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An Examination of User Resistance in Mandatory Adoption of Enterprise Systems

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An Examination of User Resistance in
Mandatory Adoption of Enterprise Systems

by

Timothy Paul Klaus

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
Department of Information Systems and Decision Sciences
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ABSTRACT

User resistance is an important issue in the implementation of an Enterprise System (ES). However, despite the prevalence of user adoption literature, user resistance literature is scarce. Although some studies have conceptualized user resistance as the opposite of user adoption, a mandatory, role-transforming system such as an ES clearly shows that users may use a system while resisting it. Although this area is highly relevant, it is theoretically underdeveloped. This study examines user resistance at the individual level of analysis to determine the underlying reasons for user resistance, the types of resistant behaviors, and the management strategies to minimize resistance. It also seeks to understand the types of users that exist during an implementation and in particular, the groups of resisters. This dissertation identifies four categories of reasons for user resistance, which comprise a total of twelve reasons for user resistance. Resistant behaviors are also identified and classified. Three categories of management strategies are also identified, comprising a total of eight management strategies that are useful in minimizing user resistance. Groups of ES users are also described and examined.

CHAPTER I. INTRODUCTION

User resistance is an important, yet relatively understudied domain in system implementations. In particular, user resistance generally is exhibited during and after large system installations that affect the way users perform their jobs. This chapter first describes the motivation behind examining this area, which includes a description of the context and overview of the area. Next, the research questions for this dissertation are identified and described. Third, the expected contributions of this dissertation are identified.

Motivation

Enterprise Systems (ESs) are software packages used for integrating and managing business processes across organizational activities and are widely deployed in organizations from numerous industries. ESs refer to commercial software packages that enable the integration of business processes and transaction-oriented data throughout an organization (Markus, Axline, Petrie and Tanis 2003). They include organizational-wide software such as Enterprise Resource Planning (ERP) systems, scheduling, customer relationship management, product configuration, and sales force automation (Markus and Tanis 2000). Not only are increasing numbers of organizations installing full ESs or ES modules, but also organizations currently using ESs are expanding their use. AMR

Research estimates that the ERP market alone will grow to 31.4 billion by 2006, at a rate of 10 percent annually (Surmacz 2002).

ESs have evolved from production planning and control to integrating all parts of an organization with suppliers and customers. Typically, an ES has a suite of software modules available for business functions, such as inventory management, accounting, scheduling, and forecasting. Smaller firms tend to implement several modules or components of modules while larger organizations more often install a larger number of available modules (Chalmers 1999; Ferman 1999). The integration of these functions provides management with tools to better monitor and plan for changing business conditions. A clear benefit of ESs is the level of interoperability that allows for improved management decision-making and monitoring that is expensive or difficult to attain with custom-built systems. Another benefit is that ES vendors often model their software after “best practices” and thus an organization’s business processes can be improved through alignment with these practices. Markus et al. (2000, p. 180) describes 23 technical and business reasons as to why organizations choose to adopt ESs. Interestingly, the reasons for adoption that are listed benefit the organization, such as providing a greater business profit, but do not directly benefit end-users.

ESs have gained credibility as their widespread implementations have led to the creation of more stable and adaptable systems and improved management tools. Through removing inefficiencies in business processes, ESs have led many organizations to greater profitability. In fact, Hitt, Wu, and Zhou (2002) found that financial markets have

consistently rewarded adopters through an increased market valuation. ES implementations are important as they are pervasive, ongoing and require a fair amount of compliance as well as job transformation. These large-scale projects require changes that upset the status quo of individuals in the organization. Successful implementations remain a daunting issue as numerous articles report on implementation catastrophes as well as implementations that have failed to provide projected benefits (i.e., Bingi, Sharma and Godla 1999; Robey, Ross and Boudreau 2002). Many projects cover spans of multiple years and incur millions of dollars yet yield poor results (Stein 1999; Dryden July 27, 1998). One important reason for this is user resistance (Jiang, Muhanna and Klein 2000).

User resistance is an important issue in ES implementations and has been said to be “at the root of many enterprise software project failures” (Hill March 26, 2003, p. 1). For example, Callahan (2002) found a significant amount of user resistance even after nine months of ERP integration testing, partly due to the many interfaces with existing systems. Maurer (2002) finds that the reason for low ES return on investments is user resistance. Hines (2002) notes that since end user resistance often is cited as an important cause of organizations failing to achieve projected benefits, PeopleSoft, an ES vendor, purposely made user-related improvements in version 8.8. Furthermore, a report on 186 companies that implemented the SAP ES found that resistance is the second most important contributor to time and budget overruns and is the fourth most important barrier to SAP implementation (Cooke and Peterson 1998). Additional studies also

reveal how users' resistance causes ES implementation failures (Krasner 2000; Wah 2000; Robey et al. 2002; Umble and Umble 2002; Barker and Frolick 2003).

Although user resistance is an important issue, especially in ES implementations, Marakas and Hornik (1996) points out that "few theoretical foundations currently exist in the literature for explaining user resistance" (p. 209). Although studies in other fields have examined resistance to change, the concept of user resistance still lacks a theoretical underpinning as to its cause. Yet, it is important for management to understand user resistance since it indicates an underlying problem with an implementation. Although there are some IT studies which describe user resistance (i.e., Jiang et al. 2000; Shang and Su 2004), IT studies have focused much more on user acceptance rather than user resistance. This is understandable as many types of systems or technologies have voluntary acceptance and thus user resistance is not an issue. Unfortunately for ES research, user acceptance models fail to account for the mandatory and job transforming nature of ES implementations.

Although there is a lack of theoretical foundations, user resistance remains an important and relevant issue faced by numerous organizations. User resistance must be reduced in order to reap efficiency benefits, particularly for systems that transform business processes such as ESs. As an ES is used to transform an organization by fundamentally changing business processes, user resistance can greatly affect an ES implementation. A model of user resistance could lead to improved implementation strategies and results.

Nature of ES Implementations

One of the major benefits of an ES implementation is efficiency achievements through process reengineering. However, the process reengineering also can be a catalyst for user resistance. An ES is only a tool, yet as a master craftsman uses a chisel to carve a piece of wood, management can use an ES to chip off the inefficiencies from the organizational processes. While other systems may only automate existing processes, effective ES use not only changes organizational technologies, but through redesign, fundamental business processes are transformed. Cooper (2000) found that IT can be used as an effective reengineering tool, although the appropriate creative organizational climate is required.

There are several key differences between an ES implementation and other types of system implementations. First, ESs require mandatory usage throughout all affected levels of the organization. Mandatory usage is necessary for the system to integrate the data and produce organizational snapshot and trend analysis reports. Second, an ES implementation generally results in the reengineering of jobs, often requiring changes in job tasks and reward structures. A clear benefit of and reason for ES implementation is the efficiency gains through process reengineering and thus these changes are made during the system implementation. Third, in order to minimize cost and time of future upgrades, standardized modules are only partially customized for employees as opposed to a full customization that may be performed for software produced in-house. Customization is only minimally performed since every upgrade that an ES software

vendor delivers also needs to be customized, thus increasing both initial and future costs. Due to these increased costs, managers are discouraged from making modifications unless they are absolutely necessary.

Because of the three contextual differences noted above, the end-user's perceived usefulness and perceived ease of use is not a priority; rather, the goal of implementation is to achieve efficiencies through reengineered processes and provide better organizational reports to managers for improved decision-making. This inherent nature of ES revolves around the business processes, not the user, and can both breed and proliferate resistance. A business process has been defined as "a set of logically related tasks performed to achieve a defined business outcome" (Wu 2003, p. 2). Business process reengineering received much attention around 1990 (Hammer 1990; Hammer and Champy 1993) by both systems and business people and has been defined as "The fundamental rethinking and radical design of business processes to achieve dramatic improvement in critical, contemporary measures of performance such as cost, quality, service, and speed" (Maurer 2002, p. 2). Reengineering can entail eliminating or transforming organizational processes and change the way transactions are performed with suppliers and customers. ESs are not needed for reengineering, but one main benefit of an ES is the process reengineering that occurs as the technology is implemented.

Employees can be greatly affected by the job transformation caused by the ES implementation. This transformation is often difficult, as found in Alvarez and Urla (2002), which suggests that users have values, work habits, and dilemmas that carry over

and challenge the new system. This readjustment usually causes a temporary reduction in performance (Hitt et al. 2002), and unresolved resistance can cause a much greater problem (Jiang et al. 2000). Because of this transformation, along with the other previously identified characteristics and features of mandatory, role-transforming systems, studies examining other types of systems may not be applicable in explaining the response of users in an ES context. Yet it is vital for management to not only have employees use the system, as resistance can devastate the implementation, but also embrace the system in order to reap the full benefits. In regards to resistance, Ross and Vitale (2000) describes how resistance took place in many forms since some users' jobs significantly changed, some lost power, and most had to unlearn as well as relearn. Essentially, an ES implementation requires organizational change, which often alters the tools, skills, rewards, tasks of the job, organizational structures, and even beliefs and values.

Overview of ES Studies

As described in the previous paragraphs, ES implementations necessitate some degree of organizational change. As these systems often are vital to an organization's long-term success, understanding the nature of user resistance is important. A research stream on ESs has developed in the last several years because of their importance to organizations. These systems are important to study not only because of their contextual differences but also because of the following: 1) ES implementations are very costly; 2) there have been many ES failures; 3) an ES is a long-term investment made to increase

efficiencies and provide better management tools necessary for many organizations operating today.

Trade publications have featured many ES-related articles, but despite the importance of ESs, Esteves and Pastor (2001) notes that academic research publications on the topic have only started appearing recently. In regards to academic research, Robey et al. (2002) identifies two streams of ES variance research: studies focusing on antecedents to success and studies examining a succession of ES-related events. For example, variance research generally includes an antecedent research stream of critical success factors for ES (Esteves and Pastor 2001). Studies examining a succession of ES-related events include process model research, such as 3-stage (Bhattacharjee 2000; Gosain 2004; Gattiker and Goodhue 2005), 4-stage (Dong 2001; Gosain 2004), and 5-stage (Martinsons and Chong 1999; Ross and Vitale 2000) models. Publications that fit in this stream are often case studies and interviews to understand the processes through which an organization traverses. There are also other issues related to ES implementations that are highlighted in the literature, such as the transition of power that occurs through the process changes (Sia, Tang, Soh and Boh 2002) and the potential problem of misalignment between organizational structures and an ES package (Soh, Sia, Boh and Tang 2003).

The number of ES-related research publications has increased in the last several years. However, in spite of the recent increase in these publications, few studies have examined user resistance in the ES context. This is of particular interest not only because

of the wide-spread uses of ESs, but because studies show that the type of technology affects the type of resistance (Kendall 1997; Jiang et al. 2000). Thus, the reasons for user resistance to an ES implementation likely differ from user resistance to other types of systems. Also, the ES literature lacks studies focused on the individual and the change that is faced by employees through the implementation of an ES. Furthermore, there is a lack of studies that examine management strategies in minimizing user resistance.

Research Questions

Due to reports that address the failure of ES implementations and the importance of minimizing user resistance (i.e., Krasner 2000; Callahan 2002; Maurer 2002; Hill March 26, 2003), a better understanding of user resistance is needed. In previous paragraphs, the context of ES implementations has been described. As user resistance is an issue affecting most ES implementations, it is important to examine this area. All resistance does not hurt an organization and there are valid reasons as to why users both passively and actively resist system/software implementations (Keen 1981); in fact, Fiorelli and Margolis (1993) argues that some level of resistance can be beneficial to the organization as it may draw attention to problems in the change and to address unresolved system issues. There is a difference between resisting a system that an employee believes will make the organization worse off and resisting due to selfish ambitions; however, in either case, the employee is resisting and thus hindering the implementation of the system. Whether or not resistance is beneficial in specific cases, it must be addressed so that proposed changes can either be effectively implemented or modified. Understanding the reasons as to why users resist can help in identifying

important underlying issues that will ultimately help to bring a greater degree of long-term success for the company. Following are the first two research questions:

- 1) Why do users resist an ES implementation?
- 2) How does user resistance manifest itself in an ES implementation?

From a manager's perspective, it is important to understand user resistance so that strategies can be implemented to minimize user resistance. For example, through understanding the underlying reasons for user resistance, managers can make appropriate modifications to a rollout plan. These strategies are important, yet few studies examine management strategies in minimizing user resistance. However, management's perspective has been shown to be important, exhibited through Table 1 of ES studies that have identified critical success factors. These studies identify tangible critical success factors upon which management can build ES implementation strategies.

Table 1: Studies identifying ES Critical Success Factors

Source	Type	Critical Success Factors
Rao (2000)	Case Study	Infrastructure resources planning, local area network, servers, PCs, training facilities, human resources planning, education about ERP, commitment to release the right people, top management's commitment, commitment to implement "vanilla version", well-working manual systems, strategic decision on centralized versus decentralized implementation.
Gupta (2000)	Survey of ERP companies	Securing top management commitment, forming cross-functional task forces, assessing hardware requirements, deploy the system step-by-step rather than all at once, early planning for user training and support, streamlining decision making to move implementation quickly, and being patient as ERP implementation takes time.
Cissna (1998)	Interview	Top management support, heavy involvement of users, assignment of best people to implementation teams
Stratman and Roth (2002)	Survey of ERP users	Strategic IT planning, executive commitment, project management, IT skills, business process skills, ERP training, learning, change readiness, and improved business performance
Nah and Lau (2001)	Literature Review	ERP teamwork and composition, top management support, business plan and vision, effective communication, project management, project champion, appropriate business and legacy systems, change management program and culture, business process reengineering and minimum customization, software development, testing and troubleshooting, monitoring and evaluation of performance
Akkermans and Van Helden (2002)	Surveyed managers to identify the top 10 CSFs	Top management support, project team competence, interdepartmental cooperation, clear goals and objectives, project management, interdepartmental communication, management of expectations, project champion, vendor support, and careful project selection.
Willcocks and Sykes (2000)	Multiple Case Studies	Business themes, new business model and reengineering drives technology choice, senior-level sponsorship, championship, support and participation, "dolphin" multifunctional teams, time box philosophy, regular business benefits, CIO as strategic business partner, nine core IT capabilities retained/being developed in-house, in-house and insourcing of technical expertise preferred, supplier partnering--strong relationships and part of team, ERP perceived as

		business investment in R&D and business innovation rather than primarily as a cost-efficiency issue.
--	--	--

Although the critical success factors revolve around issues that management can control, it is interesting to note from this table that each study has identified different critical success factors. This may be because of the different contexts in which these systems are studied as well as different research participants that identified the critical success factors. The identification of success factors is not new. In fact, general systems implementation literature has identified a number of factors that management can manipulate which can ultimately affect the success of an implementation. Some of these factors include politics (Markus 1983), user involvement (Blake and Olson 1984; Baronas and Louis 1988; Barki and Hartwick 1989), communications between developers and end users (De Brabander and Thiers 1984), end-users' expectations (Ginzberg 1981), and end-user attitude (Robey 1979). Larsen (2003) identified several hundred antecedents of information system success. Many of these antecedents, however, are based only specific contexts and are not relevant to the ES context.

In spite of the numerous factors identified that management can influence or control, many systems still fail completely or fail to provide the anticipated benefits. Since there are different technologies that are used and these systems are implanted into different organizational cultures and structures, there are many reasons why a system may fit well into one organization yet fail in another organization. Since this paper is focused on user resistance of an ES, the management strategies and factors that

management influence are examined regarding their effectiveness in minimizing the level of user resistance.

Management can increase the probability of a successful system through proactively enacting management strategies to minimize user resistance. If there are unresolved issues, resistance will remain and thus management should strive to identify those issues and respond appropriately. Through enacting effective strategies, management could decrease the level of resistance. Thus, the third research question is:

3) In the ES context, what management strategies are effective in minimizing user resistance?

A number of studies have identified user groups. For example, Jurison (2000) found that perceptions of technology and adoption rates varies among types of users. Zhang and Han (2005) also examines different types of users and found that there are differences among stereotyped groups. Ranchhod and Zhou (2001) identifies sets of user patterns among Internet users. Furthermore, Chen and Chen (2005) derive profiles of types of users in a recommendation system. It is very likely that in the implementation of an ES, types of users also exist. In regards to user resistance, it is also very likely that types of resisters exist. To further understand user resistance, it is important to understand these groups.

