

Another important CSF addressed in the extant literature is ERP system analysis and deployment strategies. Most of these studies have suggested minimal customization of the ERP system to avoid system issues (Summers, 1999; Light, 2001). According to these studies, customizing an ERP system has been associated with increased costs, extension of implementation schedules, and difficulties experienced with software maintenance and upgrades. Rigorous and thorough system testing prior to go-live has been identified as an important factor for success of the implementation (Folger & Skarlicki, 1999; Al-Mahasari, Al-Mudimigh & Zairi, 2003). Other has suggested the deployment of middleware systems, enterprise application integration (EAI) systems to ease the ERP integration process with the existing organizational infrastructure and technology. In particular, special middleware could serve as a bridge between different applications for system integration (Lee, Siau & Hong, 2003). Siau (2004) advocated the use of vendor-supplied implementation methodologies and development tools to reduce the deployment costs and implementation time, at the same time, facilitate effective knowledge transfer from the consultants to company employees. Other studies addressed ERP vendor selection process. As there are multiple well-established ERP vendors, it is important for the organization to select the right system (Lee, Siau & Hong, 2003). The ERP system chosen must fit well with the

organization's environment and processes to minimize system customization (Bajwa, Garcia & Mooney, 2004, Hong & Kim, 2002).

A fundamental requirement for a successful ERP implementation is the availability and accuracy of system data. Problems with data can lead to significant delays, and inaccurate information which might have considerable negative effects on the company's ability to operate and effectively compete. Lee, Siau and Hong (2003) suggested that organizational planning to implement the ERP system should consider what information to load on the new system before starting the data conversion process. The data conversion process will experience difficulties if the company does not understand what information is needed.

Furthermore, other scholars have identified additional critical success factors for ERP implementation. For instance, Soja (2006) reported that CSFs range from 5 to more than 20 elements. Some of the identified critical success factors are executive management support, well defined and implemented change management, sufficient employee training and communication, business process reengineering, clear goals and visions, good project management, and team members and consultants with the necessary ERP knowledge and experience. Sarker and Lee (2003) identified strong leadership commitment, open and honest communication among team members, and an empowered implementation team as essential factors for implementation success. Akkermans and van Helden (2002) examined the way in which ERP implementation affects information technology in an organization and how the attitudes of the project's stakeholders affect the success of the ERP project. In their study, Shanks et.al (2000) investigated the differences between two implementations in the same organization: One project failed and the other succeeded. They reported that the differences in these projects (with different outcomes) were critical success factors.

Identified CSF from Prior Studies	Mean
Top Management Support	4.29
Project Team Competence	4.20
Interdepartmental Cooperation	4.19
Clear Goals and Objectives	4.15
Project Management	4.13
Interdepartmental Communication	4.09
Management of Expectations	4.04
Project Champion	4.03
Vendor Support	4.03
Careful Package Selection	3.89
Data Analysis and Conversion	3.83
Dedicated Resources	3.81
Steering Committee	3.97
User Training	3.97
Education on New Business Processes	3.76
Business Process Re-engineering	3.68
Minimal Customization	3.68
Architecture Choices	3.44
Change Management	3.43
Vendor Partnership	3.39
Vendor Tools	3.15
Use of Consultants	2.90

Source: Mean ranking of Critical Success Factors by degree of importance in ERP implementation (Sommers & Nelson, 2001).

Some scholars have been critical of the literature that emphasizes high success rates. They have argued that this approach relies almost exclusively on the opinions of managers and is therefore inherently biased (Davis & Heineke, 2005). In their study, Finney and Corbett (2007) cited a shortage of practical responses to correct this problem. On the other hand, Munro and Wheeler (1980) did respond to this suggested weakness in the CSF approach. They developed a model that incorporates not only feedback from senior executives, but also suggestions from lower and middle managers as part of the essential elements for successful implementation.

Similarly, Boynton and Zmud (1984) suggested that all levels of management should be interviewed, to obtain feedback required in determining ERP success criteria. Despites these arguments, however, Munro and Wheeler (1980), posited that the critical success factors approach can still be biased and requires an interviewer to possess specialized skills to mitigate research bias.

Governance Structure and ERP Implementation

The primary focus of corporate governance literature is to ensure that appropriate mechanisms are put in place to meet shareholders' needs. This is accomplished by directing, controlling, and managing corporate activities using good business practices, objectivity, accountability, and integrity (Monks & Minow, 2011). In other words, a good governance structure is one that identifies and selects managers who possess the necessary business skills and provides a mechanism to makes them accountable to shareholders. The successful implementation of an ERP system requires solid corporate governance because transparency requires reliable information, which can only come from a qualified information system. Undoubtedly, good information system management is a result of good information system design.

Accounting literature suggests that corporate governance structure is made up of four groups:

- Top management
- Internal auditor
- External auditor
- Board of directors (audit committee).

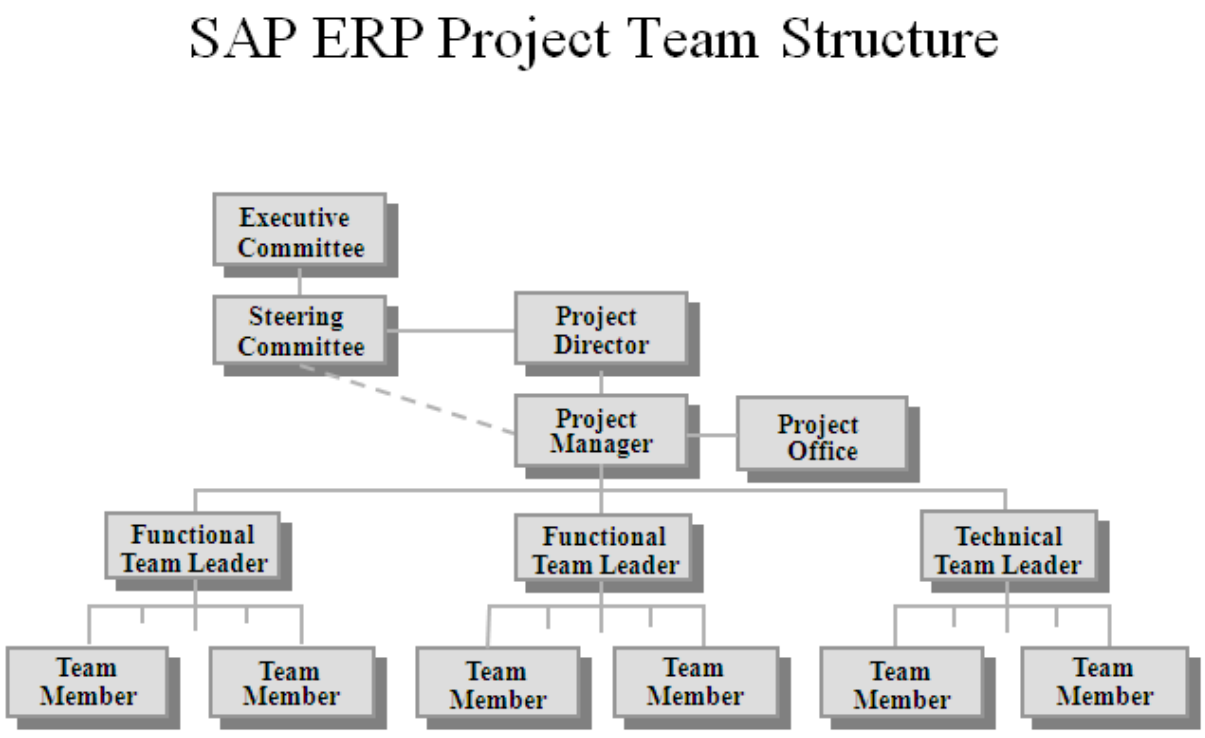
Out of these groups, this study will examine the roles of top management (represented by the executive steering committee) and the internal auditor in the ERP system implementation.

Executive Steering Committee:

Prior studies have identified top management as a critical success factor in an ERP implementation (Bancroft et al., 1998; Somers & Nelson, 2001; Ackermans & Helden, 2002). Specifically, the involvement and support of top-level management have been reported as among the most important success factors for ERP implementation project (Loonam & McDonagh, 2005). Other studies attributed ERP implementation failures to insufficient top management support (McAlary, 1999; Kumar & Hillegersberg, 2000). These studies identified the CEO and the Chief Information Officer (CIO) is the top management team responsible for ERP implementation success (Willcocks & Sykes, 2000; Loonam & McDonagh, 2005). According to Martin and Huq (2007), these two executives are expected to have the skills and competencies to be involved, lead, and support an ERP project. However, due to the complexities of these systems, these executives usually delegate direct project responsibility to high-level managers.

Previous studies have reported the importance of strong project leadership in the form of a steering committee, executive sponsors and project managers. Top management including the CEO and his/her direct subordinates is responsible for designing and implementing corporate policy. Because of the demands of other critical business operations, top management usually delegate project monitoring (and other project management) responsibilities to an executive steering committee. The steering committee generally includes management representatives from various departments of the organization. The primary role of this committee is to provide project oversight and control. Specifically, the steering committee performs important project functions

including owning the project, making human and capital resources available to the project team, monitoring and controlling project planning and progress, and providing support to and motivating project team including the project manager. For a project to succeed, Welti (1999) argued that a capable and powerful steering committee is absolutely essential. In other words, management support is important to achieve project objectives and align project deliverables with organization's strategic business goals. Steering committee involvement and support is needed throughout the implementation phases. Finally, the steering committee acts as a vocal and visible project champion throughout the organization.



Project structure www.empbook.com/structure, adopted from Wallace (2002)

Internal Auditors and ERP Implementation:

Over the past three decades, more organizations have begun to implement ERP systems. These systems provide implementing organizations with enterprise-wide integration, standardization of business processes, lower costs of maintenance, and improved reporting capabilities. In deploying these systems however, the involvement of certain individual and groups is critical. Previous studies have advocated the participation of internal auditors in the implementation process. For instance, Attaway (1999) posited that the primary role of an internal auditor in the ERP deployment process is to ensure that controls are adequate, and to assist with identification of design weaknesses in the system. He argued further that the internal auditor review of system changes, before they are implemented, can enhance organizational objectives by ensuring that the system is aligned with the organization's needs. In his study, Wu (2006) found that the involvement of information systems auditors especially during the system development phase significantly reduced system support costs. In essence, early involvement of auditors in the implementation process can yield the greatest benefits to the organization. Specifically, internal auditor participation can ensure that the system is designed with sufficient security and control. Glover et al. (1999) extended this line of literature by asserting that the internal auditor involvement is essential because the system developer and managers rarely consider the implications of adequate security and controls.

Furthermore, Hunton, Wright, and Wright. (2004) documented that an internal auditor has specific capabilities that might not be present within the system implementation team. Specifically, internal auditors possess the skills to analyze system internal controls which are critical to successful implementation of an auditable and secure system. Weber (1999) categorized the auditor’s role in information system project into three specific duties: concurrent audit, post-implementation audit and general audit. In the concurrent audit role, the auditor is

assigned to the implementation team with the primary purpose of ensuring information system quality. In the post-implementation role, the auditor evaluates the system security after its implementation and provides suggestions on how to improve the system when appropriate. Finally, internal auditors general audit functions involve auditing the system to determine whether it contains sufficient safeguards necessary to pass financial and operational audits.