There may be some groups that are supportive of the system while others are resistant. Through understanding the types of users that exist, management will be more prepared to set forth effective strategies to minimize resistance. Furthermore, an understanding of the types of users also leads to an understanding of why users are supportive of the system.

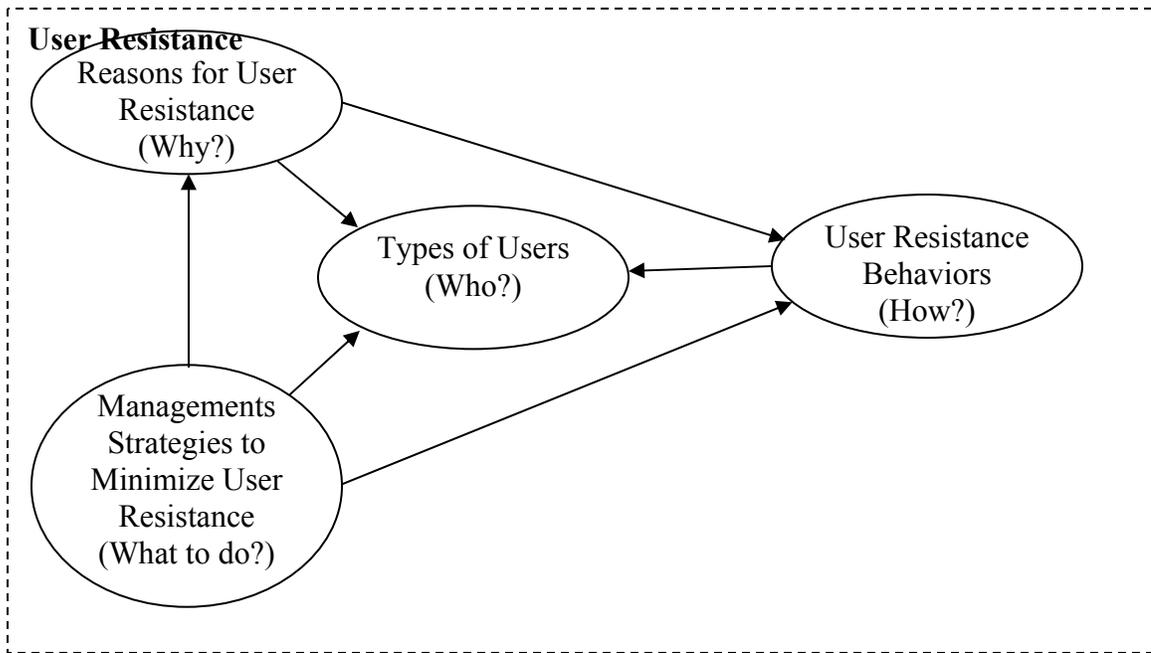
A fourth research question is proposed to understand the types of users that have similar resisting viewpoints.

- 4) What types of users exist in an ES implementation?
 - a) What are the characteristics of these naturally occurring types of users?
 - b) What types of resisting users exist in an ES implementation?
 - c) What are the management strategies identified by these groups that will be most effective in minimizing the level of resistance?

Conceptual Model

This paper revolves around user resistance in an ES context. As mentioned in the beginning of this chapter, user resistance to an ES is an important, yet minimally studied area. The four research questions all revolve around user resistance in an ES implementation and are identified in Figure 1 below:

Figure 1: Conceptual Model



This chapter has introduced user resistance, the nature of an ES implementation, an overview of ES studies, and research questions. Chapter II reviews the literature that can be used to address the four research questions. In regards to each question, a classification of the literature is provided. Second, approaches are provided for various research streams that can be used as lenses to address the research questions.

Since previous studies have not focused on user resistance to an ES, this is an exploratory study to understand the reasons for user resistance, user resistance behaviors, and the management strategies to minimize user resistance. Due to the exploratory nature of this study, a qualitative approach serves best in answering the first three research questions and is described in chapter three. In chapter four, a primarily quantitative study is described which addresses the fourth research question. This research encompasses a

multi-method approach, similar to the qualitative data collection followed by the quantitative data collection that is utilized by Koh, Ang, and Straub (2004).

CHAPTER II. REVIEW OF LITERATURE

ES implementations require a high level of support from people throughout the organization. The lack of support is shown through user resistance, which is an important issue faced by top management in the implementation of an ES. This literature review first examines the literature on user resistance, including user resistance behaviors. Next, studies that address the management strategies in minimizing user resistance are examined.

User Resistance

This paper defines user resistance as “users’ opposition to system implementation.” User resistance often results from a mismatch between management goals and employee preferences. Studies generally have considered resistance to be the flip side of acceptance. However, apparent acceptance may be masked by passive types of resistance (Marakas and Hornik 1996). For example, non-use of mandated systems, such as an ES system, would only suggest blatant disregard for management policies and would likely result in sanctions. More likely, systems would be resisted through covert actions, such as procrastination, “forgetting” certain tasks, or slow performance (Marakas and Hornik 1996).

In the following paragraphs, the IS literature related to system acceptance and resistance is addressed to clarify the distinction between user acceptance and user resistance and the theoretical roots of these concepts. In order to gain further insight into user resistance, the literature regarding the voluntariness of a system is also examined and its applicability is assessed. Several well-used models and theories are identified and described as to their relevance to user resistance in an ES implementation setting, which mandates use. Second, three approaches to user resistance are described and evaluated. Third, studies that have examined reasons for user resistance are examined. Fourth, non-IS literature related to resistance to change is also brought in to add to the limited studies available in the IS literature. Finally, this section analyzes the studies identifying user resistance behaviors.

User Acceptance vs. User Resistance

There is an extensive body of research that has focused on system acceptance in voluntary settings. For example, the Theory of Reasoned Action (Ajzen and Fishbein 1980), the Technology Acceptance Model (TAM) (Davis 1989; Mathieson 1991; Taylor and Todd 1995), and the more recent Unified Theory of Acceptance and Use of Technology Model (Venkatesh, Morris, Davis and Davis 2003) have their roots in the context of voluntary adoption. These studies have consistently found relationships between beliefs, attitudes, behavioral intentions, and usage behavior and focused on the initial decision on whether to use a system. An important distinction between the context of these studies and the context of an ES implementation is that voluntary adoption is not an option for ES users. Since the theories noted above were developed in the context of

voluntary adoption to explain the acceptance of an innovation, they are not advantageous to use in studying user resistance in a mandatory context. Furthermore, the focus of studies using these theories revolved more around behavioral intention, and thus the cognitive processes, rather than actual behavior.

Another theory is Innovation Diffusion Theory (Rogers 1976), which has its foundation in the communication literature and revolves around the spread of an innovation. This theory also has its roots in voluntary adoption and is not applicable to the ES context because of the mandatory nature of an ES implementation.

There are several studies that have applied some of the user acceptance models to mandatory settings and have found mixed results. For example, Hartwick and Barki (1994) examined voluntariness as a moderating construct and found that the level of user participation and involvement depends on the level of voluntariness. Bagchi, Kanungo, and Dasgupta (2003) expanded on the Hartwick et al. (1994) model and evaluated user involvement, concluding that there are a number of sources that influence a user's view. Venkatesh and Davis (2000) also considers mandatory adoption, and extends TAM to test its usage in both voluntary and mandatory settings, finding significant relationships to support TAM (Venkatesh and Davis 2000). However, more recently, Brown, Massey, Montoya-Weiss, and Burkman (2002) found non-significant results for some of the relationships in the TAM and that attitude is not related to behavioral intention in a mandatory use environment. Although both Brown et al. (2002) and Venkatesh et al. (2000) examine mandatory usage, one difference between the studies is that Venkatesh et

al. (2000) does not account for the degree of system integration or the level of accountability.

The preceding paragraphs indicate that the level of voluntariness, based on the type of system, affects the level of user acceptance or resistance. In regards to user resistance, it is also likely that the context of the system affects the level of resistance. The previously mentioned studies examine mandatory adoption, but none of the studies revolve around ESs, that by nature are mandatory and transform jobs. On the surface it appears that the Technology Acceptance Model applies to both voluntary and mandatory contexts. However, in situations such as an ES implementation, not only is the use mandatory, but it often radically transforms the job description/responsibilities of the user. Theories such as the Theory of Reasoned Action, the Technology Acceptance Model, the Unified Theory of Acceptance and Use of Technology Model, and Innovation Diffusion Theory are not designed for the ES context. Moreover, these theories and studies are not designed to focus on user resistance. Consequently, their applicability is limited in considering the issue of user resistance to ESs. In the following paragraphs, the literature related to user response to system implementations is examined for its applicability to user resistance in the ES environment. More specifically, an examination is made regarding how users respond to system implementations across system types.

The system type may affect the way people respond to a system, yet few studies have examined how the type of system affects user response. Jiang et al. (2000) investigates resistance across system types and finds that the managers who responded to

the survey identified different types of resistance, depending on the system type.

Fichman (1992) also notes that there are different types of systems, and classifies systems based on locus of adoption (Individual vs. Organization) and class of technology (high knowledge burden or high user interdependencies vs. low knowledge burden or low user interdependencies). This classification is useful in identifying different types of systems. However, studies have not shown how the voluntariness as well as the transforming nature of a system affects user resistance.

Based on Zuboff (1988) and Schein (1992), there are three general uses for technology: automate, informate, and transform the organization. For example, a system can *automate* existing processes, which can make jobs easier and reduce the costs of operation. It can also be used to *informate*, which includes providing information to enable a job to be performed, such as improving the collection, processing, and dissemination of information that essentially improves the way by which a job is performed. Lastly, it can be used to *transform*, which includes redefining the firm and/or supply chain and transforming the tasks performed, the type of job, and the reward structure. Figure 2 suggests six categories of system implementation research based on the necessity of adoption and the level of process change.

Figure 2: System Conversion Contexts

Necessity of Adoption Voluntary ↑ ↓ Mandatory	1	2	3
	* Electronic Brainstorming System	* Internet Technologies to Support Teaching	
	4	5	6
	* Payroll System * CAD system * Check Clearing System	* Inventory Management System * Sales Analysis System	* ERP System * Customer Relationship Management System
	Automate	Informat	Transform
	Process Change		

Most of the user acceptance studies have examined system implementations fitting into category 1 and 2, with some studies that fit into category 4 or 5. A category 3 implementation is rare as most organizations require adoption if they reengineer processes. Category 6 implementations occur frequently as ES implementations generally entail reengineered processes. However, most user acceptance research has not examined the effects of requiring users to use a system that radically transforms their job. Table 2 expands on the categories of Figure 2 by providing a sample of studies that fit into the categories. The sample was selected from a wide variety of studies examining different types of systems and different contexts to identify the types of systems that fit into the six categories. The lack of research involving category 6 system implementations along with few studies that have examined user resistance presents the opportunity for theoretical development.

Table 2: A Sample of Studies Examining System Implementations

Study	Type of System	Variables	Method of Measurement	Results	Comments	Category
Todd and Benbasat (1999)	DSS	IV-Cognitive Effort and Incentives DV-Strategy	DSS kept track of what user commands	Cognitive Effort affects strategy selection	Voluntary adoption, students in lab setting	1
Dennis and Reinicke (2004)	Electronic Brainstorming	IV-Type of Brainstorming DV-Effectiveness	Survey, Likert-type scale	Some significant differences in outcomes depending on the type of brainstorming used	Voluntary, Lab setting	1
Lewis, Agarwal and Sambamurthy (2003)	Internet Technologies to support teaching	IV – institutional factors, social factors, individual factors DV-Ease of Use, Perceived Usefulness	Survey, Likert-type scale	Institutional and Individual factors affect ease of use and perceived usefulness, but not social factors	Voluntary adoption	2
Joshi and Lauer (1998)	Computer-Aided Design (CAD)	Case Study – examines the impact of CAD implementation	Qualitative Data	Some factors affect user evaluation and acceptance	Mandatory adoption	4
Yoon, Guimaraes and O’Neal (1995)	Expert System	IV-Developer skill, End-user characteristics, Shell characteristics, User involvement, Problem Difficulty, Domain Expert Quality, Management Support DV-User Satisfaction	Survey, Likert-type scale	All relationships are supported	Assumes it is a mandatory adoption since project managers working with expert systems are surveyed	5
Brown et al. (2002)	Computer Banking System	IV-Perceived Usefulness, Perceived Ease of Use, Perceived Behavioral Control, Subjective Norm DV-Attitude, Behavioral Intention	Survey, Likert-type scale	Perceived Usefulness affects Attitude, and both Perceived Behavioral Control and Subjective Norm affects Behavioral Intention	Mandatory adoption (BPI)	5
Somers, Nelson and Karimi (2003)	ERP	Performed CFA of End-User Computing Satisfaction: examined Content, Accuracy, Format, Ease of Use, and Timeliness	Survey, Likert-type scale	The End-User Computing Satisfaction instruments maintains psychometric properties in ERP domain	Sampled users of ERP systems (not examining the implementation)	6

In the following section, three approaches are described from the IS-literature that have been used to examine user resistance. These paragraphs describe the three approaches.

Three Approaches that Explain User Resistance

Few theoretical perspectives have been offered to explain the phenomenon of user resistance. However, for the studies that have examined user resistance, there have been three general approaches that have been taken. These categories were first articulated and developed by Markus (1983) although they have since been expanded. Markus (1983) identifies these three perspectives: 1) system-oriented; 2) people-oriented; and 3) interaction-oriented. Similar to these three approaches is the technological, organizational, and emergent perspectives addressed by Markus and Robey (1988). These perspectives are essentially lenses through which researchers can investigate issues. For example, Jaspersen, Carte and Saunders (2002) used these three lenses to examine the structure between technology and organizational power.

The first lens, or approach in examining user resistance, is the system-oriented approach which suggests that resistance occurs because of technology-related factors such as the user interface, performance, security, ease of use, and degree of centralization (Markus 1983; Jiang et al. 2000). This perspective is similar to the technological perspective described by Markus and Robey (1988) and is based on the forces over which a user has little control. For example, the technology impacts the way work is done and thus this technological perspective would suggest that the technology is the cause of the

resultant behavior of employees. The problem with approaching user resistance from only this perspective is that the technology affects employees in different ways. For example, studies have found that technology may both centralize and decentralize authority (Klatzky 1970; Brown and Magill 1998), both increase and decrease the level of power (Markus 1983; Dawson and McLaughlin 1986), and fail to produce change even when expected (Robey 1981; Bjorn-Andersen, Eason and Robey 1986; Franz, Robey and Koebnitz 1986). The change that results from the technology likely affects the level and type of user resistance. However, this approach by itself is not likely to explain user resistance well.

The people-oriented approach suggests user resistance occurs because of individual or group factors such as backgrounds, traits, and attitude towards the technology (Markus 1983; Jiang et al. 2000). This is similar to the “Organizational Imperative” described by Markus and Robey (1988), which proposes that technology is put into place to meet organizational needs and thus technology is the dependent variable. This perspective implies that the IT is able to meet both the social and technical needs of the organization. People with this view see IT as a tool used to address organizational problems. Thus, if there is user resistance, it is because of people-related issues, such as the lack of skills and motivation of the employees, or organization-related issues, such as communication and job structures, not because of the technology aspects (Markus 1983; Markus and Robey 1988). This approach is helpful to identify certain types of user resistance, but this approach, by itself, also is insufficient in explaining user resistance in a complex situation such as an ES implementation.

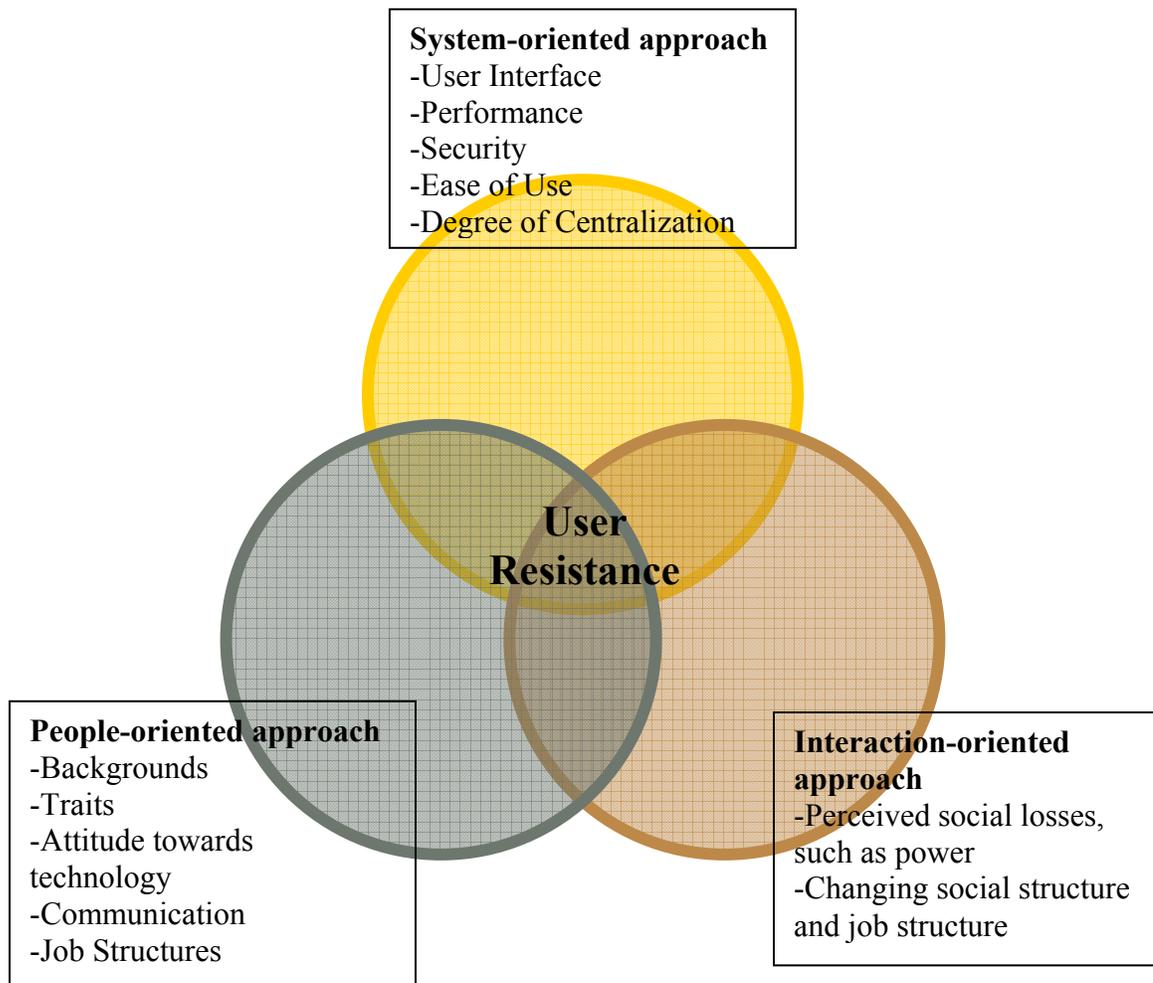
The interaction-oriented approach suggests that perceived social losses caused by interaction between people and the technology affects resistance, such as changing power relationships, social structure, and job structure (Markus 1983; Jiang et al. 2000). This is similar to the “Emergent Perspective” offered by Markus and Robey (1988). This approach suggests that there are complex interactions that affect both the uses and results of IT. Furthermore, it suggests that identical technologies can be implemented in different contexts and result in different outcomes from the employees because of the different settings. For example, Silver, Markus, and Beath (1995, p. 367), identifies how the external environment, firm strategies, organizational structure, organizational culture, business processes, IT infrastructure, information system features, and the implementation process interact to essentially affect the level of user resistance. This perspective thus does not lead to simple models, but rather because of the complexity, research using this emergent perspective usually requires a rich description of the organizational processes, technology features, and user intentions.

The interaction approach is not limited to sociotechnical and political issues, but Markus (1983) focuses on these two variants of the interaction approach. The socio-technical variant suggests that when there is a poor fit between a system and the “division of labor”, such as the system requiring different roles and responsibilities or different communication structures, people resist the system. The political variant addresses the interaction between the system and the organizational power, and thus systems that control data centrally will be resisted in organizations that have decentralized authority

structures. Moreover, people who lose power are likely to resist. The implications of this approach is that system implementers, if they believe the resistance is due to the interaction between the organizational context and the system, will try to resolve organizational problems or misfits prior to installing the system and implement strategies only after a thorough analysis of the organization. For example, in an IT study, Dawson et al. (1986) found that as an information system was implemented, foremen lost power as the assistants who work with the system gained power. Thus, the attitudes toward the system are affected depending on the relative gain or loss in power as well as the tasks that are changed in the jobs.

Figure 3 below shows a depiction of various aspects of and potential sources for user resistance. As there are different aspects, understanding the underlying reasons for user resistance necessitates the examination of three areas.

Figure 3: Aspects of User Resistance



Because of the complexity of the ES context, there are technology-determined factors, people-determined factors, and interaction-determined factors that are likely to influence users. In regards to examining the first two research questions, understanding these three approaches to user resistance helps to guide the direction in investigating why user resistance occurs in an ES implementation and how user resistance manifests itself. This study takes all three perspectives into account for the following reasons: 1) An ES implementation affects the issues addressed by all three perspectives, since it changes the

tool people use (technology-approach), affects the employees (people-approach), and upsets power relationships, social structures, and job structures (interaction-approach); 2) ES implementations have been shown to be successful in some organizations while disastrous in others. The technology, people, and the interaction between the technology and the organizational structures are an important reason for the success or failure; 3) The nature of an ES implementation is complex. A technology that is used as a tool to alter organizational structures is not just resisted because of a simple issue such as a lack of ease of use; rather, there are underlying, complex issues that may even change the paradigms of employees that need to be resolved in order to reduce user resistance. Hirschheim et al. (1988) states that the interaction of various causes of user resistance intertwine to produce a particular instance of resistance, which makes it very difficult or impossible to develop a simple causal relationship. Furthermore, Hirschheim et al. (1988) describes four sources of resisting attitudes: the individual, the system, the change strategy, and the perceived outcomes of the change. Resistance may not mean that users will resist all systems, but rather the system that is proposed is being resisted.

When considering user resistance, it is important to note that the users who resist may also be managers. LaNuez and Jermier (1994) states that managerial sabotage is increasing and that “sabotage with catastrophic potential is becoming an increasing concern” (p. 223). In an ES setting, (Sia et al. 2002) found that even management resisted empowerment as they sought to regain the power lost from the ERP implementation. Managers can be territorial and resist a system due to a number of issues such as losing power or prestige and must be taken into account in the study of

user resistance. For example, Ross et al. (2000) points out that managers felt that the computer was controlling them (changing the way they run the organization) rather than being a tool.

Reasons for User Resistance

Because of the mandatory, role-transforming nature of an ES implementation, it is likely that users resist an ES for different reasons than resisting other types of systems. It is important to understand the underlying reasons for why users resist an ES implementation. Table 3 below shows reasons for user resistance, as identified in the IT literature. All of these articles suggest different reasons for user resistance, which may be because these reasons are suggested based on different systems within different contexts.

Table 3: Reasons for User Resistance

Reason(s) for User Resistance	Methodology	Source
Job insecurity	None-Opinion Piece	De Jager (1994)
Users have values, work habits, and dilemmas that usually carries over and challenges the new system	Narrative Analysis	Alvarez and Urla (2002)
Loss of power	None-Opinion Piece	Keen (1981)
No communication channel to address fears or frustration because of some form of penalty for disagreeing with superiors	None-Opinion Piece	Marakas and Hornik (1996)
Loss of status, economic insecurity, interpersonal relationships altered, change in job content, change in decision making approach, loss of power, and uncertainty/unfamiliarity/misinformation	None-Reasons are identified, but no explanation is provided regarding their source	Hussain and Hussain (1984, p. 391)
Misalignment of the ES with the organization, or in other words, an inappropriate level of fit.	None-Conceptual Development	Gosain (2004)
Parochial self-interest (resisting due to losing something of value), Misunderstanding and lack of trust (misconceptions of implications and not understanding the benefits), Different Assessments (Employees see greater costs than benefits while management sees the reverse), Low Tolerance for Change (Employees fear the development of new skills and behaviors), and Increased Efforts (Additional abilities or efforts are required with the change).	None-This is a non-comprehensive list based on several Management and IS journals	Shang and Su (2004, p. 150)
Current habits (level of structure in existing practices) and perceived risk of adoption (performance uncertainty as well the social, economic, or physical, consequences).	None-Mentions that these two constructs seem the most useful in understanding resistance	Sheth (1981)
Interface can be confusing and difficult, Process changes	None-Identifies several articles that mention these reasons	O' Leary (2000)
Innate conservatism, lack of felt need, Uncertainty, Lack of involvement in the change, redistribution of resources, organizational invalidity, lack of management support, poor technical quality, personal characteristics of the designer, level of training and education, cognitive style of user	None-literature review of resistance to change	Hirschheim and Newman (1988)
Job security, lack of understanding, human nature	None-opinion piece	Ainsworth (1977)

It is interesting to note from this table that most of the reasons for user resistance are not related to specific system characteristics (i.e., interface); rather, many of the reasons for user resistance are due to the job changes resulting from the system (i.e., loss of power). Also, only one of these articles bases the identified reasons on part of their study. The other articles mention reasons for user resistance but did not actually identify the reasons themselves. Although user resistance has been mentioned in numerous studies, there has not been any study found that actually sought to comprehensively understand why users resist.

The previous paragraphs have classified system types and identified user resistance as an important, yet relatively unstudied concept. In order to gain more insight into this concept, organizational change literature related to resistance is examined in the following paragraphs. Far more literature has focused on the concept of resistance to change, rather than user resistance. Although the resistance to change literature can partly explain user resistance to an ES, the ES implementation is a type of change that requires users to adapt to new processes and use a standardized system to enter and retrieve information. Some of the principles addressed in this research stream are applicable to user resistance to an ES implementation. Users may partly be affected by the technology, but there are a number of issues not related to the technology characteristics that also affect user resistance. For example, Martinsons et al. (1999) found that a number of nontechnical factors are associated with smoother organizational change. Orlikowski and Barley (2001) discusses how organization and technology

studies have epistemological differences and makes the argument that there is much value in having a greater interaction between organization and technology studies. Essentially the interaction of these fields of study can lead to a better understanding of the phenomenon involved in an ES implementation. Thus, the following paragraphs bring in the literature on organizational change to shed light on how employees respond to change. Furthermore, this section identifies organizational issues that management needs to address.

Reasons for Resistance to Organizational Change

In regards to resistance, the management literature has defined resistance as “the forces against change in work organizations” (Mullins 1999, p. 824). Employees often respond to change with resistance and thus resistance to change is a well-studied area in the organizational change literature; one source describes it as the natural reaction employees have to anything that upsets the status quo (Conner 1993). The change management literature is filled with examples of employees resisting change (i.e., Mainiero and DeMichiell 1986; Knights and Vurdubakis 1994; Folger and Skarlicki 1999). However, studies have focused more on organizational factors; few studies have examined employees’ resistance to change at an individual level (Jermias 2001).

Resistance to change is important to consider; minor resistance can reduce the speed of change while major resistance can ultimately cause management to abandon its plans (Davidson 1994). Doppler (2004) notes that resistance is a normal phenomenon and that ignoring resistance can cause many future problems; alternatively, recognizing

resistance and dealing with it appropriately can reduce enduring problems. Gravenhorst and in 't Veld (2004) points out that change and resistance go hand in hand; accordingly, change suggests resistance and resistance implies change.

Although the conceptualizations of resistance identified in the previous paragraphs are useful in identifying the notion of resistance, studies that have identified reasons for why employees resist change are not as useful in understanding resistance because of the inconsistent results. It is noticeable from Table 4 that these studies, which focus on reasons for user resistance, differ on both the number of reasons as well as the actual reasons for resistance. Perhaps this is due to the differing environments and the types of changes faced by the employees. For example, in an organizational merger, it seems logical that the reasons for resistance to change would be different than the reasons for user resistance to an ES. Also, just because a reason is identified does not imply that it is the driving force for resistance even though it may contribute to resistance.

Table 4: Non-IT Studies Examining Resistance to Change Reasons

Study	Reasons for Resistance to Change
Kotter and Schlesinger (1979)	1) employees think they will lose something they value, such as a position, power, or relationships; 2) employees have a lack of trust in the person or people implementing the change or misunderstandings occur; 3) employees see a greater cost than benefit from the change; 4) employees have a low tolerance for change because of a lack of skills or because it makes them feel uneasy performing new behaviors and working with different relationships
Kegan and Lahey (2001)	psychological dynamics that occur in employees because of what is called “competing commitments” – thus employees, even though they may want to change, have hidden commitments that compete with the commitment they have toward the change.
Ford, Ford and McNamara (2002)	resistance may not be in response to a current issue; rather, there are ongoing background conversations that create a context for the level of change initiative as well as the responses to the change.
Pardo del Val and Fuentes (2003)	myopia, denial, perpetuation of ideas, implicit assumptions, communication barriers, organizational silence, direct costs of change, cannibalization costs, cross subsidy comforts, past failures, different interests among management and employees, environmental changes, resignation, inadequate strategic vision, implementation climate, departmental politics, incommensurable beliefs, deep rooted values, social issues, leadership inaction, embedded routines, collective inaction, lack of capabilities, and cynicism
Trader-Leigh (2002)	Self-interest (employee’s interests are not met), Psychological impact (i.e., job security, social impact), Tyranny of custom (organizational culture was too rigid), The Redistributive Factor (redistributing resources and changing policies), The Destabilization Effect (job role change leads to untrained/inexperienced employees), Culture Compatibility (incompatibility of change with organizational culture), and the Political Effect (constraints based on organizational politics)

The previous paragraphs have examined the reasons for resistance to change, from the management literature. Although there are a plethora of reasons, studies have not focused on the underlying reasons for user resistance in an ES implementation. Moreover, studies have not focused on how user resistance manifests itself throughout the ES implementation. The following paragraphs describe conceptualizations of user resistance behaviors.

User Resistance Behaviors

For this study, user resistance behaviors is defined as “outward manifestations of opposition to the system implementation.” Shang et al. (2004) offers one conceptualization of user resistance behaviors and organizes resistance into three types. This classification and description is based on several studies identified in their literature review. As shown in Table 5 below, the three categories are non-destructive, passively-destructive, and proactively-destructive. Depending on the circumstances surrounding an ES, any three of these behaviors may be manifested through the users, causing implementation problems. Although Kling (1980) found that users often resist rationally, it is interesting to note the spectrum of behaviors that may arise when users resist the ES.

Table 5: A Classification of Types of User Resistance

Resistance Type	Resistance Behaviors
Non-destructive	Request job transfer or withdraw from the job Increased absenteeism or tardiness Communicate negative feelings to coworkers
Passively-destructive	Refuse to cooperate with other employees Neglect work assignments Waste time and make minimal effort to improve knowledge or skills Inferior quality performance Dissonance with consultants
Proactively-destructive	Deliberately sabotage a work process Make careless mistakes

Adapted from Shang et al. (2004, p. 151)

One other IT study that classifies resistant behaviors is Lapoint and Rivard (2005), based on three cases. The behaviors are classified on the following scale: 1)

Adoption; 2) Neutrality; 3) Apathy; 4) Passive Resistance; 5) Active Resistance; and 6) Aggressive Resistance. Other than Lapoint and Rivard (2005) and Shang (2004), few IT studies have focused on the types of behaviors manifested through the user resistance. However, it is important to better understand conceptualizations of resistance and types of behaviors that may be exhibited. Thus, the following paragraphs draw from the management and psychology literature that revolves around resistance to change.

Prior to discussing the behaviors of user resistance, it is important to further characterize user resistance behaviors. It is unclear from some studies what exactly is meant by user resistance behaviors. For example, Piderit (2000) is one conceptualization of resistance to change, and suggests that the resistance literature has focused on three somewhat overlapping conceptualizations of resistance: attitude (i.e., beliefs about the object), emotion (i.e., frustration, anxiety, aggression, feelings in response to the attitude), and behavior (i.e., intentional acts of commission or omission). Although Piderit (2000) focused the behavior on intentional acts, for this study, it is irrelevant whether or not the act is intentional; rather, this study focuses on any outward manifestations of opposition to the system implementation.