Durant (1991) argued that the auditor's involvement in an information system implementation is essential to ensure early detection of system errors. He indicated that it is less expensive and destructive (to business) to correct information systems errors before go-live than to correct them after implementing the system. In other words, early error detection reduces the correction costs. Failure to detect errors early can have serious business consequences and be expensive to deploying organizations. Some of the negative consequences include system recovery cost, lost data, unauthorized access, and fictitious transactions, among others. Warren (2004) posited that internal auditors' participation is not just essential during the implementation process, but their continuous involvement is necessary even after system go-live. As part of the production support phase, the internal auditor should continue to monitor system risks by conducting project health checks (Warren, 2004). He went further to recommend that system health checks be performed periodically to ensure that the systems are functioning as expected and that inherent system risks are under control. He concluded that without regular and adequate project health checks, the chances of system failure could increase significantly. He summarized the purpose of periodic audits as follows: to ensure that regulatory compliance is considered and the system implemented to comply with governmental regulations; to use the project health check to reinforce good project management practices; to ensure compliance with organizational

policies and procedures; to ensure that the project team provides regular progress updates and results to management; and to use the project health check drive continual improvement.

Change Management Issues

Change management is considered the "human side" of the system implementation process (Okrent & Vokurka, 2004). Prior studies have argued that change management is an overlooked aspect of system deployments. Specifically, the project team and the organization often neglect to plan adequately for the effects of the new ERP system on internal and external stakeholders. ERP systems introduce large-scale change that can result in employee resistance, confusion, process redundancies, and system errors if not properly managed. For example, Sommers and Nelson (2001) argued that many ERP implementations fail to achieve expected benefits partly because companies underestimate the effort involved in change management. The key change management issue in an ERP implementation is employee resistance. Ansoff (1990) defined resistance as the mechanism used to prevent organizational change by either delaying or slowing down its implementation thereby increasing the costs of instituting the change. In their study, Folger and Skarlicki defined resistance as: "employee behavior that seeks to challenge, disrupt or invert prevailing assumptions, discourses and power relations" (Folger & Skarlicki, 1999, p. 36). The reasons for employees' resistance include the high costs of ERP implementation (and the impacts on the company cash flows) and the pressure to learn (and operate) a new business process in a relatively short time.

Prior studies have identified the ways in which top management can address change management issues. Proper and effective communication, planning, teamwork, and education can help to resolve change management challenges. Sommers and Nelson (2001) argued that communication among the most critical aspects of change management. Communication

includes a clear understanding of organizational strategic goals as related to the ERP implementation, and a clear message regarding the way in which the new system will affect employees at all levels of the organization. In their study, Umble et al. (2003) posited that a clear understanding of new business processes; changes in employees' responsibilities due to the adoption of a new system; and measurements for tracking implementation progress, is essential to resolving change management issues. In their paper, Sommers and Nelson (2001) argued that both vertical and horizontal communication is required for employees to clearly understand their new roles and responsibilities. Effective communication will also help to manage user expectations of the changes required to implement the ERP systems. In addition to the internal communications with employees and managers, external correspondence with suppliers and customers is also critical for successful implementation of ERP systems (Bingi et al., 1999).

Appropriate planning is the second attribute identified as necessary for a successful change management strategy. Umble et al. (2003) argued that that poor project planning was one of the top three reasons an ERP project fails. They suggested that a well-trained cross-functional implementation team is imperative for successful planning. In addition user education and training are essential to successfully implement change management plans. Griffith et al., (1999) asserted that the lack of user training and failure to understand how enterprise applications change business processes are commonly cited reasons for ERP implementation failures. Training is most essential during the acceptance phase when employees are uncertain about the extent of change (Sommers & Nelson, 2001). Teamwork has been identified as a crucial change management issue. Murray and Coffin (2001) argued that the involvement and cooperation of employees and managers from different departments within the organization is essential to success. In essence, a cross-functional plan is the most effective strategy to tear down

departmental boundaries, expose hidden agendas, and assist with the delivery of pertinent information to all departments that will be affected by the change. Employee involvement in the decision-making process is also an important component addressed in prior studies. Umble et al., (2003) reported that employee involvement drives accountability from the bottom up in an organization, helping ensure widespread participation and buy-in.

On the whole, effective change management is critical for successful implementation of ERP systems. Kim et al., (2005) argued that an appropriate change management processes is critical for an organization to successfully adopt and adapt to a new system. Pawlowski and Boudreau (1999) found that half of ERP projects failed to achieve project objectives because the implementing organizations significantly under-estimated the efforts involved in change management. In sum, change management issues can become major barriers to successful implementation and result in low morale, job dissatisfaction, unproductive behavior and increased turnover and absenteeism. A well written and implemented change management plan is therefore required to adequately address these issues. While most of the existing studies have focused on ERP successes and failures, very few have considered the impacts of corporate governance and none has looked at these issues from a global perspective.

Multinational Issues in ERP Implementations

One primary purpose of this study is to examine the challenges involved in implementation of ERP systems in different countries. Multi-country or global ERP implementation introduces another dimension of complexity into the already complex ERP implementation. Some of these complexities are national culture and disparate languages. While extensive studies have been devoted to investigating critical success factors in local (or

domestic) implementations, little is known about international (or multiple country) implementation challenges. In essence, prior studies have either focused on a single country issues or regional issues. They have not addressed project challenges that cut across state boundaries and cultures. This study will fill the gap in the literature by exploring global project management issues to determine whether implementation outcomes vary by country of implementation; and if so, to investigate the contributing factors.

The limited research on international information system implementations has focused on challenges of global projects and global virtual teams. Tara and Steel (2009) referred to a global project as a project that is transnational in scope and that is a temporary endeavor with a project team located in multiple countries. They considered a global virtual project team to be a team that is not physically located in the same place but communicates through electronic methods; and is made up of culturally diverse and geographically dispersed project team members. They went further to document a detailed literature review (of previous studies) on the issues and challenges of global implementation projects. Two of the major challenges in global implementation are cultural differences and different time zones which act as barriers to effective communication within the project team and with external stakeholders. Despite the technological advancements, Sarker and Sahay (2002) argued that project team drawn from multiple countries with different cultural identities makes global implementation of information systems more challenging.

The impact of culture on the operation of international organizations has been extensively documented in fields ranging from management and psychology to accounting and marketing. One frequently cited study for the impacts of culture is the foundational work of Hofstede in his book Culture Consequences published in 1980. Although researchers before him examined

cultural issues, Hofstede was the first to develop a set of indices that quantitatively described national cultures. These cultural scores have been used extensively in cross-cultural academic literature and in corporate training and international management courses in business education curricula (Taras & Steel, 2009).

Other studies have examined the challenges faced by project managers who manage global (or multiple country) implementation projects. For instance, Barczak, McDonough, and Athanassiou (2006) reported that project managers who manage global information system deployment faced extra challenges because team members usually speak different native languages, have different cultural backgrounds, and live and work in multiple countries. Halpin and Huang (1995) suggested that project managers in charge of international projects should receive trained on how to deal with and be sensitive to cultural differences. These managers should also possess explicit knowledge of international laws and country-specific regulations and standards. Extending the literature further, Majchrzak, et al. (2000) suggested that the ability to speak the native languages, a general understanding and respect for other cultures, and being sensitive to cultural differences are essential elements for the successful deployment of an information system in multiple countries. In their study, Yasin et al. (2000), evaluated the responses from 81 project managers, and found that, compared to project managers with no multi-country implementation experience, those with global project management experience have a better understanding of international law, global finance, and international economics systems.

In their study, Sennara and Hartman (2002) reported that both domestic and global projects face some form of cultural risk. However, the cultural impact on project effectiveness and success differ. They identified six issues that are essential for successful global project:

national culture, networking mechanism, project selection process, contracts and negotiation, project management practices, and foreign agent selection. Similarly, Grabowski and Roberts (1999) pointed out organizational structure, communication, culture, and trust as the four areas of risks in virtual organizations. In essence, one main challenge for team from different cultures is trust. In response to these studies, Majchrzak, et al. (2000) proposed ways in which trust in global project team can be improved. They suggested that organizations should create an environment in which team members are comfortable openly discussing conflicts, avoid rigid structures that are not adaptable; and use telephone conferences as well as the Internet as means of communication between team members.

In addition to cultural issues, scholars have documented pertinent challenges for global projects. In their study, Lientz and Rea (2003) identified factors that add complexity to global projects, including diverse cultures, different time zones, fluctuations in foreign exchange of currencies, variations in country rules and regulations, political pressures, and greater public scrutiny of enterprise-wide and large information system projects.

CHAPTER 3: Methodology

Introduction

The purpose of this study is to explore the impacts of such implementation factors as steering committee involvement, internal Auditors engagement, change management policies and global implementation strategies on ERP systems implementation success. Taken together, these implementation factors are used to examine the ERP critical success factors of corporate governance. The results of this research are expected to shed light on the role of corporate

governance on success of ERP implementation. The expected findings may assist companies achieve operational success in future implementations of ERP systems.

Description of Methodology

To effectively study these questions, the researcher will utilize a quantitative method approach. In this study, the theoretical claim is that organizations that focus ERP implementation on the steering committee, Internal Auditor, change management policies and implementation strategy are more successful at implementing ERP than organizations that focus only on management involvement or other factors. This study will test this theoretical claim for its validity.

Design of Study

Previous studies have utilized various methods of data collection to investigate issues of research interest. Some of these methods include personal and telephone interviews, content analysis and self-administered questionnaires. Because of time and budget constraints, the survey approach using self-administered questionnaires was selected for the study. In addition to the survey questions, follow-up interviews were conducted with randomly selected Project Managers and CIOs to confirm assumptions and obtain additional information regarding their project experiences.

Independent Variables: Quality of corporate governance. This variable will be operationalized by a steering committee, internal auditor, change management plan and country of implementation

Dependent variable: implementation success. The variable will be measured by whether the project objectives were met; whether the project was completed on time and whether the project was on a budget.

Population and Sample

The population for this study consists of companies has completed the implementation of ERP in the past five years. There are two reasons why companies that have completed ERP implementation in the past five years are chosen: 1) these implementations are recent which make it easier for participants to recollect the issues and challenges faced during the implementation. 2) Since these are recent implementations, it is more likely that the project managers (and the other team members) that implemented the ERP might still be employed by the same company. In other words, the longer the year of SAP implementation completion, the harder it will be to find employees that can recollect clearly the issues, and challenges faced during the implementation.