Bovey and Hede (2001), a psychology paper, conceptualizes types of resistance behaviors, framing resistance on a continuum, with active resistance on one side and passive resistance on the other. Active resistance may entail expressing opposition to the system through a voicing of an opinion, or a more extreme opposition would be leaving the organization. Passive forms of resistance are much harder to detect and deal with and

may entail withdrawing from conversations, avoiding the required training, and delaying an implementation. Resistance behaviors may also exist on a continuum between overt and covert behaviors. Overt behaviors could include making a stand against the system and openly obstructing the implementation. On the other hand, covert behaviors are when employees grudgingly use a system, find ways to work around the intended purpose of a system, or sabotage the system to ensure its failure, purposefully misenter data, not use the system for its intended purposes, or complain about the system to coworkers.

Figure 4 shows one way that resistance behaviors have been classified:

Figure 4: Resisting and Supporting Behaviors

	Overt ← (openly expressed behavior)	→ Covert (concealed behavior)
Active (Originates action)	Resistance <ul style="list-style-type: none"> • Oppose • Argue • Obstruct Support <ul style="list-style-type: none"> • Initiate • Embrace 	Resistance <ul style="list-style-type: none"> • Stall • Dismantle • Undermine Support <ul style="list-style-type: none"> • Support • Cooperate
Passive (not acting, inert)	Resistance <ul style="list-style-type: none"> • Observe • Refrain • Wait Support <ul style="list-style-type: none"> • Agree • Accept 	Resistance <ul style="list-style-type: none"> • Ignore • Withdraw • Avoid Support <ul style="list-style-type: none"> • Give in • Comply

Adapted from Bovey et al. (2001a, p. 375) and Bovey et al. (2001b, p. 534)

A person who resists may exhibit one or more of these behaviors; the value of this classification lies in the identification of the potential types of behaviors.

Falbe and Yukl (1992) presents a similar concept as Bovey and Hede (2001), yet has a different terminology as it differentiates resistance from commitment and compliance. When an employee receives a request, commitment would result in agreeing and enthusiastically exercising initiative to take positive action on the request. Compliance would result when the employee is apathetic, initiates minimal effort, and does not exert initiative. Resistance would result when the employee refuses, argues, delays the response, or seeks to cancel the request. The way Falbe et al. (1992) defines compliance is similar to how Bovey et al. (2001) describes passive resistance behaviors and the way Falbe et al. (1992) describes resistance is similar to how Bovey et al. (2001) describes active resistance.

The previous paragraphs discuss reasons for user resistance and user resistance behaviors. Resistance is a complex phenomenon, and the context and type of change are likely to influence the type of resistance. The next section focuses on the third research question, which deals with the management strategies used to minimize the level of user resistance. Management strategies to minimize user resistance are also a complex issue because of the complexity of the implementation and the underlying causes of user resistance.

Management Strategies to Minimize User Resistance

As stated previously, an ES implementation necessitates change. Whether or not the employees are aware of the effects of their user resistance, from a management and system implementer's perspective, it is an issue that needs to be dealt with in a manner

that produces favorable results. Aladwani (2001) discusses the need for management to proactively deal with user resistance rather than reacting when it arises. However, this requires management to understand the nature of user resistance and take appropriate steps, such as appropriately marketing the ES to employees (Aladwani 2001). Following are the results of studies that have examined management strategies to minimizing user resistance.

General Management Strategies to Minimize Resistance

An important factor to successful implementation is minimizing users' resistance to change (Marakas and Hornik 1996; Joshi and Lauer 1998). It is important for management to have strategies in place to minimize user resistance. Without adequate strategies, it is quite possible for management to errantly search for the resisters, punish the compliers, and promote the uninvolved. The other extreme would be for management to take no action against the resisters, which would also lead to problems.

Few IT studies have examined management strategies to minimize user resistance. Jiang et al. (2000) examines management strategies and identifies twenty general strategies, although these strategies are based on resistance literature. Managers can use this list of general strategies as a checklist for various types of systems: Involve employees, Open communication, Provide change info, Initiate moral boosts, Pace conversion, Redevelop modularly, Reward ideas, Document standards, Clear authority, Upgrade environment, Pilot study, Alter job titles, Show sympathy, Orientation, Job transfers, Separation pay, Hiring freeze, Job counseling, Group therapy, and Retrain

employees. However, as with most checklists, all the items are not applicable to every environment; this is demonstrated by the conclusion of Jiang et al. (2000) that the system type affects the management strategies employed.

In the following paragraphs, the non-IT literature that discusses management strategies to minimize resistance is examined. Although there are countless potential strategies, Ross et al. (2000) discusses how firms could deal with resistance by providing stock options as incentives. Since there are numerous potential management strategies, rather than focusing on individual strategies related to organizational change, the following paragraphs identify literature that examines categories of management strategies.

There appears to be four general management approaches that encompass strategies that deal with organizational change. Hersey and Blanchard (1988 p. 340-341) points out two general strategies that management implement: participative and directive. Dunphy and Stace (1993) includes participative and directive as well as addresses two other general strategies: consultative and coercive. Participative change strategies are more of a bottom-up approach that involves groups in selecting and formalizing new methods to reach the goals. In a system implementation setting, this may include obtaining user input in the design stage (Floyd 1993), user training and testing (Hu, Clark and Ma 2003), and providing a vehicle for employees to participate in process improvement (Edosomwan 1996). Directive strategies are management-directed and include power redistribution (Legare 1995; Goltz and Hietapelto 2002), financial rewards

for learning the system (Lawler 2000), human resource involvement during the adoption process (Martinsons and Chong 1999), and eliminating jobs for users who fail to adequately learn the new system (Mainiero and DeMichiell 1986). Consultative strategies involves providing employees with support and information and only involves employees minimally in goal-setting. Coercive strategies involve forcing change on employees, often imposing a threat to non-compliers. The four styles of change leadership are described further in the table below:

Table 6: Change Leadership

Type	Styles of Change Leadership
Participative	This involves widespread participation by employees in important decisions about the organization's future, and about the means of bringing about organizational change.
Directive	This style of leadership involves the use of managerial authority and direction as the main form of decision-making about the organization's future, and about the means of bringing about organizational change.
Consultative	This style of leadership involves consultation with employees, primarily about the means of bringing about organizational change, with their possible limited involvement in goal setting relevant to their area of expertise or responsibility.
Coercive	This style of leadership involves managers/executives or outside parties forcing or imposing change on key groups in the organization.

Adapted from Dunphy et al. (1993, p. 920)

Shang and Su (2004) is an IT study which identified potential management strategies based on the four styles of leadership identified above. The table below describes a number of strategies that have been used to manage user resistance:

Table 7: Managing User Resistance

Management Style	Management Strategies
Directive (Use of managerial authority to effect change)	<ul style="list-style-type: none"> • Pace conversion to allow for reasonable readjustment period • Document standards so new procedures are easy to learn and reference • Retrain employees to be effective users of the new systems • Reward ideas that will improve throughput • Clarify job definition before the changeover • Alter job titles to reflect increased responsibility • Arrange for voluntary job transfers to avoid users with no interest in new procedures • Call a hiring freeze until all displaced personnel are reassigned • Give unions higher wage rates in return for a work rule change • Give one of its leaders, or someone it respects, a key role in the design or implementation of a change
Participative (Widespread participation by employees on direction and process of change)	<ul style="list-style-type: none"> • Involve employees in development of new systems to encourage a feeling of ownership • Provide employees with information regarding system changes to preserve ownership • Open lines of communication between employees and management • Initiate morale boosting activities: company parties and newsletters to promote community
Consultative (Provide employees with information and moral support)	<ul style="list-style-type: none"> • Provide job counseling and organize group therapy to help employees adjust • Listen and provide emotional support • Conduct orientation sessions to prepare for change • Be receptive to complaints following conversion to maintain employee contact and trust • Provide one-on-one discussions
Coercive (Forcing or imposing change on key groups)	<ul style="list-style-type: none"> • Implicitly and/or explicitly threaten loss of job and promotion possibilities • Fire or transfer people who resist change

Shang et al. (2004, p.152).

The previous paragraphs discuss general categories of management strategies for dealing with change. The next section deals with the building blocks of organizational change. Although the unit of analysis for this study is the individual, these building

blocks are helpful in understanding the process of transition, which is important in determining management strategies to minimize user resistance. As there have been studies that have examined the underlying building blocks for change theories, the following section identifies, categories, and builds upon these basic building blocks.

The Motors of Change

“Motors of change” explain why and how change unfolds and refers to the building blocks from which change theories are derived (Van de Ven and Poole 1995). This section identifies six building blocks that have been discussed in several publications. Principles are extracted from the six change processes in regards to how the type of change affects resistance and the management strategies that would be most successful in the ES context. Using these motors in examining the pattern of an ES-facilitated organizational change is valuable for four reasons: 1) they are the roots from which many change theories are based; 2) they can be used in building theory that can be used to explain the pattern of changes in an ES implementation; 3) they focus research towards certain aspects of the change that are key building blocks in explaining change; and 4) they also address multiple perspectives to change – for example, Robey and Boudreau (1999) points out that multiple interpretations are useful in identifying patterns of influence and change.

The non-IS literature that focuses on issues related to change in organizations should help to identify perspectives and issues that management and users would encounter in an ES implementation. These theoretical perspectives are brought in from

the organizational change literature to help in addressing the issue of user resistance. There are a number of articles that examine the change processes in organizations; however, two articles reduce the change processes into simple “motors of change” which explain organizational change (Ford and Ford 1994; Van de Ven and Poole 1995). Change theories in disciplines from biological science to organizational behavior often use one or a combination of these “motors” to explain the change.

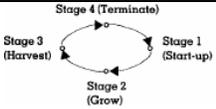
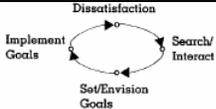
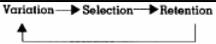
Van de Ven and Poole (1995) addresses four motors of change: teleology, dialectics, life cycle, and evolution. Ford and Ford (1994) discusses two other motors: trialectics and formal logic. For the teleological motor, there is one discrete entity that shares a common goal. This entity may accept this goal either implicitly or explicitly but the social construction process is clearly visible. Also, constraints and requirements exist in order for that entity to attain the goal. For the dialectical motor, two or more entities exist that oppose each other. These opposing entities engage in some form of conflict between them, which leads to either a new entity, the defeat of one of these entities, or a stalemate between these entities. Conflict is necessary between two opposing entities leading to some form of synthesis that results from this conflict. For the lifecycle motor, change causes an entity to progress through distinguishable stages. There is some form of logic, rule, code, or a routine that determines the stages and the progression that occurs. For the evolutionary motor, multiple entities exist and there are mechanisms that lead to some form of selection, variation, and retention of the entities or the characteristics of these entities. Ford et al. (1994) describes the trialectics motor as an entity that is attracted to one of multiple “material manifestation points”, which are places

of equilibrium until there is a stronger attraction to another “material manifestation point”. Ford et al. (1994) describes the Formal Logic motor as the examination of something that occurs, the resulting effect, and the relationship between these two occurrences.

Table 8 is a framework that draws from the work of Van de Ven et al. (1995) and Ford et al. (1994) as well as other publications that have addressed or used these motors of change in order to build upon these conceptions. The differing attributes of the six motors are pointed out and their applicability and usefulness to the ES environment is described.

Table 8: Six Basic Building Blocks in Explaining Change

	Lifecycle	Formal logic	Dialectic	Teleology	Trialectic	Evolution
Metaphor	Reoccurring Set Processes	Replacement of old ideas/entities	Conflict Between Entities	Goal-oriented cooperation (continuous improvement)	Employees attracted to best option	Best option eventually succeeds
Progression	A linear sequence exists that guides the change	Removal of old process and replacement with new	Recurring conflict between entities with eventual synthesis	Iterative process of goal setting, implementation, reassessment	Entity attracted to best option and remains until a better option exists	With multiple options, there is recurring conflict until the best option remains
Contributing Forces	Previous life cycles	New process is substituted	Opposing entities and the level of conflict	Goals and the success of the implementation	Level of attraction of options	Level of conflict
Assumptions about resistance	The type of resistance that occurred in a previous lifecycle will occur again	The old and the new cannot coexist, so resistance does not occur	All conflict is because of resistance	Those who do not support the goal are resisters	Resistance does not exist; an entity does not embrace a change because of a lack of attraction towards it	Resistance is immaterial because the best option eventually succeeds over a long time period
IT-related Example	Software Development Waterfall Model	Direct cutover to new system	Subordinates are forced to use a system	Incremental System development	Programmers attracted to most suitable programming language for the task	Multiple word processing packages in use until one option “wins”

<p>Diagram</p>	 <p>Van de Ven et al. (1995, p. 520).</p>	 <p>1. Remove A 2. Replace/Substitute with B</p> <p>Ford et al. (1994, p. 759)</p>	 <p>Van de Ven et al. (1995, p. 520).</p>	 <p>Van de Ven et al. (1995, p. 520).</p>	 <p>Ford et al. (1994, p. 765)</p>	 <p>Van de Ven et al. (1995, p. 520).</p>
<p>View on Change</p>	<p>Predictable, based on past change</p>	<p>Throws out old and replaces it with new (change through replacement)</p>	<p>Changes emerges from a synthesis of the conflict</p>	<p>Change occurs because of the goals that are set</p>	<p>Entities are attracted to change</p>	<p>Used in describing long periods of growth with no major upheavals</p>
<p>Usefulness in Identifying Resistance in an ES Implementation</p>	<p>There are some processes that are consistent across organizations in an ES implementation and to some degree resistance can be predicted</p>	<p>This motor does not focus on resistance – rather it is focused on the old being thrown out in order for the new to exist. Competing structures are destroyed prior to enacting new structures</p>	<p>This is a useful lens in which to examine the conflict between management and users in an ES implementation</p>	<p>Management definitely sets goals in an ES implementation, however, this motor does not address the conflict or resistance between the goal-setters and those who must comply</p>	<p>To some degree, if users are attracted to a change, they will be more supportive and less resistance will exist. However, a dilemma for management is <i>how</i> to make it attractive</p>	<p>This does not apply to ES change, because the system is mandated and implemented quickly rather than a longer time period where the best system is selected</p>

Ford et al. (1994) describes how motors of change affect the level of resistance in more detail than Van de Ven (1995). In regards to formal logic, opposition is viewed as two mutually exclusive entities, one of which needs to be displaced. Thus, resistance does not occur as the old and the new cannot coexist. From a dialectics standpoint, resistance occurs because of the opposition between the entities. Since two opposing groups exist, one opposition group is failing to go along with the change and thus that entity is considered to be resistant. Based on this view, the way to minimize resistance is to enact mechanisms that reduce the level of resistance. Thus, in an ES setting, that would entail management strategies that make it more painful not to comply than to comply or easing the transition through strategies such as providing more detailed explanations of the change. From a trialectics standpoint, it is assumed that resistance does not occur as there is no opposition that people need to overcome; rather, if employees do not seek after the proposed change, it is due to a failure to appropriately attract employees. Thus, an appropriate management strategy from this standpoint would be to make the proposed change more attractive to employees. If the ES implementation appears attractive to employees, they embrace the system and the organizational changes that are to occur.

Although all the motors of change may be present in an organizational change, it is likely that one or two may explain most of the resistance that occurs. The following paragraphs describe several studies that have focused on either one or multiple motors in explaining organizational change.

Soh et al. (2003) uses a dialectical perspective to explain the misalignment that occurs between an organization's structures and the structure that is embedded in the ES. Soh et al. (2003) finds that one set of forces arose from the structures embedded in an ES and another set of forces developed from the organization that had its set structures. The structures in an ES may include decision-making, reports, processes, and organizational controls. On the other hand, organizational structures include shared norms, current processes, values and expectations, all of which have developed through the organization's history. These two different structures are often at odds with each other, leading to the dialectical nature that tends to be present in an ES implementation. Soh et al. (2003) found that there is a misalignment between the ES's structures and the organization's structures in areas such as data ownership, data entry, job scope, reports, workflow changes, and revenue processing.