The data for this study is obtained through a self-reported survey. I collected data from project managers, directors and VP of IT from firms in 32 countries through three media: ERP user groups in LinkedIn, ERP professional websites and blogs and vendor annual convention. The participants were identified and contacted through their LinkedIn accounts. During the past two decades we have witnessed explosive growth and general acceptance of social media as an important means of communication and relationship building among various groups including accounting professionals. One such medium that is widely used by professionals is LinkedIn. The acceptance of this site as a means to build and maintain professional relationships, has led to the emergence of various professional groups with global membership. Two such groups are the

SAP for Project Managers and SAP Project Manager Forum. As of November 17, 2013, these groups has attracted 4,922 combined members including project managers, team lead and VP of Information Technology departments located in more than 50 countries. Within this group, survey questionnaires were sent to 2,878 members who were identified as Chief Information Officer (CIOs) and Project Managers based on their professional profile. These officers are chosen because of their active involvement in the management of the ERP projects. Thus, they should be familiar with implementation issues and challenges.

Furthermore, other ERP professional websites and forums (other than LinkedIn) were also used to collect data from respondents. The three largest ERP websites used by ERP project managers and CIO to exchange ideas relating to ERP deployed (SAPFANS, American SAP User Group (ASUG) and SAPUsers) were identified and used as media to reach respondents. Lastly, the 2013 annual global convention held in Orlando, Florida (May 14 – 16) hosted by SAP company (the largest ERP vendor by revenue) was also used as an avenue to distribute the survey questionnaires and to conduct personal interviews with population of interest.

Survey Administration

Self-administered survey has some inherent weaknesses. One of the limitations is the concerns regarding response rates and non-response bias. Specifically, insufficient response rates may adversely affect the reliability, validity and generalizability of the study results. To mitigate this risk, this study will used survey administration model developed by Dillman (2007). The model advocates the use of follow-up reminders, respondent support and promises of anonymity to improve survey response rates. Correspondence was personalized to the extent possible: I obtained their personal email addresses from their LinkedIn accounts and sent the survey

questionnaires directly to them. Additionally, respondents were guaranteed anonymity. The first survey was sent in November 2013. Approximately four weeks after the initial email contact, a second email reminder was sent to the study sample. The survey also included clear and concise instructions regarding the appropriate completion of the questionnaires. The initial communication to the participants also included a statement that participation in the survey is voluntary, and assured them of the confidentiality of their responses.

Respondents were asked to indicate their degree of agreement or disagreement with each of the 24 statements on a 5-point Likert response scale. The response scale ranged from *Strongly Agree* (scored as +2) to *Strongly Disagree* (scored as -2).This methodology was employed because it is relatively easy for respondents to use and responses from such a scale are likely to be reliable (Anderson et al. 1983). The instrument contains four sections including demographic information, implementations critical success factors, modules implemented and implementation concerns. The format of the survey also provided the respondents with the optional opportunity to provide written comments. A significant portion of the respondents provided valuable comments.

Out of the 2,878 surveys sent to respondents, I received a total of 335 usable responses. Of these usable responses, 41 were discarded because of incomplete responses. I also excluded responses from participants from countries with only one or two responses (e.g., Oman, Bulgaria, Argentina and Angola). The final sample consists of responses 289 from IT professionals.

Validation of the Instrument:

The instrument is split into four sections, which test for business results of implementing ERP, critical success factors of ERP, modules implemented and implementation methodology.

The instrument will be field-tested by SAP professionals and modified for account, clarity, and appearance based on their recommendations.

Data Collection:

The self-administered survey data was collected using Survey Monkey—an online survey organization.

Data Analysis:

The collected data was loaded into and analyzed using the Statistical Package for the Social Sciences (SPSS).

Method of Data Analysis:

The analysis of variance (ANOVA) along with the mean and standard deviation was used to compare the collected data. Ordinary Least Square (OLS) was developed and tested as part of the regression analysis. Reponses will be grouped initially by response to success attribute questions. These groups were next tested for correlation to critical success factors indicating focus on the roles of steering committee and internal auditors in the implementations, and focus on change management (with people affected by the change or culture change). This data analysis will form the foundation for conclusions from this research.

Chapter 4: Data Collection and Results of the Study

In this chapter, I describe the data analysis and results of this study. This chapter is divided into three sections. The response rates from respondents are discussed in the first section. The second section discusses sample characteristics, validity and reliability of the data and the instrument. The third section presents the regression results conducted to determine the effects of examined variables on the likelihood of implementation success.

Pilot Study

For this study, I adopted a two-phase pilot approach to provide the opportunity to refine the survey questions and establish content validity. The first phase of the pilot study consisted of a panel of experienced ERP project Managers and Vice President of IT who examined the instrument for clarity and completeness. In the second phase, the revised survey questions were presented to a subset of the study population for completion. Each of these phases is discussed below.

In the first phase, the survey instrument was presented to a few select ERP project managers for feedbacks and suggestions on how to improve the survey questions. Ten Project Managers and one VP of IT participated in the pilot study, representing an array of expertise in ERP system implementation. The group included eight project managers drawn from diverse industries including technology, manufacturing, energy and retail, a former partner responsible for ERP implementations at a Big Four consulting firm, and an independent group, senior project managing consultant, based in Europe. This group was asked to review the survey instrument for clarity and completeness, and the survey was adjusted according to their feedbacks.

During the second phase of the pilot study the revised survey was tested with a subset of the sample population. The sub-sample was made up of fifteen IT directors and project managers, who attended the 2013 SAP American SAP User Group (ASUG) annual conference in June, 2013. The survey instrument was again revised and changed to reflect feedbacks from the pilot study. The final survey that was deployed to respondents is presented in Appendix A.

Response Rate and Non-Response Bias

The research population for this dissertation consists of project managers, VPs of IT and other senior members of ERP project teams. The study seeks to determine critical success factors for SAP ERP implementation from participants in different countries. Thus, the sample includes companies that have implemented ERP systems in countries in Europe, Asia, Americas and Africa, especially in the last five years. It is difficult to determine the exact number of companies that fall into this category as SAP Inc. considers this information confidential and did not release the customer data. Out of the 2,878 surveys sent to respondents, I received a total of 335 usable responses. Out of this number, 41 responses were deemed incomplete, leaving 289 usable responses. The response rate was 9% which is consistent with response rate of previous ERP studies. Out of these responses, 79% were from project managers and 16% IT directors /CIOs and 5% from project lead or business managers (non-IT).

Data was collected from two main sources: ERP professional groups in LinkedIn and other ERP professional websites and forums. Over 90% of the data was from ERP professional groups with presence in LinkedIn while the remaining 10% was from varieties of websites, forums and blogs created and used by ERP professional worldwide. These sources were clearly identified and data from one source was compared to others to validate the consistency of the

data. A significant portion (98%) of the responses gathered from other ERP professional websites were from project managers with only 2% from CIOs. Unlike other websites, higher percentage (18%) of responses from LinkedIn website was from CIOs/directors. The responses from CIOs and project managers from these two sources were similar.

Personal interviews were conducted with twenty-five CIOs and project managers in from eight countries – USA, Great Britain, India, Singapore, Nigeria, Argentina, France and South Africa. The purpose of the follow-up interviews was to confirm the responses from the survey to determine whether there were discrepancies between the interview responses and the survey responses. In addition, personal interviews allowed the researchers to obtain additional and more detail responses to certain questions. The responses of both data sources were similar. In other words, the CIOs and project managers through the self-administered survey and one-on-one interviews confirmed that CSFs are crucial to ensure successful implementation outcome.

Respondent Demographic Information

Information was collected on the position of the respondent, the industry classification, and current country of residence, the income of the company, SAP modules implemented, when the SAP implementation was completed, and country where the respondents have participated in SAP implementation.

Position of the respondent

The positions of the respondents are presented in Table 1. Most of the respondents (87%) were directly involved with the project as project manager, project lead and consultants.

Table1:

	What is your position in the company?		
		N	%
1	President/CEO	0	0%
2	CIO/Director	52	16%
3	Project Manager	257	79%
4	Project Lead /Business Rep	13	4%
5	Functional Team member	3	1%
6	SAP User	0	0%
	Total	325	100%

Industry Classification

The respondents were asked to indicate the industry classification of their company. As shown in Table 2, 27% were in technology, 22% in manufacturing and 23% from the technology consulting sector. The other sectors percentages are in single digits.

Table 2:

Please select your company industry classification		
Answer	N	%
Energy	27	8%
Banking and Finance	13	4%
Technology	90	27%
Technology Consulting	76	23%
Manufacturing	69	22%
Pharmaceutical	17	5%
Retail	13	4%
Telecommunication	3	1%
Utilities	7	1%
Others (Please Specify)	17	5%
Total	332	100%

Country of Residence

The respondents are from 32 countries spread across all regions. See Table 3.

Table 3:

What is your current country of residence?

Angola	France	Romania
Australia	Ghana	Russia
Austria	Germany	Serbia
Brazil	Greece	Singapore
Canada	India	South Africa
China	Ireland	Spain
Croatia	Malaysia	Switzerland
Columbia	México	Turkey
Denmark	Nigeria	United Kingdom
Finland	Philippines	United States
	Portugal	Vietnam

Company income

As Table 4 shows, annual incomes are evenly distributed; 28% was over $5 billion.

Please select your approximate company income (Firm Size)

		N	%
1	$0 to $10 Million	46	15%
2	$10 to $100 Million	28	9%
3	$100 to $500 Million	52	17%
4	$500 to $1 Billion	44	15%
5	$1 Billion to $5 Billion	44	15%
6	Over $5 Billion	84	28%
	Total	298	100%

SAP Modules implemented

The respondents were asked to indicate the type of module they implemented (see Table 5). Most respondents (86%) reported that they have implemented the financial module (FICO). The result shows that the financial module (FICO) is the most critical and the first to be implemented in most companies.

What SAP Modules did your company implemented?

		N	%
1	FICO (Accounting)	78	86%
2	PP (Manufacturing)	58	64%
3	MM (Inventory and procurement)	72	79%
4	SCM (Supply Chain Management)	36	40%
5	Others (Please Specify)	61	67%

Year of completion of SAP project

One of the main requirements for selecting participating companies is that they must have completed the SAP implementation in last five years. As shown in table 6, 95% of respondents reported to have completed SAP implementation during this time frame.

Table 6:

When was your last SAP implementation completed?

	N	%
1 - 5 years	246	86%
6 - 10 years	36	13%
Over 10 years	4	1%
Total	286	100%

Country(s) where respondents have implemented SAP

Respondents have participated in SAP implementation in over 58 countries regions such as Americas, Europe, Asia, Middle East and Africa in all the regions.

Table 7:

Angola	Chile	Finland	Indonesia	Romania	Switzerland
Argentina	China	France	Ireland	Russia	Taiwan
Austria	Colombia	Gabon	Italy,	Saudi Arabia	Thailand
Baltics	Congo	German	Japan	Serbia	Tunisia
Belgium	Croatia	Ghana	Kuwait	Singapore	Turkey
Bolivia	Cyprus	Greece	Malaysia	Slovenia	UAE

Bosnia	Czech Republic	Hong Kong	Mexico	South Africa	United Kingdom
Brazil	Denmark	Hungary	Netherlands	South Korea	United States
Cameroun	Ecuador	India	Nigeria	Spain	Vietnam
Canada	Estonia		Poland	Sweden	

Table 8:

What region(s) were included in the SAP implementation (Please check all that apply)

		N	%
1	North America	79	54%
2	South America	37	26%
3	Europe	89	61%
4	Asia	66	46%
5	Africa	20	14%
6	Middle East	21	14%
7	Not applicable / Do not know	0	0%

2.1. Analysis of Research Questions

Research Question 1

What is the relationship between steering committee involvement and successful implementation of SAP ERP systems?

Ho: There is positive relation between steering committee involvement and successful ERP implementation.

Ha: There is no relation between involvement of steering committee and successful ERP implementation.

Survey Questions

To determine the impacts (importance) of the steering committee in ERP implementation success, respondents were asked five questions regarding steering committee engagement. The

first question asked whether a steering committee was involved in their project: 97% indicated YES, while only 3% answered NO and 1% was not sure (see Table 9).

Table 9:

Was there Steering Committee present in most of the ERP projects you participated in?

		N	%
1	Yes	278	97%
2	No	8	3%
3	Not sure	2	1%
	Total	288	100%

Respondents were also asked about the position of the steering committee members, 21% indicated CEO, 35% VP, and 46% directors (see Table 10).

Table 10:

Who were the members of the Project Steering Committee?

		N	%
1	CEO	36	21%
2	President	20	12%
3	Vice President (VP)	58	35%
4	Directors	78	46%
5	Senior Managers / Managers	70	42%
6	Others (Please specify)	22	13%

In addition, the respondents were asked to indicate the importance of steering committee on their project, 56% indicated extremely important, 37% indicated very important, while only 6% indicated somewhat important (see Table 12).

Table 12:

How important is the Project Steering Committee Involvement in an SAP Project?

		N	%
1	Extremely Important	166	58%
2	Very Important	96	33%

3	Somewhat Important	24	8%
4	Neither Important nor Unimportant	2	1%
5	Not at all Important	0	0%
	Total	288	100%

The researcher was also interested in understanding the specific roles played by the steering committee on an ERP project. In answering this question, 84% of respondents claimed that steering committee members help with monitoring the project (to ensure it is on track and meeting expectations), 60% answered they approve the project budgets, 53% claimed they help with project issues resolution, and 37% indicated they help with promoting the project and its benefits.

Table 13:

What role did the Steering Committee played in the implementation? (select all that apply)			
		N	%
1	Monitor the Project Progress	72	84%
2	Approve Project Budgets	52	60%
3	Assist with Issue Resolutions	46	53%
4	Provide Project Resources	24	28%
5	Project Champion	32	37%
6	Other (Please Specify)	14	16%

To determine their contribution to project success, the researcher asked the respondents to rate the steering committee response to issues brought to its attention for resolution, 51% of the respondents indicated that committee members responded quickly, 39% said they provided a somewhat slow response, and 2% claimed they were slow in responding to issues (see Table 14).

Table 14:

How responsive were the Project Steering committee members to issues raised during the implementation?		
	N	%

1	Quick Response	110	56%
2	Somewhat Slow Response	68	34%
3	Slow Response	6	3%
4	Very Slow Response	6	3%
5	No Response (to Some of the Issues)	8	4%

Internal Auditor

Research Question 2

What roles did the Internal Auditors played in the implementation of SAP Systems?

Ho: Internal auditor's involvement increase the likelihood of ERP implementation success

Ha: Internal auditor's involvement does not increase the likelihood of ERP implementation success

The researcher sought to understand the role played by the internal auditor in ERP implementation. Therefore, four questions were designed and presented to the respondents. The first question asked respondents whether internal auditors were involved in the implementation: 55% answered YES, while 41% answered NO (see Table 15).

Table 15:

Were the Internal Auditors involved in your SAP Project?

		N	%
1	Yes	138	50%
2	No	122	44%
3	Comments	16	6%
	Total	276	100%

The next question asked about the specific roles the internal auditors played: 35% indicated that internal auditors reviewed pre- and post-implementation designs, 32% claimed they acted as

consultants on the project, 11% replied that they were part of the implementation team, and 27% reported that no internal auditors were on their projects (see Table 16).

Table 16:

If yes, what role did Internal Auditor play in the implementation?

		N	%
1	Team Member (Part of the Team)	32	14%
2	Consulted Only When Needed	72	31%
3	Review Pre- & Post-Implementation	88	38%
4	Not Involved / No Role	70	30%
5	Comments	14	6%
	Total	276	100%

Last, the respondents were asked to rate the importance of internal auditors in ERP projects. Most of the respondents (57%) indicated that they were somewhat important, only 21% claimed they were very important (see Table 17).

Table 17:

How important is Internal Auditor involvement in SAP Project?

		N	%
1	Extremely Important	20	7%
2	Very Important	62	21%
3	Somewhat Important	146	50%
4	Neither Important nor Unimportant	46	16%
6	Not at all Important	16	6%
	Total	290	100%

The researcher wanted to know respondents opinion regarding whether internal auditors can maintain their independence (and integrity) if they are active member of the project team. Most respondents (54%) indicated YES, while 43% answered NO (see Table 18).

Table 18:

	In your opinion, can Internal Auditor be objective and independent if they are active member of the SAP project Team?	N	%
1	Yes	90	54%
2	No	72	43%
3	Comments	4	2%
	Total	166	100%

Change Management Plan and Implementation

Research Question 3

What is the importance of employee training in the implementation of SAP Systems?

Ho: Employee resistance is the most significant change management challenges faced during ERP implementation process

Ha: Employee resistance is not significant change management issues experienced during ERP implementation process

An important element of a change management plan in an IT project is end user engagement and support. In this study, employee training is used as a proxy for change management plan. Specifically, the study attempted to understand the importance of employee resistance and employee training, as part of the change management process, in ERP implementation.

Respondents were asked two questions. First, they were asked to rate the importance of employee training and communication, most (58%) indicated that it was extremely important, 28% claimed it is very important, while only 4% reported that it was somewhat important (see Table 19).

Table 19:

How important is Employee Involvement, Communication and Training

		N	%
1	Extremely Important	192	66%
2	Very Important	90	31%
3	Somewhat Important	8	3%
4	Neither Important nor Unimportant	0	0%
5	Somewhat Unimportant	0	0%
6	Not at all Important	0	0%
	Total	290	100%

The second question asked whether the number of hours of training offered to employees was adequate (sufficient) for them to be prepared to use the new ERP system. The majority (75%) indicated that the training was sufficient, while 21% answered NO (see Table 21).

Table 21:

In most of your SAP implementations, were the trainings provided to end user adequate?

		N	%
1	Yes	204	70%
2	No	64	22%
3	Comments	22	8%
	Total	290	100%

Employee Resistance

Five questions were developed to explore five areas of interest regarding employee resistance: significance of the resistance, reasons for the resistance, forms of resistance, whether resistance varies by country, and reasons for variations.

The first question addressed the impacts of employee resistance on implementation outcome. The respondents were asked to rate the level of resistance to ERP implementation in their company. A little over half (51%) indicated that employee resistance was significant, 33% indicated was somewhat significant, while 16% answered that it was not significant (see Table 22).

Table 22:

In most of your implementation, how significant (or difficult) is employee resistance?	N	%
Extremely significant	149	51%
Somewhat significant	73	25%
Not Significant	55	19%
Comments	14	5%
Total	290	100%

For the second question relating to employee resistance, the respondents were asked to select reasons for employee resistance to ERP implementation. A little over half (53%) indicated the fear of employee layoffs as the primary reason for resistance, 22% indicated the stress of learning a new system, 11% responded that they resisted the ERP implementation because they considered the systems too expensive and not worth the investment, and 9% answered that the legacy systems function well and new system is not needed (see Table 23).

Table 23:

In your opinion, what were the reasons for employee resistance in your project?	N	%
Fear of layoff (employment termination)	187	53%
ERP system too expensive	39	11%
Learning new technologies	77	22%

Current systems function well (no need for new system)	31	9%
Others (please specify)	18	5%
Total	352	100%

With the third question regarding employee resistance, the researcher sought to identify how employees showed their resistance (form of resistance). The respondents were asked to indicate how employees demonstrated their resistance to the project. Most (45%) indicated that employees displayed a lukewarm attitude toward the project, 32% reported that employees were reluctant to learn the new system, 8% indicated that employees, especially programmers of the legacy systems (replaced by ERP systems) provided poor quality data in an attempt to sabotage the project success, and 6% reported that employees spread gossips/rumors about the capabilities and negative impacts of the new systems on the company and the employees (see Table 24).

Table 24

How did the employees displayed/demonstrated their resistance to the project		
	N	%
Lukewarm/hostile attitude towards the project	142	45%
Reluctant to learn the new system	101	32%
Provide poor data from legacy systems	25	8%
Spread gossips/rumors about the project	19	6%
Others (please specify)	28	9%
Total	315	100%

The fourth question relating to employee resistance investigated whether resistance varies by country of ERP implementation. In other words, the researcher wanted to determine whether the conditions in each country affect the propensity of employees to resist ERP implementation. Almost all respondents (92%) reported that employee resistance varies by country, only 6% indicated no change (see Table 25)

Table 25

If you participated or managed ERP implementation project in multiple (or more than one country), in your opinion, do the employee resistance varies by country?	N	%
Yes	198	92%
No	13	6%
Comments	4	2%
Total	215	100%

The last question relating to employee resistance was designed to identify contributing factors to variations in employee resistance across countries. As shown in Table 26, the number one reason for differences was country culture (35%), the second highest was the legal system (employee lawsuits), and the third highest reason was the influence of labor unions. Other reasons were employee/employer relationship (10%), and level of education (8%).

Table 26

If answers to the previous question is YES, what factors are responsible for the variations/differences	N	%
Country culture	69	35%
Legal system (employee lawsuits)	48	24%
Influences of labor union	37	19%
Employee / Employer relationship	19	10%
Level of education	16	8%
Others (please specify)	8	4%
Total	197	100%

Global Implementation Strategies

Research Question 4

What is the implementation strategies adopted for the ERP implementation project?

Ho: ERP implementation success is a function of deployment strategy

Ha: ERP implementation success is not a function of deployment strategy

To begin answering the research question, respondents were asked three questions. The first question asked the respondents to specify the type of implementation strategy used. Most of the respondents (84%) indicated a “phased out” strategy, while 12% used “big bang” (see Table 27).

Table 27:

What was the implementation strategy used in most of the SAP deployments you managed?

		N	%
1	Phased-out or Roll-out	228	81%
2	Big Bang	34	12%
3	Both	20	7%
	Total	282	100%

The respondents were also asked to select the reasons for the chosen strategy. The majority (60%) indicated the complexity of the system, 49% indicated the ease of implementation, and 32% selected time constraints as the reason (see Table 28).

Table 28:

What is (are) the reason(s) for the chosen strategy?

		N	%
1	Project Risk	98	52%
2	Ease of Implementation	96	51%
3	Time Constraint	66	35%
4	Complexity	110	58%
5	Other (Please Specify)	12	6%
	Total	382	100%

The last question sought to determine whether the respondents were satisfied with the results produced with the chosen strategy. The majority (51%) indicated they were very satisfied, 28% were extremely satisfied, while 18% were just satisfied (see Table 29).