Greiner (1972) discusses the evolutionary and revolutionary approaches in describing the nature of change. "Historical forces [organizational age, organizational size, stages of evolution, stages of revolution, and the growth rate of industry] do indeed shape the future growth of organizations" (Greiner 1972, p. 38). Greiner (1972) refers to evolution as the periods of time that no major upheaval occurs as opposed to the revolution which is the periods of time that organizations experience considerable turmoil.

Cule and Robey (2004) develops an organization change theory based on the dialectic and teleological motors. The teleological perspective is taken into account as

this goal-oriented approach appears to be implicit to managers. The dialectical approach is taken into account as employees do not necessarily support the goals, and thus interplay exists between these opposing forces. Furthermore, Cule et al. (2004) uses both an individual (teleological) and organization (dialectical includes multiple individuals) level of analysis in order to increase explanatory power while maintaining consistency between the two levels. Cule et al. (2004) found that a teleological motor, among senior level management, essentially constructed the new organization, but that the goals were resisted as employees did not support the new goal.

The six motors are used as lenses by which to examine management strategies to minimize resistance. First of all, the ES implementation may have conflict between entities, which seems to be inherent in ES implementations. The use of the dialectics approach is used to examine the ES change and may lead to a further understanding that helps to identify the contributing forces to the struggle between management and users and the resulting synthesis that occurs. Second, the trialectics motor is useful as there are incentives used to attract users to change and thus reduce user resistance and lead to an improved understanding of management strategies. Third, the teleology motor is useful as management sets goals for the ES; this leads to a better understanding of the development of management strategies and goal setting. Fourth, the lifecycle motor is used in examining management strategies as there may be some process cycles of ES implementations that are likely to carry over from one organization to another. Fifth, the evolution motor helps to identify incremental changes that occur in the organization. Although the ES change tends to be more of a revolution to the organization, some

structures receive only gradual change through the implementation. Sixth, the formal logic motor is useful since there are structures that are discarded with the ES that may help in the understanding of management strategies.

Therefore, since motors may contribute to a better understanding of management strategies in an ES implementation, six principles derived from these motors are used in this study, and described in Table 9 below:

Table 9: Applicability of the Motors of Change

Motor	Principle	Areas to Examine
Dialectic	There is a struggle between management and users that eventually leads to some form of synthesis	The nature of the struggle as well as what leads to the synthesis of ideas
Trialectic	There are attractive attributes of a change that draw users towards the change	What attractive attributes exist in an ES implementation that can guide management's decisions
Teleology	There is some form of goal setting that occurs in the organization and potential conflict with those who are not supportive of the goals	The nature of goal setting and the resulting conflict that occurs
Lifecycle	There are repeated processes that occur from one ES to another	The nature of implementation processes and how they vary from one implementation to another
Evolution	There are evolutionary aspects of the change which may affect the management strategies	Evolutionary aspects of the change
Formal Logic	There are structures that are discarded that may affect the effectiveness of the management strategies	The removal of organizational structures

As there are no clear theories available by which to examine the research questions, this chapter has addressed the related literature and provided lenses by which to examine both user resistance and management strategies. The nature of this study is exploratory, and thus the following chapter lays out a methodology to both explore answers to the research questions, as well as validate quantitatively answers to two of the four research questions.

CHAPTER III. STUDY 1

This study is examining an area where theory is lacking. Thus, the research questions revolve around identifying issues pertinent to user resistance. The underlying reasons for user resistance, the resistant behaviors that are exhibited, and the management strategies to minimize resistance all need to be explored. In order to answer the first three research questions, a qualitative study was conducted, which allows for systematically gathering data that may not be subject to quantification. This study encompassed interviewing people who have been involved as managers, IT personnel, or users in an ES implementation. These interviews were tape-recorded, transcribed, and analyzed to understand the underlying reasons for user resistance, the user resistance behaviors, and the management strategies that affect user resistance.

Epistemology

A qualitative research method is best suited and has been used to answer the first three research questions. Qualitative research methods enable researchers to examine social and cultural issues through the use of interviews, observation, questionnaires, manuscripts, and researcher's impressions (Myers and Avison 2002). Qualitative research can be interpretive, positivist, or critical, depending on the researcher's philosophical assumptions (Myers and Avison 2002). Positivist research assumes that reality is objective and has measurable properties and generally attempts to test theory.

Interpretive research assumes that access to reality is through social constructions, such as consciousness, language, and shared meanings, and attempts to understand the context and processes. Critical research assumes that social reality is constituted historically, and attempts to perform a social critique (Myers and Avison 2002). Study 1 works within the interpretive epistemology as it seeks to understand reality through social constructions and understand the context and processes. Table 10 below further contrasts the positivist and interpretive epistemologies in relation to this study.

Table 10: Comparison of the Positivist and Interpretivist Epistemologies

	Positivist	Interpretive
Unit of Analysis	ES user	ES user in the context of the system and organization
Goal	Identify reasons for user resistance, resistant behaviors, and management strategies to minimize resistance	Understand the meanings behind the reasons for user resistance, resistant behaviors, and management strategies to minimize resistance
Coding	Test the hypothesized categories or categories identified in previous research	Use of grounded theory to derive categories not identified previously
Viewpoint on the transcripts	The meaning is static and can be derived from the text	The meaning is based on contextual issues and can only be understood by understanding the context

For interpretive research, an important feature, stemming from the anthropological tradition, is the “thick description”, due to the intertwined and complex conceptual structures (Walsham 2002). This detailed description is necessary to understand the complex interactions among employees that ultimately affect outcomes. For the use of theory in interpretive case studies, there are three major uses: “as an initial

guide to design and data collection; as part of an iterative process of data collection and analysis; and as a final product of the research” (Walsham 2002, p. 104).

Methodology

There were three steps taken in data collection. The first was the use of an expert panel. The second step was an in-depth case study of an implementation at a large university. The third step, which was used to validate the findings, was interviews with multiple employees in an Asian airline and a cellular company. For all of these steps, the level of analysis was the individual.

Step 1: Expert Panel

The goal of the first step is to understand the major issues related to user resistance that arises in an ES implementation. The interview script is shown in Appendix E and was developed with general questions revolving around the first three research questions. The discussion with the expert panel was semi-structured as many follow up questions were added to further probe into the comments made by participants. There were two parts to this expert panel: a focus group with seven IT professionals that have been involved with Enterprise Systems and an interview with an expert that has led the rollout of several ESs as a CIO or a Fortune 500 firm. The focus group ranged from heavy involvement in an implementation to occasional usage. This focus group was used to extract perspectives on the reasons for resistance, the resistant behaviors and the management strategies to minimize resistance. The session lasted over an hour and all conversation was recorded and transcribed. Most of the members of the focus group told

multiple stories about the types of resistance they saw during the ES rollout, their perceived reasons for the resistance, the resistant behaviors, and the strategies management used to minimize the resistance. The separate interview with the individual expert followed a similar format to the focus group. This interview lasted approximately one hour and also was recorded and transcribed.

The transcripts from the interviews of both the focus group and the individual expert were analyzed to extract the major principles and concepts. All comments related to reasons for resistance, resistant behaviors, and management strategies to minimize user resistance were highlighted and then analyzed. Upon completion of analysis of the data collected in the case study (described in step 2 below), a further analysis of these transcripts was performed in order to integrate comments from the expert panel with the in-depth case study.

No claim is made regarding the representativeness of these experts; however, their level of involvement with the rollout of an ES was useful in developing an initial understanding of the user resistance. The sample quotes in Appendices A, B, and C that are labeled “F1” are from members of the focus group and provide information on user resistance that was experienced by the IT personnel that comprised the focus group. The purpose of this first step was to gain an initial understanding of user resistance in an ES implementation and to highlight some of the key issues, not to make any claim about the representativeness of their comments. The inert bias in the fact that all experts were IT

professionals was taken into account and thus both step 2 and step 3 focused on users from various backgrounds rather than focusing on IT professionals.

Step 2: In-depth Case Study

The second step was an in-depth case study. If no a priori theory is posited, a grounded theoretical approach can be used with case studies (Eisenhardt 1989). Case methodology is useful when a natural setting is required and in particular, a rich natural setting may be useful for generating theories (Benbasat, Goldstein and Mead 2002). Most case studies are exploratory as they seek to explore and describe a phenomenon (Benbasat et al. 2002). Some case studies describe the events and then present one or multiple theories to explain events (Markus 1983; Franz and Robey 1984; Kling and Iacono 1984) while other case studies test theories (Keen 1981; White 1984; Bonoma 1985).

Eisenhardt (1989) suggests that case study research may produce concepts, propositions, or a conceptual framework. The results of this study can be generalized through these outputs, which are similar to “grounded theory” (Glaser and Strauss 1967). Strauss (1990) points out that grounded theory builds theory yet does not begin with theory; rather, it focuses on an area of study that is relevant. The area of study, or related literature, stimulates sensitivity to theory through the identification of relationships and concepts. Moreover, the literature is useful because of the descriptions provided of reality. Strauss (1990) differentiates theory and description by pointing out that theory uses concepts, which are interpretations on data, and relationships between the concepts.

Description does not include forming data into a conceptual theme and even though it may include organizing data into themes or concepts, it tends to have summaries of the data rather than interpretations. There are four purposes for the procedures of grounded theory: 1) build theory; 2) incorporate the necessary rigor into the process to enable the theory to be “good” science; 3) help the analyst break biases and assumptions; and 4) provide grounding needed to develop an explanatory theory that closely represents reality (Strauss 1990, p. 57)

For this case study, a large public university was selected that is located in the southeastern United States. This location was ideal for several reasons: 1) The rollout of the ES was a major change, affecting many employees; 2) This university faced resistance in many departments; and 3) Because the university is a state institution with stable employment, employees would likely be more forthright with their resistance experiences. With approximately 40,000 students, and close to 10,000 employees, The selected system contained nine modules: Purchasing/Procure to Pay/Order to Cash, Grants, Accounts Payable, Asset Management, Accounts Receivable/Billing, Budgets, General Ledger, Project Costing, and Record to Report. Users of the system were sought out to be interviewees for this case study. Employees were selected based on three criteria: 1) represent different departments; 2) represent different positions; 3) they use (or used) the system regularly. There were 22 people interviewed from all levels of the organization: 5 clerical staff, 2 IT professionals, 3 trainers, 2 top management, 4 middle management, 4 office managers, 1 accountant, and 1 purchaser. Seven of these users were superusers, which is an employee that undertakes an either part- or full-time role

with the ES implementation that requires a greater degree of commitment to the project. This employee tends to be more knowledgeable and skilled with the system and business processes and often is the first person a group of people go to for support.

This study used semi-structured interviews for the primary data collection. These interviews obtain the interpretations of the interviewees in regard to the processes and events of system implementation, reflecting an external reality (Kirk and Miller 1986; Cooper 2000). Although some questions are directly related to the interviewees' response to the system, questions were also asked that required the interviewees' interpretation of events. For example, the interviewees' interpretation of the reasons for user resistance and resistant behaviors of others was sought out along with the interviewees' own reasons for user resistance and resistant behaviors. Because these users experienced the implementation of the system and know and talk with other users who experienced the implementation, the experiences of the interviewee and the interviewee's interpretation of others was sought.

The literature review served as the basis for developing the primary questions noted in the interview guide (Appendix E). The data collection at this organization continued until a point of theoretical saturation; in other words, the value of an additional interview was considered negligible (Eisenhardt 1989). The interview length ranged from 25 to 77 minutes, averaging 47 minutes. The interviews were recorded and transcribed in order to acquire all of the interviewee's comments, yielding 242 pages of single-spaced transcripts (135,200 words).

Although one interviewee who worked in the legal department of an organization appeared suspicious and cautious of what was said, the rest of the interviewees appeared candid in their responses and did not mind being recorded. When questions were asked during the interviews, the researcher tried to listen well while conveying a non-judgmental attitude. Walsham (2002) was taken into account as it warns that data may lose its richness if the interviewing style of the interviewer is over-directing the interview through tight controls. On the other hand, if the interviewing style is excessively passive, the interviewees may conclude that the researcher is not interested in their views or have no views of their own, which may lead to the doubting of the professional competence of the researcher (Walsham 2002).

Techniques were used from grounded theory (Glaser and Strauss 1967) in an attempt to derive basic concepts and structures among the concepts. Each interview transcript was analyzed in depth. All the sentences from the transcripts were first marked whether or not they had any direct relevance to the areas under investigation (there were a number of paragraphs that provided extra information such as backgrounds on the individual or system, but did not relate directly to any of the research questions). Next, all statements related to reasons for user resistance, resistance behaviors, and management strategies to minimize resistance were extracted for further analysis. These extracted statements included statements from the expert panel as well as the interviewees. Each of these extracted statements (and context, if useful in understanding the sentence) was put into one of three separate documents - either reasons for resistance,

resistant behaviors, or management strategies to minimize resistance. These three documents were then analyzed to identify themes.

As the researcher progressed through the transcripts, there was a need to refine the emerging themes. Strauss (1990) recommends several steps in coding – the phenomena under investigation needs to be labeled, categories need to be discovered, categories need to be named, and the categories need to be developed based on their dimensions and properties. Multiple themes were identified in the areas of reasons for user resistance, resistant behaviors, and management strategies to minimize user resistance. After the initial identification of themes, there were multiple iterative rounds of analyzing the themes that emerged and reclassifying statements according to what emerging themes improved the classification. This essentially followed the hermeneutic process laid out by Klein and Myers (1999) which suggests an iterative process of reflecting on the interdependent meanings of the parts (individual statements) and the whole (evolving themes or conceptual framework).

For the reasons for resistance, Table 11 below identifies the four rounds in the iterative process to uncover the underlying reasons for resistance. In round 1, which is the first time the statements were read, 26 themes emerged. After rereading all the statements related to each theme, the statements were either kept in the same group, merged with another group with similar undertones, or renamed to better describe the theme that emerged.

Table 11: Identification of Reasons for Resistance

Round	Themes	Reasons for Resistance
1	26	Lose Freedom/become more accountable; Culture/Environment; Computer Self-Efficacy & Computer Skills; Lose Expertise; Communication; Job Change; Mgmt vs. End-User or Dept.; New skills/Lack of skills; Uncertainty; Lack of Incentives; Changed terminology/structure; Lack of Fit; Process Problem/Change; Complexity; Workload (extra work, more work to get same info, extra time); Tech issue; Shadow System; Training; Lack of Input; Lack of Knowledge; Lack of perceived value; Stressful; Loss of power; Learning style; Users who don't use it much; Comfort.
2	14	Communication; Complexity; Computer Self-Efficacy; Culture/Environment/Mgmt. vs. end-user; Lack of Input; Lose Expertise/Power; Lose Freedom/Become more accountable; New Skills/Skillset/Lack of skills/New way of thinking; Psychological Contract Change; Process Problem/Change; Tech Issue; Training; Uncertainty; Workload
3	13	Additional Workload; Uncertainty; Lack of Input; Loss of Autonomy; Loss of Expertise/Power; Facilitating Environment; Changed Expectations; Process Change Problem; New Skillset; Technical Problems; Complexity; Poor Communication; Poor Training
4	12	Uncertainty; Input; Control/Power; Self-Efficacy; Technical Problems; Complexity; Facilitating Environment; Communication; Training; Job/Job Skills Change; Workload; Lack of Fit;

The resistant behaviors also went through an iterative process. However, since the second round produced distinctly different behaviors, the choice was made to classify the behaviors according to types of behavior rather than themes of behaviors. The classification of resistant behaviors, shown in Table 12 round 3, is based on a classification of behaviors proposed by Bovey et al. (2001a, p. 375) and Bovey et al. (2001b, p. 534). These studies classify behaviors based on an overt-covert continuum and an active-passive continuum.

Table 12: Identification of Resistant Behaviors

Round	Themes	Resistant Behaviors
1	21	Animosity; Upset/Cry; Quitting Job/Turnover Intention/Job Change; Refusal/avoided when possible; Result of non-thorough training; Trying to use old system; Procrastinate; Not paying attention; Negative Attitude; Morale; Less Productive; Less Motivation; Hack to try to get system to do something; Impatience; Use Shadow System; Enter in Info just to get something done; Do Something their way; Didn't want to learn; Did not follow process then blame system; Complaints; Challenged.
2	19	Refusal to use system; Challenge system/plan; Hack at system; Don't follow process; Quit job/job change; Use shadow system; Try to use old system; Avoid system use; Enter in info inappropriately; Complaints; Lower morale; Defensive; Turnover Intention; Not Motivated; Less Productive; Impatient; Not paying attention; Procrastinate; Don't want to learn
3	4	Overt-Active; Overt-Passive; Covert-Active; Covert-Passive

Last of all, Table 13 below shows the four rounds of iterative theme development among statements leading to the eight distinct management strategies identified in round 4.