Table 27:

	Were you satisfied with the results of chosen strategy?		
		N	%
1	Extremely Satisfied	44	28%
2	Very Satisfied	82	51%
3	Satisfied	28	18%
4	Not Satisfied	6	4%
	Total	160	100%

Overall Project Results

The main purpose of this study was to identify critical success factors for ERP implementation. Respondents were asked several questions to identify how they measure success and the factors that contributed to their success (and in some cases failures). Five questions in the survey were included in this section.

The first question asked the respondents to choose what they considered to be the reasons for implementing ERP. Note that most respondents indicated multiple reasons. Among the respondents, 81% indicated process automation and improvement as the reason, 75% cited the desire for better reporting tools as a reason, 66% chose support for business growth, and financial (cost savings) was the reason indicated by 58% of the participants (see Table 30). Additional reasons were inventory optimization, better audit and controls, and having a real-time integrated system.

Table 30:

Which of the following were the reasons for implementing SAP? (Choose all that apply)

		N	%
1	Financial Reasons (e.g. Cost Savings)	180	60%
2	Process Automation/Redesign	240	79%
3	Support Business Growth	194	64%
4	Better Reporting/Business Analysis	218	72%
5	Increase Productivity	154	51%
6	Other (Please Specify)	48	16%

The second question asked the respondents to indicate the overall results of their implementation. They were asked to choose from among three categories of success: (1) very successful (means all three criteria of a successful project were met: on time, on budget, and objectives met), (2) somewhat successful (two of the three criteria of successful deployment met) and (3) not successful (only or none of the criteria is met). Less than half of the respondents reported that their project was very successful (34%). The majority indicated that their project was somewhat successful: 54% indicated that they strongly agreed with that assessment, and 12% indicated that the project was not successful (see Table 31).

Table 31:

Overall, the SAP Implementation project (or projects) that I managed (or participated in) was/were ((*Very successful* if: project was completed on time, on budget and meet business objectives: *Somehow successful*: if project achieve only 2 of the 3 measurements of success; *Not successful*: if project only meet one or none of the measurements)

		N	%
1	Very Successful	104	34%
2	Somewhat Successful	164	54%
3	Not Successful	36	12%
	Total	304	100%

As a follow-up to the earlier question, respondents were asked to identify the metrics used to measure success. Multiple factors were selected: 77% indicated that the SAP system has better functionalities (and is more user friendly) than their legacy systems, 63% indicated the project was on budget and met user expectations, and 61% responded that the system was implemented on time. Other metrics used to measure success included implementation of standard enterprise-wide business process, better business analysis and forecasting, master data harmonization, inventory reduction mechanism, improvements in supply chains systems and increased productivity. (see Table 30).

Table 32:

If successful, what were the metrics? (Select all that apply)

		N	%
1	Implemented on Time	182	62%
2	On Budget	172	59%
3	Met User Expectations	178	61%
4	Better System than Legacy System	238	81%
5	Others (Please Specify)	54	18%

Respondents were also asked to identify factors that contributed to the successful implementation. Multiple factors were selected: most participants (90%) indicated management support as an important contributing factor; 94% indicated project team performance, 82% indicated employee involvement and training, and 70% reported that steering committee involvement contributed to implementation success. Only 16% indicated internal auditor involvement as a factor for successful implementation (see Table 31). Other factors identified were a comprehensive change management plan, aggressive testing, and clarity of corporate vision for change.

Table 33:

If successful, what were the contributing factors? (Please select all that apply)

		N	%
1	Steering Committee Engagement	109	74%
2	Internal Auditor Involvement	22	15%
3	Management Support	124	84%
4	Project Team Performance	137	93%
5	Employee Involvement & Training	118	80%
6	Other (Please Specify)	19	13%

Furthermore, respondents who indicated that their projects were not successful, were asked to indicate the factors that contributed to the failure (neutral). The majority (72%) reported employee resistance to the implementation of new software as the main reason for the unsuccessful implementation. Also, 69% indicated lack of top management support, 44% reported inadequate training, and 36% indicated poor performance of the implementation team as the reason. Other reasons identified by the respondents included organization not culturally ready for the change required by the ERP system, poor testing, project objective not clearly defined, inadequate time, and communications problems between the company and the consulting company implementing the system (see Table 34).

Table 34:

If NOT successful, what were the major reasons? (Please select all that apply)

		N	%
1	Lack of Management Support	43	69%
2	Steering Committee Not Actively Involved	26	42%
3	Employee Resistance	42	68%
4	Poor Project Team Performance	26	42%
5	Noninvolvement of Internal Auditor	9	15%
6	Inadequate Employee Training	25	40%
7	Other (Please Specify)	16	26%

Last, the respondents were asked to rank the factors responsible for successful implementation in order of importance to the project. Having a good change management plan was ranked the most important by most respondents. In second place was employee training, third was management support, fourth was steering committee participation and internal auditor involvement was reported as the least important critical success factor (see Table 35).

Rank the 5 factors below in order of importance to success of your project (1=lowest, 5=highest):

		2	3	4	5	Total Responses
1	Internal Auditor Involvement	19	11	8	19	127
2	Steering Committee Participation	27	12	32	31	113
3	Management Support	11	19	35	52	128
4	Employee Training	37	42	29	17	129
5	Change Management Plan	22	47	36	21	138
	Total	116	131	140	140	

Global Implementation – Project Results by Country

This section of the survey covered issues and challenges faced in global or multi-country implementations. One aim of this study was to determine whether SAP implementation results vary by country. In other words, the researcher wanted to know whether ERP implementation is more successful in one country than another. In addition, the researcher attempted to determine the reasons for any disparities in implementation results.

Research Question 5

Did the implementation outcome vary by country of deployment?

Ho: There are significant variations in deployment outcome among firms in different countries

Ha: There is no variation in implementation outcomes across-countries

One of the questions asked respondents, especially those who were involved in global or multiple countries of implementation, to indicate whether implementation success varied by country. Less than half (47%) of the respondent answered YES, while 44% indicated NO (see Table 36).

Based on your experience, did implementation outcomes vary by countries?

		N	%
1	Yes	136	50%
2	No	108	40%
3	Comments	26	10%
	Total	270	100%

The second question asked the respondents to indicate the countries that they regarded as more difficult (thus less successful) in which to implement SAP. They identified sixteen countries: Angola, Congo, Brazil, China, Russia, India, United Kingdom, Japan, Canada, Argentina, Mexico, Italy, Romania, United States, Kuwait and Saudi Arabia. The third questions

asked the respondents to list the countries where implementation was more successful. They reported countries such as Portugal, Turkey, Germany, Sweden, Norway, Denmark, United States, France, Belgium, Australia, South Africa, and South Korea.

The last question in this section asked respondents to provide factors responsible for success (or failure) in one country as compared to another. Most respondents reported multiple reasons, and the majority (46%) indicated that legal or statutory requirements in each country are the main factors explaining disparity in SAP implementation results; 41% indicated language barriers, 33% reported the availability of skilled consultants, and 25% indicated national culture (see Table 37).

Table 37:

What were the contributing factors to the variations in implementation outcomes by country?

		N	%
1	Legal or Statutory Requirements	126	54%
2	Language Barriers	106	45%
3	Availability of Skilled Consultants	98	42%
4	Political Environment	56	24%
5	National or Country Culture	94	40%
6	Other (Please Specify)	24	10%

3.1. Regression Analysis

In the previous section, the raw data collected from respondents were reported. To further understand the relationship between organizational structure and successful ERP implementation, ordinary least squares regressions were conducted. The regression allowed the researcher to control for certain factors that might influence the results of the study.

Previous studies examining the critical success factors of ERP systems have utilized multiple regressions to analyze the collected data (Gefen & Ragowsky, 2005; Hong & Kim,

2001). Various forms of regression were suitable for this study – (e.g. linear, quadratic, step,). Linear multiple regression was chosen based on the assumption that the correlation between governance structure and successful implementation is linear. Before the regression tests were conducted, the data were first examined to check their suitability for regression analysis. One issue identified in the extant literature involving social science research is the issue of multicollinearity between the independent variables. For instance, Hair et al. (1998) suggested that multicollinearity should be addressed if the correlation between independent variables exceeds 0.90. To check the multicollinearity, I performed two tests. First, I regressed each independent variable with other independent variables. The regression R-square ranged from .315 and .612, which is below the threshold of 0.90 recommended by Hair et al (1998). The test indicated that mulitcollinearity was not a problem with this study.

The second test was to determine whether linear regression was suitable for this study. The suitability of linearity was assessed by analyzing residuals and partial regression plots. The scatter plots of residuals plotted against predicted values showed no non-linear pattern to the residuals. The results suggested that linear regression was appropriate for this study. In addition, the patterns of increasing and decreasing residuals confirmed constant values of the residuals across the independent variables. Furthermore, to test for the independence of the error terms, residuals were plotted against the variables in the order in which the responses were collected. The plot analysis of the residuals also indicated no consistent pattern, which confirmed the independence of the residuals. Last, the data were checked for normality of the error term distribution. Examination of the histograms of residuals indicated no major problems associated with non-normality of the variables.

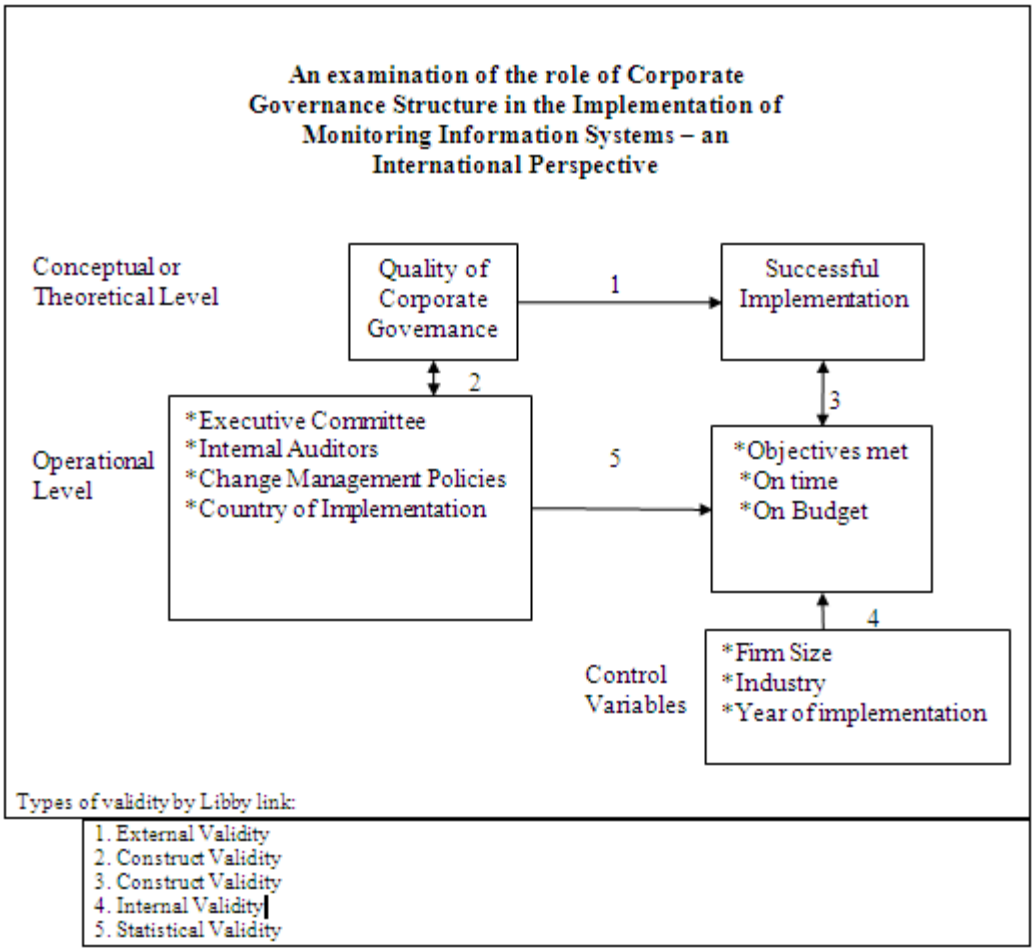


Fig 1 shows the relation between independent and dependent variables of this study

Determinants of ERP implementation success

The regression model is used to examine the critical success factors in ERP implementation. SUCPROJECT is a dummy variable used to capture whether ERP implementation was success or not. The model is represented by equation:

$$SUCPROJECT = \beta_0 + \beta_1 STERCOM + \beta_2 INTAUD + \beta_3 CHNGMGMT + \beta_4 COUNTRY + \beta_5 IMPLSTRA + \beta_8 GDP + \beta_9 FirmSize + \beta_{10} Industry + \varepsilon$$

Where:

STERCOM	= Represent the presence and the roles of steering committee in the ERP implementation project
INTAUD	= Capture the role of internal auditor in the ERP deployment project

CHNGMGMT	= Variable to capture the change management plan and procedure in an organization deploying ERP system
COUNTRY	= Based on respondent country of residence.
IMPLSTRA	= Capture the implementation strategies adopted to implement ERP system
GDP	= Average log of GDP per capita 1990 – 2012. World Bank
Firm Size	= Log of total assets
Industry	= Dummy variable that indicate the company classification (two digit SIC codes).

3.1.1. Regression Results

The primary purpose of this study was to investigate the role of governance structure on the outcome of ERP implementation. The independent variable – quality of governance structure – was operationalized by four variables: steering committee, IT auditors, change management policies, and country of implementation. The dependent variable – successful implementation – was operationalized by whether project objectives were met, and whether the project was completed on time and on budget. The control variables were firm size, industry classification, year of implementation, respondent position in the company and number of implementation completed by respondents. Four regression tests were conducted to analyze the data to understand the correlation between the independent and dependent variables.

3.1.2. ERP Project Outcome and Governance Structure

In the first regression, I tested to determine which independent variables were significant in determining the ERP implementation success: steering committee involvement, information system auditor participation and change management plan. The dependent variable was a dummy

variable OUTCOME that took the value of 1 if the respondent indicated the project was completely successful and 0 otherwise. In analyzing the impacts of steering committee involvement in ERP implementation, three questions were examined: (1) whether steering committee was present in the project, (2) the importance of steering committee involvement in ERP implementation, and (3) the responsiveness of steering committee members to project issues. As shown in Table 1c, the coefficient of steering committee presence is positive but not significant at the 5% level. Specifically, the coefficient is .099, which is greater than p-value < .05. Similarly, the coefficient of importance of steering committee involvement is also positive but insignificant at .687. However, the coefficient of steering committee responsiveness is positive and significant at .001. This indicates that it is not sufficient for the steering committee to be involved in an ERP project, for the project to be successful, steering committee members must respond in a timely manner to issues raised by the project team. Furthermore, the coefficient of employee training and communication and information system auditor involvement is positive but insignificant (.243 and .634 respectively). The r-square of the regression is 21%.

Table 1a Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.462[a]	.213	.104	.4745

a. Predictors: (Constant), WasthereIA, NumofImpl, HowresponsiveisSteeringcomm, Position, Steeringcommitteepresent, ImportanceofSteeringComm, Industry, EmployeeInvolvementCommunicationandTraining, Yearofimplementation, FirmSize

Table 1b ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.393	10	.439	1.952	.052[b]
	Residual	16.209	72	.225		
	Total	20.602	82			

a. Dependent Variable: OUTCOME

b. Predictors: (Constant), WasthereIA, NumofImpl, HowresponsiveisSteeringcomm, Position, Steeringcommitteepresent, ImportanceofSteeringComm, Industry, EmployeeInvolvementCommunicationandTraining, Yearofimplementation, FirmSize

Table 1c Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.234	.614		-.381	.704
Industry	.035	.022	.183	1.625	.109
Firm Size	-.018	.033	-.063	-.534	.595
# of Implementation	-.013	.025	-.056	-.515	.608
Year of implementation	-.038	.136	-.033	-.280	.780
Position	.045	.036	.143	1.267	.209
Employee training	.150	.127	.136	1.178	.243
Steeringcommitteepresent	.834	.499	.183	1.671	.099
Steering comm. Response	.203	.058	-.399	-3.494	.001
S Comm. importance	.047	.115	.046	.404	.687
IT Auditor	-.052	.110	-.052	-.478	.634

a. Dependent Variable: OUTCOME

3.1.3. US ERP Implementation Outcome Compared to Other Countries

The researcher was interested in whether the ERP project outcome is differ significantly United States versus other countries. To test the hypothesis, I conducted a multiple regression. The independent variable was a dummy variable that took the value of 1 if the ERP was implemented in the US and 0 otherwise. The control variables were firm size, industry

classification and number of implementations in which that the respondents have participated and the year of implementation. As shown in Table 2c, the coefficient of USA (dummy) is positive and highly significant at the 5% level (.000). This result indicates that ERP implementation is more successful in the United States than in other countries.

Table 2a Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.554[a]	.307	.279	.4262

a. Predictors: (Constant), USADummy, Industry, NumofImpl, Yearofimplementation, FirmSize

Table 2b ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.965	5	1.993	10.971	.000[b]
	Residual	22.527	124	.182		
	Total	32.492	129			

a. Dependent Variable: OUTCOME

b. Predictors: (Constant), USADummy, Industry, NumofImpl, Yearofimplementation, FirmSize

Table 2c Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.489	.163		3.003	.003
	Industry	.007	.013	.041	.543	.588
	Firm Size	-.015	.021	-.053	-.684	.496
	Num.of Impl.	-.020	.017	-.092	-1.194	.235

Year of imple.	-.036	.093	-.030	-.388	.698
USA (Dummy)	.660	.091	.557	7.268	.000

a. Dependent Variable: OUTCOME

3.1.4. Types of Implementation – Single country vs. Multiple Countries

One research interest was investigating whether implementation outcome varies based on the number of countries in which the ERP system is implemented. In other words, the researcher attempted to determine whether variation exists in implementation outcome when ERP is deployed in a single country versus a multiple-country (or global) implementation. Some of the respondents participated only in domestic implementation projects, while others participated in global projects. A multiple regression was conducted to investigate this hypothesis. The independent variable was a dummy variable that took the value of 1 if implementation was in a single country and 0 for multiple countries. As shown in Table 3c, the coefficient of implementation type is positive, but not significant at the 5%. The result indicates that deployment outcome is not dependent on the number of countries in which the ERP systems is deployed.

Table 3a Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.164[a]	.027	-.021	.5070

a. Predictors: (Constant), Position, TypeofImple, Yearofimplementation, Industry, FirmSize, NumofImpl

Table 3b ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.871	6	.145	.565	.758[b]
	Residual	31.621	123	.257		
	Total	32.492	129			

a. Dependent Variable: ProjectSuccessorFail

b. Predictors: (Constant), Position, TypeofImple, Yearofimplementation, Industry, FirmSize, NumofImpl

Table 3c Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.395	.275		1.439	.153
	Industry	.006	.015	.035	.390	.697
	FirmSize	-.001	.026	-.005	-.052	.958
	NumofImpl	-.029	.028	-.130	-1.032	.304
	Yearofimplementation	-.116	.111	-.095	-1.044	.298
	TypeofImple	.163	.132	.155	1.229	.221
	Position	.015	.031	.043	.463	.644

a. Dependent Variable: ProjectSuccessorFail

3.1.5. Implementation Strategy and ERP Implementation Outcome

Based on the data collected from respondents, three types of implementation strategy were identified: roll-out or phased-out deployment, big bang, or both. In a phased approach, the ERP system is deployed gradually to locations based on certain criteria. For example, companies that adopted the phased-out approach have used countries and divisions to phase out ERP deployment in their organization. In contrast, with the big-bang method, the ERP system is deployed in all company locations or divisions at the same time. A multiple regression was conducted to test this hypothesis. As shown in Table 4c, the coefficient of implementation

strategy (with a value of 1 if phased out, and 0 if big bang) is positive and significant at .032. This indicates that companies that adopted the roll-out strategy experienced greater success than companies that favored the big-bang approach.

Table 4a Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.246[a]	.060	.013	.4987

a. Predictors: (Constant), Implementation_strategy, NumofImpl, Position, Industry, Yearofimplementation, FirmSize

Table 4b ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.885	6	.314	1.263	.280[b]
	Residual	29.347	118	.249		
	Total	31.232	124			

a. Dependent Variable: ProjectSuccessorFail

b. Predictors: (Constant), Implementationstrategy, NumofImpl, Position, Industry, Yearofimplementation, FirmSize

Table 4c Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.153	.282		.542	.589
	Industry	.007	.016	.042	.454	.651
	FirmSize	.010	.026	.035	.375	.708
	NumofImpl	-.010	.020	-.046	-.504	.616

Yearofimplementation	-.039	.113	-.032	-.342	.733
Position	.041	.032	.118	1.287	.201
Implementation_strategy	.177	.081	.198	2.175	.032

a. Dependent Variable: ProjectSuccessorFail

Overall, the results of these survey questions and the accompanying regressions demonstrate that ERP implementation outcomes vary by speed of steering committee response to project issues, by country of implementation, and by the implementation strategy chosen. Specifically, companies that implement an ERP system in the United States, organizations in which steering committee members are actively involved and respond to issues in a timely manner, and those that use a phased-out approach are more likely to succeed with ERP implementation.

Chapter 5: Summary of Results

5.1. Introduction

The final chapter provides a summary and discussion of the results of the study. The chapter starts with the discussion of the purpose of the study, followed by the summary of the findings in particular as related to variables of interest. This is followed by the contributions of the study to

information science literature and the limitations of the study, and lastly, the chapter presents a discussion of suggestions for future research in CSF for ERP deployment research.

5.2. Discussion of purpose and findings

The purpose of this study is to examine the relationship between three factors that relate to organization governance structure and ERP implementation outcomes. In particular, this study explores the impacts of the executive steering committee, internal auditor, and change management plan as well as the implementation strategy on the ERP deployment success. The study also investigates whether there are variations in the implementation outcomes across countries.