Table 13: Identification of Management Strategies to Minimize Resistance

Round	Themes	Management Strategies
1	47	Process Change Meetings; Interface with Existing Systems; Training; Communication; Listen to Feedback; Vanilla; Process Change; Change in Management Strategy; Upper Management not understanding lower stuff; Shadow System; Visit other locations; ES selection process; Timeframe; Volunteers; Incentive; Selection; Alternatives; Full time rollout people; Mgmt Inconsistency; Two sided view; Centralizing; SDL (solution design lab); Backfill Jobs; More Resources; Focus on Business Processes; Planning; Clear Vision; Help/Support; Empathy; Gain Support; Documentation; Pay Structure; Plan; Upgrades; Involvement; Structure; Superusers' Plan; Standardize; Capture Non-compliers; Initial Session; Individual Stepping Up; International Issue; Lack of Enforcement; Questionnaire; Consultants; Reassign People; Managers don't use system
2	21	After the Rollout; Change in Management Strategy; Communication; Customizations; Documentation; ES Selection Process; Help/Support; Implementation Team; Incentive; Lack of Enforcement; Listen to Feedback; Mgmt Consistency/Inconsistency; Non-Management Strategies; Non-resistance related; Planning; SDL (solution design lab); Superusers plan; Training; Upgrades; Upper Management not understanding; Visit other location.
3	11	After the Rollout; Communication; Customizations vs. Reengineering; ES Selection; Help and Support; Implementation Team Structure; Incentive; Listen to Feedback; Non-Resistance Related; Training; Upper Management not understanding.
4	8	Top-down communication; Listen to Feedback; Provide Help/Support; Training; Incentives; Clear Consistent Plan; Management Expertise; System Customizations

Sample quotes are provided in Appendix A regarding the reasons for resistance, Appendix B for resistant behaviors, and Appendix C for management strategies to minimize resistance. Employees within the same organization judge management strategies very differently and it is interesting to note the existence of multiple realities within the quotes. For example, within the same organization some employees think the top-down communication is excellent while others find fault with it.

As this research is exploratory in understanding the reasons for resistance, the behaviors that are manifested, and the management strategies to minimize resistance, an a priori list was not available. Thus, the themes that emerged through the iterative process of analyzing the data and restructuring the themes each were assigned a code. The coding is described in the Reliability/Validity section.

Step 3: Semi-structured Interviews in Two Organizations

The third step was the use of semi-structured interviews with employees heavily involved in ES implementations at two organizations to validate the findings of the first two steps. The use of multiple organizations is useful in order to make more controlled observations and controlled deductions and increase the level of generalizability. Although case studies tend to collect data through multiple means (Benbasat et al. 2002), the use of multiple interviews in multiple organizations can be useful when the focus of the research is on theory building, description, or theory testing. In a case study, building theory is an iterative process as a researcher may compare cases, redefine the research question, then add another case (Eisenhardt 1989). For this research, multiple interviews were conducted at multiple organizations to better understand the nature of ES implementations and the coinciding user resistance.

For this third step, multiple interviews were conducted at two organizations: One organization is an airline located in Asia and the second organization is a cellular phone company located in the U.S. Although the second step encompassed users from all levels

of the organization, this third step only included people heavily involved in the rollout of an ES. Because of their widespread experiences, these interviewees were useful in validating the findings based on the first two steps. Phone interviews were conducted with 7 employees from the airline company and with 4 employees from the cellular phone company. Although these employees represent a number of different areas within each organization, all of them were heavily involved with the implementation of the system. The roles of these employees were Accounting Operations Manager, Project Manager, Finance Manager, IT director, HR System Manager, Purchasing System Manager, Financial Systems Manager, Recruitment Manager, IT for Corporate Accounting, Accounts Receivable Manager, and Procurement Manager. All of these interviews were recorded, lasting an average of 40 minutes, ranging from 25 to 51 minutes. The recordings were all transcribed, yielding 106 single-spaced pages (47872 words).

Two research assistants coded these transcripts as well. They were instructed to use the same coding scheme developed from the first two steps of this study, shown in Appendix D. Also, they were instructed to identify any other reason for user resistance, user resistance behavior or management strategy to minimize the resistance that was not on the coding scheme. This is discussed further in the reliability/validity section. Examples of the raters' coding is provided in Appendix G. This Appendix provides examples of coding that was consistent among the raters as well as coding that was inconsistent.

Reliability/Validity

A study cannot be valid without first being reliable. First of all, reliability is shown through the suitable use of and adherence to the case study protocol (Yin 2003). The interviews were semi-structured with the general categories of questions shown below and a more detailed interview script shown in Appendix E:

- 1) What is your level of involvement in the project?
- 2) What resistance or opposition to the system did you observe?
- 3) Why do you think this resistance occurred?
- 4) What management strategies that you observed were useful in minimizing resistance?

Follow up questions were asked from the interview script in order to further probe into the underlying issues.

Reliability is also shown through the coding. For step 2, after the categories were discovered and named, the codes/themes were checked for reliability and definitional clarity (Miles and Huberman 1994). Two graduate research assistants, taking part only in the coding and unfamiliar with the research, were used to read and code the transcripts from which the researcher had derived the categories. Both research assistants were provided with a one-page coding scheme that identified each code/theme and its operational definition. Each paragraph in the transcripts could be assigned zero, one, or multiple codes. The research assistants first examined one interview transcript, discussed discrepancies, and then continued to code a sample of the remaining transcripts. The Cohen's Kappa statistic was used to analyze the level of correspondence between the

coders, which is a measure of the strength of agreement between coders adjusted for chance agreement. Cohen’s Kappa for this coding was 88.7%, well above the 61% level that is suggested to have “substantial strength of agreement” (Landis and Koch 1977, p. 165).

The coders used the coding scheme developed from the first two steps to code the interviews conducted during step 3. The coding of the 11 interviews resulted in a Cohen’s Kappa of 83.1%. This adds support for the reliability of the constructs since the Cohen’s Kappa statistic for the coding of this third step also was well above the 61% threshold. The actual coding values for the individual transcripts are identified in Table 14 below. Interviewee7 had the least amount of experience with the implementation and thus did not contribute as much information. The coders were in complete agreement with all of Interviewee7’s statements related to user resistance, resistant behaviors, and management strategies.

Table 14: Cohen’s Kappa for Coding of Step 3 Interviews

Organization	Interviewee	Cohen’s Kappa
Airline Company	1	0.806
	2	0.750
	3	0.785
	4	0.828
	5	0.803
	6	0.890
	7	1.000
Cellular Company	1	0.769
	2	0.825
	3	0.843
	4	0.841

Also for step 3, besides coding, the coders were also asked to identify any concepts/constructs they saw in the interview transcripts that were not in the coding scheme. There were two concepts/constructs that were marked as not in the coding scheme, both of which were identified as potential reasons for resistance. One was the aggressive time frame of the implementation and the other was a lack of trust in the system. While both of these are not included in the coding scheme, it was decided not to include them because the context of these two issues suggested that they both tie into reasons for resistance already on the coding scheme. For the first issue, the aggressive time frame, either the workload increases because of the quick implementation, or additional problems are created such as technical problems and lack of fit problems. Since these issues were already addressed, it was decided not to include aggressive timeframe as a reason for user resistance. For the second issue, the lack of trust in the system was only mentioned in one transcript; the context implied that the underlying reason was either a lack of self-efficacy or uncertainty, or both. Thus, no new constructs were added to the coding scheme. This lack of identification of new constructs by the coders adds support for the validity of the constructs originally identified from steps 1 and 2.

For all three steps, external validity was an important consideration as it essentially is the generalizability of the study's findings (Yin 2003). External validity was established in several ways: 1) through the use of an expert panel which is comprised of experts who have been involved with ESs within various industries; 2) detailed examination of user resistance through interviews with employees from organizations

representing three different industries; and 3) following the theoretical sampling techniques suggested by Glaser and Strauss (1967), the research sites have been chosen because of the similar yet varied conditions. All the organizations were involved with ES implementations, but are from different industries. The ESs were not identical, since the software packages were from different vendors as well as the organizations installing different modules; however, the ES implementations were mandatory in all cases and they changed the workflow processes and altered jobs.

For step 2, triangulation of the data also contributed to validity. It has been suggested that “every organizational situation is likely to be filled with multiple and frequently conflicting interpretations and meanings” (Prasad 1993, p. 1404). Thus, in a case study, it is important to establish construct validity. Construct validity is supported through the use of multiple sources and multiple data collection methods (Benbasat, Goldstein and Mead 1987; Benbasat et al. 2002; Yin 2003). In regards to the multiple sources, statements made from one interviewee were compared and contrasted with statements made with other interviewees in order to triangulate the ideas suggested by the interviewees. Multiple data collection methods were also used, since the interviewer was given access to training manuals, emails, memos, and other written documentation concerning the project. There was also an overview of the system provided for the researcher, which provided a better understanding of the process through which users traverse. Besides the diverse and differing opinions among the users, there were no discrepancies found among the various data sources.

Results

Based on the iterative construct formation process described in the previous chapter, there were reasons for user resistance, resistant behaviors, and management strategies to minimize resistance that emerged. Tables 15, 16, and 17 identify the emergent constructs. As noted in these tables, the constructs have also been placed into categories, such as Table 15 categorizing the constructs into individual, system, organizational, and process issues. The use of categories was added to provide a better understanding of the types of reasons, behaviors, and management strategies.

In order to address research question one, “What are the underlying reasons for why users resist an ES implementation?”, Table 15 below addresses the reasons for resistance. There were four constructs that best fit under the category of “Individual Issue”: Uncertainty, Input, Control/Power, and Self-Efficacy. These constructs best fit under this category because they all are individual psychological constructs that are intrinsic. Each employee has a level of desire towards these constructs. For example, one employee may be satisfied with uncertainty as long as his job is not on the line while another employee is satisfied only if the daily tasks are predictable. There is a greater chance that employees not satisfied with these “Individual Issues” will cause an unfavorable outcome to the organization.

The constructs Technical Problems and Complexity were both put into the category of “System Issue” because they were primarily related to system usage. In an

organizational change that is not technology-enabled, these constructs would not be contributing factors. However, the implementation of a large system requiring usage often leads to users experiencing technical difficulties due to bugs or the complexity of the system.

The constructs Facilitating Environment, Communication, and Training were all put into the category of “Organizational Issue” since they revolve around organizational aspects necessary to meet the needs of users. Whether or not an organizational change requires technology, employees’ attitudes are affected by these constructs because they revolve around organizational issues. For example, one organization may embrace new technologies in spite of poor communication while another organization has always been relatively stable, and not conducive to embracing new technologies, although communication may flow well between employees.

Finally, the constructs Job/Job Skills Change, Workload, and Lack of Fit were placed into the category “Process Issue” because they all are problems faced by users resulting from the changed processes synonymous with ES implementations. Technology-enabled change requires new processes that change the jobs of employees and often requires new skills. New processes usually demand a greater workload in the short-term and sometimes for the long-term. Furthermore, problems may arise because the new processes do not fit well within the organizational structure.

Table 15: Reasons for User Resistance

	Construct	Definition	Examples
Individual Issue	Uncertainty	User is unclear of the future	Unknown future, potential threat, lack of clarity
	Input	User's opinions are not considered	The thoughts and opinions of users were not sought out
	Control/Power	User loses control or loss of recognition as the expert	Leveled playing field, not the expert anymore
	Self-Efficacy	Perceived lack of capability	Lack of confidence, lack of computer skills/abilities
System Issue	Technical Problems	Problems with the system	Bugs in system, features that don't work right
	Complexity	System is complicated to use	Difficult to access, Poor user interface that lacks logic or is not intuitive
Organizational Issue	Facilitating Environment	Organizational culture is not conducive to the change	Lack of technology usage in organization, bureaucracy that is slow to change
	Communication	Communication to users is problematic	Lack of communication, users not hearing benefits of system, lack of coordination, users not understanding why
	Training	Training does not meet organizational needs	Lack of training, training seems to be a waste of time, incompetent trainers, timing of training, sufficiency of training
Process Issue	Job/Job Skills Change	User's job or job skill requirements changes	Revised job description, different job tasks, new skills, new way of thinking
	Workload	User is required to put forth additional effort	Extra work, more work to get same info, extra time
	Lack of Fit	Process problem between the system and organizational structure	Problematic changes to processes, new processes not working as planned

To address research question two, “Through what behaviors does user resistance manifest itself in an ES implementation?”, Table 16 shown below addresses the user resistant behaviors that were found. The resistant behaviors that were described by employees involved with ESs were classified by the scheme laid out by Bovey et al.

(2001a, p. 375) and Bovey et al. (2001b, p. 534). These articles classified resistant and supportive behaviors based on whether they were overt (clearly expressed) or covert (minimally expressed) and on whether they were active (person takes action) or passive (person is inert). Although there are likely other behaviors that may be exhibited by users, these behaviors are the ones that were mentioned during the interviews. The 2 x 2 matrix has been used to classify the types of behaviors that were mentioned.

Table 16: User Resistance Behaviors

	Overt ← (clearly expressed)	→ Covert (minimally expressed)
Active (takes action) ↑	<ul style="list-style-type: none"> • Refusal to use system • Challenge system/plan • Hack at system • Don't follow process • Quit job/job change 	<ul style="list-style-type: none"> • Use shadow system • Try to use old system • Avoid system use • Enter in info inappropriately
↓ Passive (inert)	<ul style="list-style-type: none"> • Complaints • Lower morale • Defensive • Turnover Intention 	<ul style="list-style-type: none"> • Not Motivated • Less Productive • Impatient • Not paying attention • Procrastinate • Don't want to learn

To address research question three, “In the ES context, what management strategies are effective in minimizing user resistance?”, Table 17 shown below categorizes and describes the management strategies to minimize resistance that were identified in the interviews. A discussion on how each of these strategies is effective in minimizing user resistance is provided in Chapter V.

Table 17: Management Strategies to Minimize Resistance

	Construct	Definition	Examples
Effective Communication	Top-down communication	Top management/implementation team communicating to users	Communicating the types of changes to occur, the benefits of the system, the goals and vision, the “whys”, managers sharing information with subordinates
	Listen to Feedback	Management listening and responding to the input of users	Distribute/collect questionnaires, address complaints
Effective Education/Support	Provide Help/Support	Management offering assistance to users	Availability of consultants or helpline, providing a support system to interface with the system
	Training	Train the users at an appropriate time in a way that is suitable for their needs	Trainers with knowledge/communication skills, address the needs of trainees, appropriate time frame
	Incentives	Suitable motivators for users to learn and use the system	Incentives to take training and to do extra work
Effective Direction/Planning	Clear Consistent Plan	Straightforward consistent strategies	Clear direction, consistent management strategies, following through with plans opposite: confusion, failure to carry out plans
	Management Expertise	Management understanding of processes and system	Decision makers understand system and processes, Decision Makers understand the details
	System Customizations	Customize the system to the processes in place	Tailor the system to fit the users’ preferences/needs

There are three categories that were identified, as shown in Table 17 above. The first category is “Effective Communication”. This consists of communication from either top management or the ES implementation team to the users, which is the Top-down Communication strategy. It also consists of communication from the users to either top management or to the ES implementation team, which is the Listen to Feedback strategy. The second category is “Effective Education/Support” and includes strategies that management can set in place to educate and support the user. This is done through the

Provide Help/Support strategy, which involves assisting the user, the Training strategy, which involves training the user effectively, and the Incentives strategy, which involves supporting the user with suitable motivators.

Table 17 essentially demonstrates the implications of this study since management strategies are identified that have emerged from the qualitative data as useful in minimizing resistance. Thus, the three categories of strategies that managers should strive for are to effectively communicate, effectively provide education and support, and effectively provide plans and direction.