To understand the importance of CSF to implementation outcomes, this study developed four hypotheses, one for each of the variables of interest. The first hypothesis (H1) tests whether engagement of the steering committee contributes to ERP deployment success. This hypothesis was supported by both the raw data (the responses) and the results of the regression analyses. The results also show four significant findings: almost all projects (97%) have a steering committee whose main purpose is to monitor the progress of the project (87%) regardless of the country of deployment; a significant percentage of steering committee members were VPs of various departments of the company (84%). Lastly, in most organizations, steering committee members respond quickly to issues raised by the project team. Overall, the finding suggests that top-management support is critical to successful implementation. In particular, the results demonstrate that an actively engaged steering committee played an important role in ensuring success. The prevalent finding is that it is not sufficient for an organization to constitute the steering committee to monitor the project and provide leadership for the project, and the results

show that active participation of committee members is crucial. In particular, for the project objectives to be met, steering committee members must be willing and available to resolve the project issues presented to it by the project team in an efficient and timely manner.

The second hypothesis investigates the impacts of the internal auditor role in the implementation process. This hypothesis was not supported either by the responses or the regression results. In particular, less than half of respondents reported having IT internal auditors involved in their project. In addition, only 7% of the respondents considered internal auditor participation as essential to implementation success. Of the projects that had IT auditors' participation, a significant percentage of these professionals helped the project team to review the system and user security configurations. In particular, the reviewed user profiles to ensure that adequate segregation of duties are built into the system to reduce employee theft. They also confirmed that disaster recovery plan and procedure are in place to ensure system and business continuity in case of unforeseen disasters.

The third hypothesis tests to determine the importance of the change management plan and execution in the implementation outcome. In this study, employee resistance, training and communication are used as proxies for change management activities. As part of this analysis, a significant percentage (66%) of participants reported that employee training, involvement, and communication are essential to implementation success. However, in the regression analysis, the coefficient of change management was positive but not significant (p-value = .243). This indicates that employee training does not seem to be that important to successful implementation after taking into consideration other factors that affect the implementation outcome.

Employee layoffs are perhaps the biggest source of employee resistance. The major impact of the improved (more efficient and automated) business processes of ERP systems is that

fewer employees are required to run business operations. In fact, reduction in the labor force (and the resultant cost reduction) is one of the primary reasons (and justifications) for the high costs of ERP implementation. It is not surprising then that most companies that implement ERP end up reducing the size of their work force (through layoffs) to realize the potential cost savings. In addition, the new ERP systems normally require a significant change in employee work behavior. These are some of the factors responsible for employees' negative reactions to ERP deployment. This study found that the impacts of employee resistance in the implementation outcome vary by country and culture. Specifically, employee resistance seems to be high in North American countries than in Europe and Asia. Based on the responses, resistance is muted in Europe due to the influence of labor unions that determine employee layoff. In Asia on the other hand, the resistance is lower than in US because of Asian culture and close ties between management and employees which makes it more difficult for companies to lay off employees. In essence, the likelihood of layoff is higher in US than in Europe and Asia, therefore, the resistance is lower in these countries

The second area of interest for this study relates to cross-country implementation outcomes. To properly understand implementation outcomes by country, the study examined three objectives: (1) to determine whether deployment outcome vary by country, and if so, (2) to identify the factors responsible for the variations, and lastly, (3) to identify countries where ERP deployment is more likely to succeed as compared to countries where successful outcomes are more challenging.

In order to explore whether implementation outcome varies by country, the final hypothesis (H4) compared deployment outcomes by country of deployment. In addition to the CSFs that have been reported by previous, this study investigated whether there are country-

specific institutional factors that can lead to variations in the implementation outcome. Both the raw data and the regression analysis confirmed Hypothesis 4 and found that the implementation outcome varies by country. In essence, ERP deployment efforts are more successful in some countries than in others.

To extend this literature further, the study identifies the countries with the most successful implementation and those countries that find it more challenging to implement the ERP system. Based on participants' responses, the top three countries that find it easier to implement the ERP system (and consequently more successful implementation) are the USA, Germany, and Japan. On the other hand, the three least successful countries in deploying ERP systems are China, Brazil, and India. A distinct factor among these countries is their economic classification: developed and developing. The USA, Germany, and Japan are considered developed economies, while China, Brazil, and India are referred to as developing countries. In essence, the results demonstrate that ERP implementation is more likely to succeed to achieve the desired objectives in developed economies than in developing countries.

One of the subjects of interest is the country institutional factors that are responsible for the variation deployment outcome. The respondents identified country legal or statutory requirements as the number one reason for variations in implementation outcome across countries. These results indicate that, in countries where legal requirements, especially in relation to software deployment, are stricter, companies are less likely to experience ERP implementation success than countries with more IT-friendly statutory rules. In confirmation of these results, additional comments provided by respondents show that China and Brazil enacted one of the most stringent national information policies. In other words, the restrictions and rules

implemented by the governments of these countries create a more challenging environment for the deployment ERP systems in particular and IT applications in general.

5.3. Contributions of the study

This study makes important contributions to our understanding of issues encountered by organizations that have implemented the ERP systems and shed light on the importance of CSF in deployment outcome. Unlike previous studies, this study investigated the CSF from a corporate governance perspective. In particular, this is the first study to draw attention to the role of organizational governance structure on the implementation process. The study extends the literature by focusing on three key CSFs that relate to the structure by which an organization is managed: top-management support, information technology auditor, and change management. Consistent with prior studies, the study demonstrates that the organization leadership structure influenced ERP deployment outcome.

One of the contributions of this study was to shed light on the role of the executive management team in the implementation process. In particular, unlike prior studies that have examined in general the importance of top management support, this study extends the literature by focusing specifically on the critical role played by the steering committee in the implementation process. To my best knowledge, this is the first paper that exposed the ability of the steering committee to influence ERP deployment outcome.

While previous studies have extensively examined CSF in multiple organizations; however, little is known about the variations of ERP implementation outcomes across countries. This paper fills this gap by investigating deployment outcomes by country of implementation. Perhaps the greatest contribution of this study is the emphasis on the international nature of

issues encountered in the ERP deployment. This paper is also the first to investigate the variations in ERP implementation outcome across countries worldwide. Respondents were from developed economies of the Americas, Europe, and the Asian Pacific region, but also from developing countries in Asia, Africa, and the Middle East. In other words, this is the first paper to attract participants from 36 countries of diverse backgrounds and industry affiliations. The diversity of the participants allows for comparison of implementation success across countries. In addition, this study also identifies international institutional factors that are responsible for variations in implementation outcome. The study indicates that companies in various countries faced similar implementation issues and must focus on CSF to ensure success. At the same time, the study found that international differences also influence implementation outcomes. In other words, the findings show that implementing organizations should not only focus on CSF in general, but should also pay particular attention to the unique legal, cultural, and socio-political conditions in their respective countries. In other words, the ERP outcome is the function of organizational-level factors as well as country institutional factors.

5.4. Limitations

Despite the significant contributions of this study to the extant literature on ERP implementation, the study limitations with regard to response bias and the generalizability of the study results. These factors are discussed in detail below.

One potential limitation of this study relates to the generalizability of the study findings, based on the following three reasons. First, data was collected from respondents who were members of one of the ERP professional groups on LinkedIn. Second, the respondents were predominantly from organizations that have implemented SAP (the ERP vendor with the largest

market share). Lastly, the sample size (289 usable responses) is relatively small compared to the size of organizations worldwide that have implemented ERP systems. In other words, the results of this study are based on data that exclude IT professionals and organizations that either have no LinkedIn account or that implemented other ERP systems (such as Oracle, JD Edwards, and others). The implication is that the findings may not be generalizable to organizations outside of these parameters. In essence, the external validity of this study might be weak.

Furthermore, as with all studies that utilize survey as the research method, this study faces the possibility of systematic bias due to the self-reporting nature of the research design. In particular, the participants who responded were mostly IT managers and VPs of IT who were actively involved in the implementation process. It is conceivable that these professionals might be biased regarding the ERP implementation outcome as opposed to managers in other business functions who were not part of the implementation team. In addition, soliciting the perceptions of IT professionals regarding the extent to which the ERP meets business needs introduces the potential for bias. In essence, business managers might not hold the same views regarding ERP deployment success as those of IT managers.

5.5. Future research

Due to the complexities of ERP implementation and the high failure rates, further study is needed to adequately document factors that are essential to deployment success. There are numerous follow-up efforts that could be pursued to extend the findings of this study. I highlight three of these future research areas in this study. First, a potential extension of this study is to investigate the impacts of international institutional factors on ERP implementation. In particular, future studies could examine the effects of country institutional factors such as

country legal origin, language, culture, economic conditions, and the political systems on ERP implementation outcome.

Future studies could also collect data from multiple sources within an organization. While most ERP implementation studies have focused on the IT management perspective of implementation outcome, studies could gather data from business managers and compare their results with that of IT professionals. Furthermore, the use of archival data in addition to the self-report data would provide another means of collecting additional data that can be used to confirm the results of this study.

5.6. Conclusion

Previous literature on ERP implementation has focused on the piece-meal analysis of implementation issues, especially in relation to country of implementation. Overall, the results are consistent with prior studies that reported that CSF is essential for ERP implementation success. This study also demonstrates that CSF is not country specific and that, regardless of the country of deployment, the implementation outcome is a function of the way in which CSF is handled.

The results demonstrate that, when steering committee members are actively involved in the implementation process, the success level of the ERP is also high. The results demonstrate that there are variations in the impacts of various groups within the governance structure on the ERP implementation outcome. In particular, the results show that the steering committee involvement and contributions are more important to successful implementation than IT auditor participation.

The extant literature has mostly focused on the implementation of firms in the US, the UK, most other developed countries, and a few developing countries including Indian and Arab gulf countries. The current study extends the CSF research by examining these factors in a larger and international arena. Specifically, the results show that top-level management support, employee communication and training, as well as good change management plan (as some of the determinants of deployment outcome) are essential to the implementation success. Both the individual responses and regression analysis demonstrate that implementation outcomes do vary by country. The variations are attributed to institutional factors such as national culture, statutory requirements, socio-economic factors, and political environment, among others. In particular, ERP deployment efforts are more likely to succeed in developed countries than in developing economies.

Date:

To:

Dear ……,

I am writing this letter to ask for your help in a survey study on enterprise resource planning (ERP) systems. The purpose of this study is to examine the critical success factors for ERP implementation. Specifically, the goals of this study are to understand:

1. The challenges you experienced during the SAP implementation.
2. The importance of the involvement of internal Auditors in the implementation process.
3. The nature of steering committee participation during the implementation.
4. The change management plan and global implementation strategies used

Your answers to the survey will be kept strictly confidential (kindly do not give your name and contact details in the questionnaire). The names of participating firms and individuals will not be released. Only aggregate results from the answers of the participating respondents will be published.

If you have any questions about this study please feel free to contact me. There are no foreseeable risks involved in this study. By completing this survey you are agreeing to participate in this study. If you have any questions about the study, you may contact me at opo0001@unt.edu or at (281) 969-8247

This doctoral dissertation research is conducted under the supervision of Dr. Maurice Wheeler, Associate Professor in the College of Information at University of North Texas. In addition, this research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-4643 with any questions regarding the rights of research subjects.