Types of Users

The results of Study 1 are also useful in setting the groundwork for Study 2, which deals with research question 4 and revolves around types of users. Since the first part of this research question deals with the existence of groups, Table 18 below offers a few quotes out of the many comments made by users that demonstrates the existence of different types of users. Comments are made on each of these quotes regarding how the quotes suggest that there are different types of users.

Table 18: Quotes regarding different types of users

Quotes	Comments on Quotes
<p>U3- Using the old system, having it for 20 years - they were experts in their field - all of the sudden, you have leveled the playing field. And the new person coming off the street knows just as much about the system as you do, so you are no longer an expert... Its 18 months later - I don't have reports that I used to have.</p>	<p>The interviewee points out that for some, the loss of control/expertise is the issue, but for others, it is not having what is needed</p>
<p>U2- they weren't able to access their budgets for six months...it can be very frustrating for people, especially when they are not computer savvy or have some sense that it is not really you, it's the system... [the system changes my job since it's a] different way and it means that I have to spend more time helping people... I had to be available to answer questions. I had to be available to help people solve their problems with the system.</p>	<p>The interviewee points out that some people were not able to access budgets, others were not computer savvy, and personally, the process change was the driving issue</p>
<p>U7- I witnessed some people getting just exasperated because the people who were training them were not that knowledgeable in the subject matter and uh, you know it's hard to say whose fault that is... It became much more time consuming [Interviewer: Would you say approximately about double the time?] Yes, I would say. Of course part of it had to do with our inexperience with the system... we were reading the paper at the time about the takeover. And that didn't help morale either. They thought the software vendor has a terrible program, but they're going to be around for a while. And wait a minute I read in the paper this morning that there may be this hostile takeover. That wasn't good either.</p>	<p>Some people had poor training, while the interviewee experienced a more time-consuming job and faced uncertainty</p>
<p>U10- [the system] increased my workload in the sense in that I don't sit and wait for the departmental ledgers to get to me so I can look at them. I can go in and run them myself or go in and look at them myself or I can run reports that are more specific to what I want, which before we always had to ask somebody else to run the reports for us... I'm not intimidated by computers or systems or things like that because I know that nothing I can do on this side is going to hurt anything that's in that system... I think some of it is intimidation with this system that they're, they now have to go in and do a lot of things that they never had to do before and they're they just don't feel comfortable with it and they don't feel comfortable going beyond they're comfort zone.</p>	<p>For the interviewee who is not intimidated by computers, it is the increased workload and process changes that matter. The interviewee points out that others are intimidated by the system and are not comfortable</p>
<p>U9- the training just gets less and less... new employees or employees who didn't have these roles before, but are taking them over, there's just far too little training U9- it takes much longer to get invoices paid. To me, I mean,</p>	<p>The interviewee points out that some people face a lack of training while the interviewee</p>

honestly, I can't think of any benefits [of the system].	faces a lack of communication of the benefits
--	---

Based on the examples provided above, it appears that there are different types of users. Study 2, which is outlined in the next chapter, strives to identify and understand these groups. Although evidence is suggested from Study 1 regarding the existence of multiple groups, Study 2 does not include any hypotheses since Research Question 4 is exploratory.

CHAPTER IV. STUDY 2

In order to answer the fourth research question (What types of users exist in an ES implementation?), a second study was conducted based on the findings of the first study. Study 2 revolves around types of users that have common characteristics and resistance patterns. The goal of this study is to further understand user resistance through seeking to answer the fourth research question. In accomplishing this goal, types of users are identified, the characteristics of resistant groups are identified, and management strategies that are effective in minimizing the resistance of these groups are identified.

Methodology

Study 2 encompasses the development of a primarily quantitative questionnaire, a pilot test of the questionnaire, and a collection of a full data set of the questionnaire. The questionnaire sample is ES users. To best answer the fourth research question, Q-methodology is used. Q-methodology encompasses the use of the Q-sort, which can be useful for understanding pockets of resistance as well as user perceptions of training issues and management strategies in order to mitigate resistance. For example, Brown (2004) notes that Q-methodology can complement a project manager's set of methodologies for understanding the perceptions of stakeholders. Furthermore, Thomas and Watson (2002) points out that Q-sort is particularly suited for either exploring or validating both positivist and interpretivist conceptions within IS research. For this

study, Q-methodology is used within the interpretive epistemology to explore groups of users.

Overview of Q-Methodology

In Q-methodology, the goal is to uncover patterns of thought, not discover what percentages of people think certain ways (Valenta and Wigger 1997). The variables are the respondents, not the Q-statements (McKeown and Thomas 1988). Q-methodology deals with states of minds, which is why some publications have compared it to quantum theory that is concerned with states of matter (Brown 1986). The purpose of Q-methodology is to understand individuals and groups, not to generalize to populations, although to some extent generalization is possible (Thomas and Watson 2002). Brown (1993) points out that just as significant research can be conducted through a single case study, the focus of Q-methodology is on the quality, not the quantity of the data. The researcher studies the individual to examine if responses revolve around one or multiple themes. The statistical analysis of the scale scores does not necessarily lead to predictability, but rather to an understanding of the nature of the factors that emerge and underlying thought patterns (Brown 1980; Brown 1986).

Q-methodology was initially proposed by Stephenson (1935) and further developed in Stephenson (1953). The Q-methodology requires the development of a *concourse*, which is a representative sample of statements about a domain of interest. The *concourse* is not limited to words, but may also include photographs, collections of paintings and musical selections (Brown 1993). A *concourse* is typically derived through

interviewing people and recording what they say or pulling out clips from essays or newspapers (Brown 1993). Respondents operate on the concourse by means of a Q-sort, which is a sorting of all the items, based on the criteria specified by the researcher. Q-methodology is distinct from R-methodology; R-methodology studies the relationship among variables (Steelman and Maguire 1999), using a technique to correlate variables such as regression or structural equation modeling.

One of the differences between R-methodology and Q-methodology is that samples in R-methodology are based on a set of persons in a population; in Q-methodology, samples are based on statements drawn from a population. This is described in Stephenson (1935, p. 297), which states that R-methodology refers to “a selected population of n individuals each of whom has been measured in m tests” while Q-methodology refers to “a population of n different tests (or essays, pictures, traits or other measurable material), each of which is measured or scaled by m individuals.” Steelman and Maguire (1999) also addresses this, pointing out that while R-methodology is focused on patterns across variables, Q-methodology is focused on patterns of respondents’ perspectives. Brown (1980) points out that the letter Q is used to represent person correlations, as opposed to trait correlations used in R-methodology. In other words, R-methodology deals with the correlation and factoring of traits while Q-methodology revolves around the correlation and factoring of people. Because of this difference, Brown (1993) points out that Q-methodology interprets the factors by examining the factor scores rather than the factor loadings (which is done in R-methodology). A factor score is “the score for a statement as a kind of average of the

scores given that statement by all of the Q-sorts associated with the factor” (Brown 1993, p. 177).

A second difference is that Q-methodology revolves around subjectivity. This concept was proposed by Stephenson (1935), and focuses on respondents measuring rather than being measured. Subjectivity is “a person’s communication of his or her point of view” (McKeown and Thomas 1988, p. 12), is always anchored in self-reference, and is a key foundation of the Q-methodology (Brown 1993). An objective methodology measures a person based on tests while a subjective methodology requires the person to actively measure the tests. In other words, while an objective methodology strives to measure certain dimensions, a subjective methodology strives to understand the relative values of the dimensions. Q-methodology “combines the strengths of both qualitative and quantitative methods” (Brown 1996, p. 561) as it provides insight into the philosophic structures of subjective phenomena, measures patterns within individuals, permits the structuring of hypotheses, and is a comprehensive approach for studying subjectivity (Brown 1993). Q-methodology is concerned with “operant subjectivity”, which is the naturally occurring subjectivity of the respondent (Brown 1980; McKeown and Thomas 1988). Although there are powerful statistics underlying Q-methodology, the method revolves around a science of subjectivity (Brown 1993). If a researcher were concerned about how objective traits are clustered together, R-methodology would be used. On the other hand, Q-methodology is useful if a researcher is focused on clustering like-minded perceptions that are subjective rather than objective.

Third, Q-methodology had different goals in that it seeks to capture a wide array of perceptions rather than make any claims regarding the population. On the other hand, R-methodology statistics seek to generalize. Q-methodology does not require a high response rate since it is focused on understanding a types of respondents (Stephenson 1953, p. 5; Brown 1980; Brown Under Review). For R-methodology, rigor is often associated with identifying a representative sample of the population of people; for Q-methodology, rigor is placed on the identification of the items in the concourse as representative of the population of statements in a domain.

Another difference is the sample size. For Q-methodology, Stephenson (1953, p. 5) points out “It is widely believed that it is essential to work with large numbers of cases in psychology, so that valid generalizations may be reached. We are to work, instead, with a single person, at the call of a theory.” Typically, there are around 50 respondents, such as Gottschalk (2001) which had 58 respondents and Steelman and Maguire (1999) which had 68 respondents. There are also several studies such as Shields and Cragan (1981), which used 400 respondents and stated that the large sample stabilized the factor structures and permitted a discriminant analysis to identify respondent characteristics. Also, Brown (Under Review) identifies studies that used larger samples.

A fifth difference is the task of the respondents. R-methodology entails rating and includes an assumption that the variables and their associated errors are independent of one another; Q-methodology is a ranking technique in which each individual ranking is dependent on all other rankings in any given Q-sort. Thus, with Q-methodology, the Q-

sort represents the respondent's coherent point of view on the concourse. The main problem with ratings is the lack of scale use and indifference among the topics. For example, in a study of 20 issues on a scale of 1 to 10, the mean response rate ranged between 5.4 and 9.1 (Brancheau, Janz and Wetherbe 1996). The Q-sort is "a modified rank-ordering procedure in which stimuli are placed in an order that is significant from the standpoint of a person operating under specified conditions" (Brown 1980, p. 195). Since the Q-sort requires the respondents' opinions and involves the task of ranking the items in the concourse, it is "an individual's conception of the way things stand. As such, it is subjective and self-referent" (Brown 1980, p. 6). An opinion necessitates an opinion-maker, implying some degree of self-reference. The Q-methodology preserves the respondents' self-reference (Stephenson 1953).

A sixth difference is the forced-distribution feature of the Q-methodology. The shortcomings associated with traditional questionnaires and surveys are avoided with the forced-distribution feature that requires that participants sort statements into a quasi-normal distribution (Nunnally 1978). Brown (1980) notes that the forced-distribution feature violates the independence assumption of statistical tests such as for ANOVA, yet points out that violating the forced-distribution requirement invalidates choice and psychological significance that underlies self-reference. Although controversy remains between free- vs. forced-distribution, Brown (1971) concludes that mathematically, the distribution does not matter since the factors are influenced far more by the ordering of the concourse than the type of distribution. Furthermore, Nunnally (1978) points out that the "criticisms are not well justified" (p. 615) for several reasons, such as "the exact

distribution form has little effect on the kinds of analyses which are made of the data” (p. 616).

Despite the inherent differences between Q-methodology and R-methodology, the analysis of Q-methodology does bear some resemblance to cluster analysis. The Q-sorting allows researchers to identify, categorize, and understand individual opinions and perceptions and to cluster groups based on perceptions (McKeown and Thomas 1988). Although groups are clustered, cluster analysis differs from Q-methodology as it does not revolve around the subjectivity that is part of the Q-methodology (Brown 1993). Also, the assumptions about the data is different since cluster analysis assumes independent responses between variables, whereas Q-methodology assumes that all responses are dependent on all others. Thomas and Watson (2002) also differentiates cluster analysis from Q-sort, based on two reasons: 1) Cluster analysis strives to achieve representation through a large sample and random sampling – Q-sort preserves the self-reference rather than achieving representation; and 2) Cluster analysis strives for groups of *objects* with broad categorizations with the researcher assuming that group members are homogeneous and that within a margin of error, their responses are identical – Q-sort creates groupings of *people* based on self-referent responses rather than on researcher grouping criteria.

As with any methodology, there are disadvantages. Respondents may feel limited because of the assigned grid. Furthermore, as in other types of questionnaire methodology, there may be some form of social desirability to sort the items in some way. Also, there is the potential of respondents’ viewpoints changing over time. One

other drawback is that typically Q-methodology is not used to make generalizations about the population at-large, although this may be achieved under certain restrictions.

Application of Q-Methodology

Q-methodology has been used in numerous studies, as Brown (1986) notes that over 1,500 publications have used this methodology and Brown (1993) notes that over 2,000 publications have used this methodology. Anderson (2003) notes that researchers have used Q-methodology in “communication, conflict resolution, counseling and intervention services, environmental research, feminism, gender issues, information systems management, leadership skill, operations management, organizational culture and person-organization fit, personality, political psychology, political systems, psychology, public policy, risk training and quality assurance, strategic decision making, and even violence in relationships” (p. 10).

Although Q-methodology has been used much more in non-IS research, some IS research has used this methodology. Q-sort has been used as the main methodology in IS articles to understand key IS issues (Gottschalk 2001), examine the competencies of software engineers (Turley and Bieman 1995), compare academics’ and practitioners’ views on key IS issues (Pimchangthong, Plaisent and Bernard 2003), examine project managers’ viewpoints (Tractinsky and Jarvenpaa 1995), study attitudes of analysts towards the development of information systems (Dos Santos and Hawk 1988), identify and examine groups of IT personnel (Wingreen, Blanton, Newton and Domino 2005), and identify and understand the importance of IS activities in organizations (Dos Santos

1989). Furthermore, Q-methodology has been used in conjunction with other methodologies (Kaplan and Duchon 1988; Kendall and Kendall 1993).

Thomas and Watson (2002) provides an in-depth explanation regarding Q-methodology and its use in IS literature and gives an example of its application. Furthermore, Thomas and Watson (2002) points out that Q-sorting can help MIS interpretive researchers by minimizing the influence of the researcher on the subjects, allowing readers to check the researcher’s interpretative bias through examining the data themselves, and providing a subjective understanding of groups.

Overview of Q-Methodology Steps

Brown (2004) suggests three major steps for Q-methodology – 1) Establish the concourse; 2) Administer the Q-sort; and 3) Factor Analyze the Q-sort. This is similar to the three steps and their components suggested by Thomas and Watson (2002) in Table 19 below:

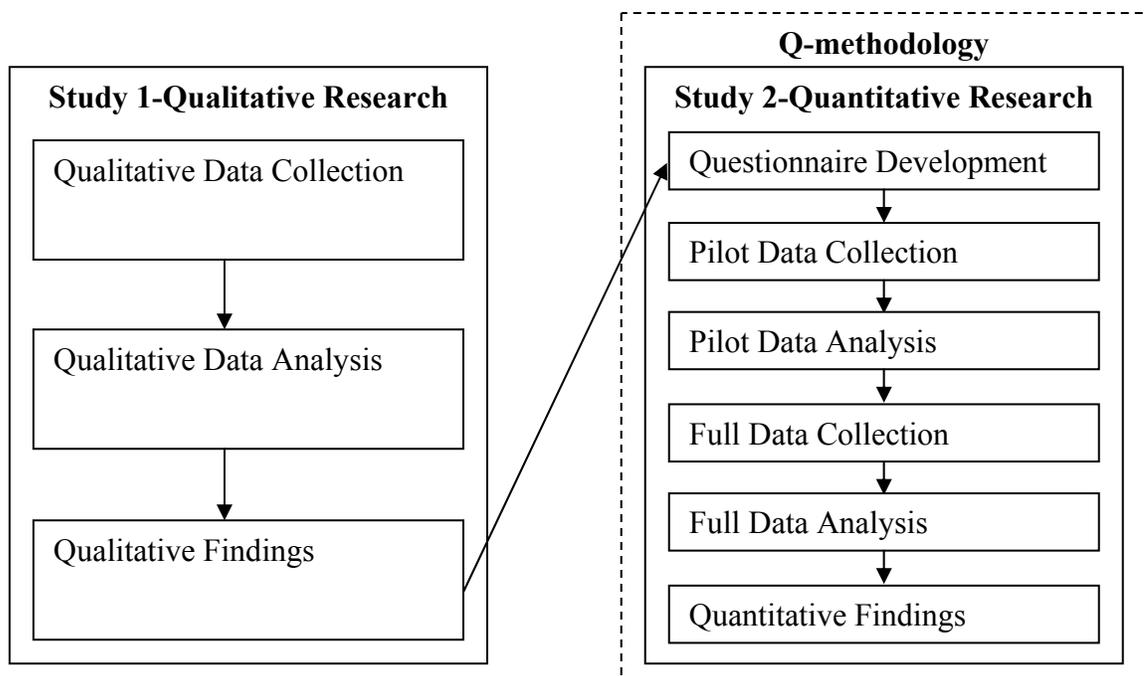
Table 19: Description of Steps

Step	Components of Step
Questionnaire Development	<ul style="list-style-type: none"> • Represent the topic with Q-samples • Decide the distribution
Pilot/Full Data Collection	<ul style="list-style-type: none"> • Ensure self-reference • Force the distribution • Randomize Q-sample initial ordering • Use a standardized format for Q-samples
Pilot/Full Data Analysis	<ul style="list-style-type: none"> • Factor analyze to produce groupings • Apply induction or abduction to produce insights

Adapted from Thomas and Watson (2002, p. 154).