Thanks in advance for participating.

Sincerely,

Oluseyi Peter Obitade
Ph.D. Candidate
College of Information
University of North Texas
Denton, TX

Enterprise Resource Planning System Implementation Survey

Please read the disclosure (mandated by the University Review Board) below, then select YES to start the survey...Thank You

Informed Consent Form

You are being asked to participate in a research project conducted by Peter Obitade in College of Information at the University of North Texas as part of his doctoral dissertation study.

PURPOSE: This study will examine the critical success factors for Enterprise Resource Planning Systems implementation

the goal of this study is to understand:
1. the challenges you experienced during the SAP implementation.
2. The importance of the involvement of internal Auditors in the implementation process.
3. The nature of steering committee participation during the implementation.
4. The change management plan and global implementation strategies used

VOLUNTARY PARTICIPATION: Please understand that participation is completely voluntary. You may withdraw from participation at any time during the study. You also have the right to refuse to answer any question(s) for any reason without penalty. Completing the survey will require approximately 10 minutes of your time.

CONFIDENTIALITY: Your individual privacy will be maintained in all publications or presentations resulting from this study. The results of your participation will be recorded by numeric values, No names or individual identifying information will be maintained. With the exception of the researchers involved in running this study, nobody will be allowed to see or discuss any of the individual responses. Your responses will be combined with many others and reported in group form in a presentation and/or a professional journal article.

COMPENSATION: Sorry, there is no compensation for participating in this survey.

By completing the online survey, you are granting informed consent.

If you have any questions or would like additional information about this research, please contact me at opo0001@unt.edu or at (281) 969-8247

This doctoral dissertation research is conducted under the supervision of Dr. Maurice Wheeler, Associate Professor in the College of Information at University of North Texas.

Sg I have read, and understood, the above consent form and will freely participate in this study

- ❍ Yes (1)
- ❍ No (2)

If No Is Selected, Then Skip to End of Survey

Q1: What is your position in the company?

- ❍ President/CEO (1)
- ❍ Director/VP (2)
- ❍ Project Manager (3)
- ❍ Project Lead (4)
- ❍ Team Member (5)
- ❍ SAP/Business User (6)
- ❍ Senior SAP Consultant (7)

Q2: Please select your industry classification

- ❍ Energy (1)
- ❍ Banking and Finance (2)
- ❍ Technology (3)
- ❍ Manufacturing (4)
- ❍ Pharmaceutical (5)
- ❍ Retail (6)
- ❍ Telecommunication (7)
- ❍ Utilities (8)
- ❍ Technology Consulting (9)
- ❍ Others (Please Specify) (10)

Q4: What is name of company?

Q5: What is your current country of residence?

Q5: Please select your approximate company income

- ❍ $0 to $10 Million (1)
- ❍ $10 to $100 Million (2)
- ❍ $100 to $500 Million (3)
- ❍ $500 to $1 Billion (4)
- ❍ $1 Billion to $5 Billion (5)
- ❍ Over $5 Billion (6)

Q6: Please list the country (s) where you've participated in SAP Implementation

Q7: What region(s) were included in the SAP implementation (Please check all that apply)

Q8: When was the SAP implementation completed?

- ❍ 1 - 5 years (1)
- ❍ 6 - 10 years (2)
- ❍ Over 10 years (3)

Q9: Which of the following were the reasons for implementing SAP (choose all that apply)

- ❑ Financial reasons (e.g cost savings) (1)
- ❑ Process Automation /redesign (2)
- ❑ Support Business Growth (3)
- ❑ Better Reporting/Business Analysis (4)
- ❑ Increase productivity (5)
- ❑ Others (Please Specify) (6) _____

Steering Committee participation

Q9: Was there Steering Committee present in most of the ERP projects you participated in?

- YES (1)
- NO (2)
- NOT SURE (3)

Q10: Who were the members of the Project Steering Committee?

- CEO (1)
- President (2)
- Vice President (VP) (3)
- Director (4)
- Senior Manager (5)
- Others (6)

Q11: How important is the Project Steering Committee Involvement in an SAP Project?

- Extremely Important (1)
- Very Important (2)
- Somewhat Important (3)
- Neither Important nor Unimportant (4)
- Not at all Important (5)

Q12: What role did the Steering Committee played in the implementation? (select all that apply)

- ❑ Monitor the project progress (1)
- ❑ Approve project budget (2)
- ❑ Assist resolution of project issues (3)
- ❑ Provide project resources (4)
- ❑ Servers as project champion (5)
- ❑ Others (please specify) (6) _____

Q13: How responsive were the Project Steering committee members to issues raised during the implementation

- ❍ Quick/timely response (1)
- ❍ Somewhat slow response (2)
- ❍ Slow response (3)
- ❍ Very slow response (4)
- ❍ No response (5)

Internal Auditor Involvement

Q14: Were the Internal Auditors involved in your SAP Project?

- ❍ Yes (1)
- ❍ No (2)
- ❍ Comments (3) _____

Q15: If yes, what role did Internal Auditor played in the implementation?

- ❑ Team Member (part of the team) (1)
- ❑ Consulted only when needed (2)
- ❑ Review pre & post implementation (3)
- ❑ Not involve / No role (4)
- ❑ Comments (5) _____

Q16: How important is Internal Auditor involvement in SAP Project?

- ❍ Extremely Important (1)
- ❍ Very Important (2)
- ❍ Somewhat Important (3)
- ❍ Neither Important nor Unimportant (4)
- ❍ Not at all Important (6)

Q17: In your opinion, can Internal Auditor be objective and independent if they are active member of the SAP project Team?

- ❍ YES (1)
- ❍ NO (2)
- ❍ NOT SURE (3)

Change Management Plan and implementation

Q18: In most of your implementation, how significant (or difficult) is employee resistance?

- ❍ Extremely significant (1)
- ❍ Somewhat Important (2)
- ❍ Not significant (3)
- ❍ Comments (4)

Q19: In your opinion, what were the reasons for employee resistance in your project (select all that applies)?

- ❑ Fear of layoff (employment termination) (1)
- ❑ ERP system too expensive (2)
- ❑ Stress associated with learning new technology (3)
- ❑ Current / legacy systems function well (no need for new system) (4)
- ❑ Others (please specify) (5)

Q20: How did the employees displayed/demonstrated their resistance to the project

- ❑ Lukewarm or hostile attitude towards the project (1)
- ❑ Reluctant to learn the ERP system (2)
- ❑ Provide poor data from legacy systems (3)
- ❑ Spread false gossips/rumors about the project (4)
- ❑ Others (please specify) (5)

Q21: In your opinion, how effective is the change management plan/implementation at reducing or mitigate employee resistance?

- ❍ Extremely effective (1)

- ❍ Somewhat effective (2)
- ❍ Not effective (3)
- ❍ Comments (4)

Q22: If you participated or managed ERP implementation project in multiple (or more than one country), in your opinion, do the employee resistance varies by country?

- ❍ YES (1)
- ❍ NO (2)
- ❍ NOT SURE (3)

Q23: If the answer to the previous question is YES, what factors are responsible for the variations/differences?

- ❑ Country culture (1)
- ❑ Influences of labor unions (2)
- ❑ Legal system (3)
- ❑ Employee/employer relationship (4)
- ❑ Level of education (5)
- ❑ Others (please specify) (6)

Global Implementation Strategies

Q24: What was the implementation strategy used in most of the SAP deployments you managed?

- ❍ Big Bang (1)
- ❍ Phased approach (2)
- ❍ Both (3)
- ❍ Comments (4)

Q25: What is the reason for the chosen strategy?

- ❑ Project risk (1)
- ❑ Ease of implementation (2)
- ❑ Time constraint (3)
- ❑ Complexity of ERP implementation (4)
- ❑ Others (please specify) (6)

Q26: Were you satisfied with the results of chosen strategy?

- ❍ YES (1)

- ❍ NO (2)
- ❍ NOT SURE (3)

Overall project outcome

Q27: On average, the ERP implementation project (s) that I managed or participated in was: (*Very successful* if: project was completed on time, on budget and meet business objectives: *Somehow successful*: if project achieve only 2 of the 3 measurements of success; *Not successful*: if project only meet one or none of the measurements)

- ❍ Very successful (1)
- ❍ Somehow successful (2)
- ❍ Not successful (3)
- ❍ Comments (4)

Q28: If successful, what were the metrics (select all that apply)

- ❑ Implemented on time (1)
- ❑ On Budget (2)
- ❑ Meet user expectation (3)
- ❑ Better System than Legacy System (4)
- ❑ Others (please specify) (5) _____

Q29: If successful, what were the contributing factors? (Please select all that apply)

- ❑ Steering committee engagement (1)
- ❑ Internal Auditor Involvement (2)
- ❑ Management support (3)
- ❑ Project Team performance (4)
- ❑ Employee involvement & Training (5)
- ❑ Others (Please specify) (6) _____

Q30: If NOT successful, what were the major reasons (Please select all that apply)

- ❑ Lack of management support (1)
- ❑ Steering committee not actively involved (2)
- ❑ Employee Resistance (3)
- ❑ Poor Project team performance (4)
- ❑ Noninvolvement of Internal Auditor (5)
- ❑ Inadequate Employee Training (6)
- ❑ Other reasons (please specify) (7) _____

Q31: Which of the following were the reasons for implementing SAP? (Choose all that apply)

- ❑ Financial reasons (cost savings) (1)
- ❑ Process automation and efficiencies (2)
- ❑ Support business growth (3)
- ❑ Better reports and audits (4)
- ❑ Increase productivity (5)
- ❑ To be competitive (6)
- ❑ Other reasons (please specify) (7) _____

Q32: Rank the 5 factors below in order of importance to success of your project (1 - lowest, 5 - highest)

_____ Internal Auditor involvement (1)
_____ Steering Committee participation (2)
_____ Management support (3)
_____ Employee Training (4)
_____ Change Management plan (5)

Global Implementation results

Q33: What region (s) were included in the SAP implementation (Please check all that apply)

- ❑ North America (1)
- ❑ South America (2)
- ❑ Europe (3)
- ❑ Asia (4)
- ❑ Africa (5)
- ❑ Middle East (6)
- ❑ Not applicable / Do not know (7)

Q34: If you participate in a global (multiple countries) SAP implementation, which country (s) will you considered most difficult to implement?

Q35: Did the implementation success or failure vary by country?

- ❍ Yes (1)
- ❍ No (2)
- ❍ Comments (3) _____

Q36: If your answer to the previous question is yes, in which country (s) was SAP implementation more successful?

Q 37: In which of the country (s) was SAP implementation not or less successful?

Q38: What are the contributing factors for success or failure in one country as compare to others? (Select all that apply)

- ❑ Legal or statutory requirements (1)
- ❑ Political environment (4)
- ❑ Language barriers (2)
- ❑ Availability of skilled consultants (3)
- ❑ National or Country culture (5)
- ❑ Others (please specify) (6) _____

Q39: What other pitfalls will you advise other companies planning to implement SAP to avoid?

Q40: Any suggestions to improve this survey or final comments?

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