In order to further clarify and expand on these three steps, Figure 5 was created, similar to the methodology of Anderson (2003). Figure 5 highlights three steps from Study 1. Study 2, which addresses research question #4, begins with the qualitative findings of Study 1. Based on the findings of Study 1, the concourse was established to be used in Study 2 as a basis for questionnaire development. As shown in Figure 5, questionnaire development is followed by pilot data collection and analysis, and then primary data collection and analysis.

Figure 5: Methodology



Adapted from the methodology used by (Anderson 2003, p. 11).

Step 1: Questionnaire Development

Generally, for a concourse, there are 30-60 statements that are used with scales such as -4 to +4 or -5 to +5 (Brown 1980) although scales may be used only ranging from -2 to +2, such as in Thomas and Watson (2002). Study participants then sort these statements in a quasi-normal pattern. Brown (1980) points out that the distribution may be more flat if topics are addressed that elicit strong, opposite opinions.

For the questionnaire development, the statements identifying reasons for resistance and the statements identifying behaviors were combined. This is in order to understand what statements were most representative of the user's experience during the implementation. Combining the reasons and behaviors led to a total of 29 statements that were in the concourse. It was determined that the 29 statements would be sorted from -3 to +3, as seen in Appendix F. A separate concourse was created to examine the desirability of various types of management strategies in the system implementation. This concourse had a total of 8 statements, with a scale of -2 to +2. Appendix H shows the various items and their corresponding concourse statement.

Following the recommendation of Brown (1993) that a Q-sort should be followed where possible with an elaboration of the respondents' point of view, qualitative questions followed both of the Q-sorts. These qualitative questions asked respondents why they chose the statements that were most extreme. The respondents' elaboration on the ranking of concourse items helped to further understand the respondents' points of view.

Step 2: Pilot Data Collection

The second step is the pilot test of the questionnaire utilizing a small convenience sample of ES users. The aim of the pilot test is to test the questionnaire and obtain feedback from the respondents regarding the content, length, and structure of the questionnaire. For the pilot data collection, 110 ES users in one organization were sent questionnaires. There were 35 questionnaires that were returned (32% response rate). Four of these questionnaires were not used because they were incomplete.

Step 3: Full data collection

The third step was the collection of the questionnaire data. As noted previously, most of the Q-methodology studies have sample sizes under 100. For the full data collection, a larger sample size was sought out for the purposes of understanding types of users in multiple organizations. A convenience sample was used for the data collection. A total of 317 ES user groups were emailed and an email was sent to three user group listserves. The emails sought out a person who would be willing to participate in the study by agreeing to distribute the questionnaire to 15-20 users within their organization. Only organizations that had rolled out a system less than three years ago were included in the data collection. There were a total of 24 members from these user groups that agreed to distribute questionnaires. Each of these members who agreed to participate received a packet of 20 questionnaires and business reply envelopes along with instructions on distributing the questionnaires (Except for two members, who received the questionnaire via email). Several weeks after sending out the questionnaire, a follow-up email was sent

to each of these members. It was found that a total of 354 questionnaires were actually distributed to ES users. 128 of these questionnaires were returned, which shows a 36.2% response rate from ES users who actually received the questionnaire. However, since 480 questionnaires were sent out to user group members to distribute the questionnaires, there was a 26.7% response rate to questionnaires that were sent out.

Step 4: Analysis of Pilot/Full Data Collection

For the analysis of the data, the Q-methodology uses factor analysis that accounts for variance shared among respondents. Generally the number of factors are selected if they have an eigenvalue greater than one, although Brown (1986) notes that it is not the absolute cut off value in the selection of factors. Brown (1980) discusses theoretical vs. statistical significance of factors and states that “statistical criteria may yield a factor that is not statistically significant, or ... may fail to extract a factor that is highly important theoretically. The general principle would therefore seem to be that theory and judgment must be relied upon in the absence of other criteria” (Brown 1980, p. 43). The factors that are derived are groups of study respondents that have similar Q-sorts.

In the analysis of the full data collection, Thomas and Watson (2002) was followed, which recommends that the analysis of the Q-sort should contain: 1) Factor loading arrays; 2) normalized factor scores; 3) the statement(s) on which arrays load. This can help the reader to both check and reinterpret the researcher’s logic, thus minimizing any errant effects of the researcher’s judgment on the interpretation of factors. Furthermore, Thomas and Watson (2002) recommends that the researcher should

use eigenvalues and a detailed factor analysis procedure to limit data manipulation. The Varimax Rotation seems to be the most common procedure used in Q-sort studies (McKeown and Thomas 1988). However, judgmental rotation is widely used if there are good reasons to abandon “simple structure” (McKeown and Thomas 1988, p. 52). Researchers using the Q-methodology often use Varimax or Quartimax rotation, although Q-methodology allows the judgmental rotation as long as it is in step with theory, which is termed “theoretical rotation” (Brown 1980, p. 39). McKeown and Thomas (1988) further points out that sometimes the centroid method is employed since it frees the researcher to approach the problem with “abductive logic” (McKeown and Thomas 1988, p. 53).

Reliability/Validity

Brown (1980) points out that individuals’ responses are at issue, not the operational definition, and thus “The concept of validity has very little status [in Q-methodology] since there is no outside criterion for a person’s own point of view” (Brown 1980, p. 174-175). Although it has been suggested that a comparable Q-analysis and R-analysis suggests some degree of validity (Brouwer 1992-1993), Q-methodology research overall has treated validity as irrelevant since the methodology is striving to understand the relative opinions of respondents. Dennis (1988) points out that the reliability and validity of Q-methodology lies in the data rather than the measure and that “ascertaining construct or predictive validity are inappropriate and irrelevant” (Dennis 1988, p. 413). Q-methodology is related more to qualitative research rather than

quantitative research in its approach to validity, since there is no substitute to a respondent's point of view (Dennis 1988).

Despite the minimal importance Q-methodology researchers have placed on validity and reliability, validity has been established in two ways. Validity has been established in the development of the concourse in that it was drawn from the literature and interviews (Dennis 1988). Also, content validity has been established in that the sample statements were reviewed by domain experts and tested in a pilot study. In regards to content validity, Dennis (1988) was followed as it recommends that domain experts should be used to ensure: “(1) items included in the Q-set constitute an adequate representation of the domain, (2) one cell is not overrepresented to the underrepresentation of another, and (3) the items are relevant to the domain studied” (Dennis 1988, p. 414).

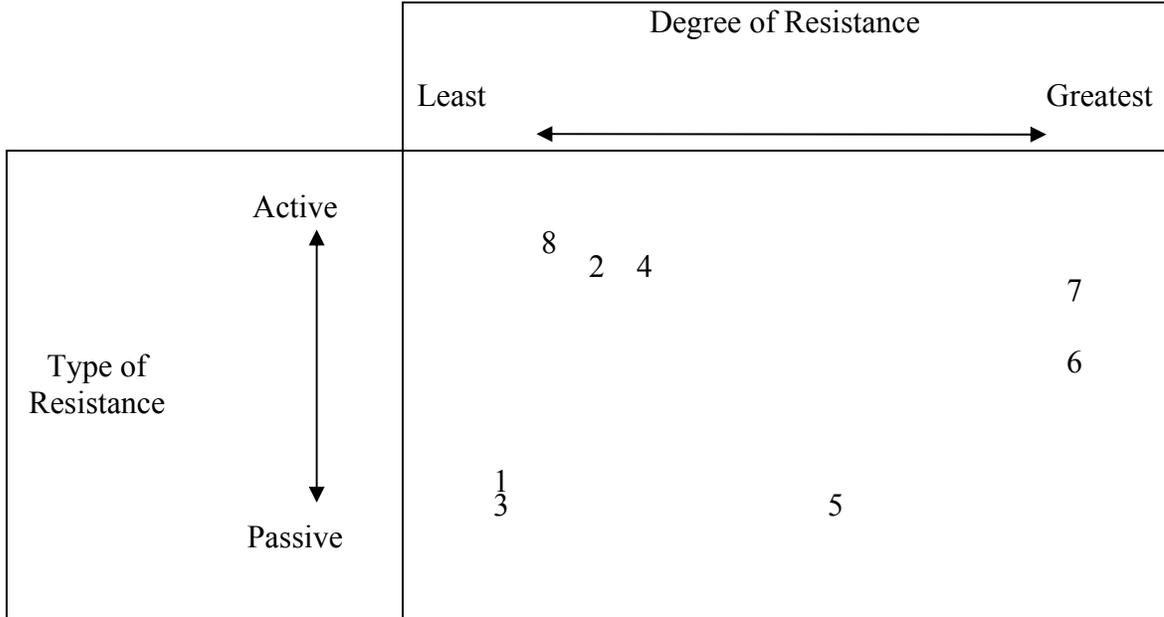
Results of Pilot Study

The purpose of the pilot data collection is to perform a preliminary check on the data and examine if types of users emerge from the data. For the limited amount of data (n=31) that was in the pilot test, 8 factors were selected for further analysis, based on the eigenvalues and the percentage of variance explained. These eight factors explained a total of 72% of the variance. A Varimax rotation, commonly used in Q-methodology, was used to extract the user types. Because of the small sample size, one of these groups only had one person in it, which leads to uncertainty regarding whether this is a type of

user or merely an individual. Thus, for the full-data collection, a larger sample was collected so that groups contain multiple respondents.

As for the factors that emerged, the two factors that explained the most variance (one factor explained 14% and the other factor explained 11%) had no resistance behaviors that were representative of their ES experiences. Three other factors had only one resistant behavior as representative of their experience (either system avoidance or challenged the system plan). The other three factors had multiple resistant behaviors, such as decreasing productivity, complaining, not wanting to learn the system, and avoiding the system. Based on how respondents indicated the resistant behaviors were representative of their ES experience, Figure 6 was derived. Figure 6 categorizes these 8 factors based on the degree of resistance (the degree to which they indicated resistance behaviors were representative of their ES experience) and the type of resistance (how active or passive the resistant behaviors were that were representative of their ES experience):

Figure 6: Categorization of Resistance by Factor Number



An analysis of preferred management strategies was also conducted. From the sample of respondents in the pilot study, it was clearly exhibited that management expertise was the most preferred management strategy. There are two strategies that are tied for second – training and management listening/responding to users.

Results of Full Data Collection

Preliminary Tests

In order to check for bias based on the ordering of the concourse statements, one of two potential questionnaires were randomly distributed to the respondents. The concourse statements in the second questionnaire were randomly changed around, so the ordering was different. A t-test was then performed to examine if there was any difference in the respondents’ ranking of the concourse items based on the questionnaire version. As

shown in Table 20 below, only two of the 37 concourse statements showed a significant difference at $\alpha=0.05$. However, to hold the experiment-wise error rate at an alpha of 0.05, significance is shown at a value below $0.05/37$, or 0.0014. There was no statistically significant difference found at $\alpha = 0.0014$. Thus, the ordering of the concourse statements likely made no difference to respondents.

Table 20: T-test for Equality of Means among Two Questionnaire Versions

Concourse Item	t	df	Sig. (2-tailed)
CON1	1.131	125	0.260
CON2	1.243	125	0.216
CON3	2.129	125	0.035
CON4	-0.701	125	0.485
CON5	-0.836	125	0.405
CON6	-0.804	125	0.423
CON7	0.984	125	0.327
CON8	-2.598	125	0.011
CON9	-1.191	125	0.236
CON10	1.306	125	0.194
CON11	0.444	125	0.658
CON12	-0.694	125	0.489
CON13	1.939	125	0.055
CON14	-1.485	125	0.140
CON15	-0.096	125	0.923
CON16	-1.132	125	0.260
CON17	0.588	125	0.558
CON18	1.254	125	0.212
CON19	0.648	125	0.518
CON20	-1.743	125	0.084
CON21	-0.296	125	0.768
CON22	0.379	125	0.706
CON23	-0.778	125	0.438
CON24	-0.684	125	0.495
CON25	1.090	125	0.278
CON26	0.030	125	0.976
CON27	-1.065	125	0.289
CON28	-1.324	125	0.188
CON29	1.241	125	0.217
CON30	-1.273	125	0.205
CON31	0.239	125	0.811
CON32	0.779	125	0.437
CON33	0.557	125	0.578
CON34	-1.478	125	0.142
CON35	0.171	125	0.864
CON36	1.306	125	0.194
CON37	0.078	125	0.938

A second t-test was performed in order to check for non-respondent bias. There were some respondents who only filled out the demographic portion of the questionnaire rather

than filling out the whole questionnaire. In order to check that the demographics of the responders who completely filled out the questionnaire were no different than those who did not completely fill out the questionnaire, a t-test was conducted, as shown in Table 21 below. None of the demographic variables were shown to be significant in this t-test. The details of the demographic information of the respondents are displayed in Appendix J.

Table 21: T-test for Equality of Means among Respondents who filled out the Questionnaire fully versus those who did not

Demographic Item	t	df	Sig. (2-tailed)
Gender	-1.474	149	0.143
Education	1.025	148	0.307
Years in Position	0.382	145	0.703
Years at Employer	1.233	145	0.220
Age	-1.539	133	0.126
Position	0.458	132	0.647
# of Employees	1.217	147	0.225
Org. Industry	0.848	149	0.398
System Scope	1.972	144	0.051
System Vendor	0.957	148	0.340
Days of Training	-0.798	136	0.426
Days before Usage	-0.098	129	0.922

The Q-sort responses indicated on each questionnaire were entered into PQMethod, a statistical program specifically tailored for use with Q-methodology. This software is often used with Q-methodology studies. In the analysis of the data, the intercorrelations of the Q-sorts were calculated, then factor analyzed. A principal components factor analysis was first conducted to view the eigenvalues and percentage of variance explained by each factor, shown in Table 22 below.

Table 22: Principal Components Factor Analysis

Factor #	Eigenvalues	Percentage	Cumulative Percentage
1	30.22	23.61	23.61
2	7.91	6.18	29.78
3	7.39	5.77	35.56
4	6.63	5.18	40.74
5	6.41	5.01	45.75
6	5.35	4.18	49.93
7	5.15	4.02	53.95
8	5.00	3.90	57.86

For the purposes of this research, eight factors were selected, explaining a cumulative 58% of the variance. Eight factors were selected for two reasons: 1) there was a slightly larger gap between the eigenvalues of the eighth and ninth factors than there was between the other factors; and 2) eight is a sufficient number of groups to analyze, since the purpose of this research is to identify the main groups that form from the data analysis, not to explain every group/factor that exists. The eight factors identified were then rotated using a Varimax rotation, commonly used with Q-methodology studies to identify the factors that maximize the amount of variance.

Research Question 4a: User Groups

Table 23 below shows the factors that were identified using the PQMethod software with Varimax rotation. For the analysis of the factors, the concourse statements that were most representative of the user groups' ES experience were identified (-3 is the most representative of their experiences, +3 is the least representative of their experiences). The highlighted factors in Table 23 are the top third of concourse statements that respondents indicated were representative of their ES experience.

Table 23: Factors of User Groups (Normalized Factor Scores and Statement Rankings)

Concourse Statement	1	2	3	4	5	6	7	8
REAS-Uncertainty	-0.91 30	0.29 15	-0.79 27	1.00 7	-0.59 29	0.63 13	1.11 6	0.21 21
REAS-Lack Input	-1.58 34	-0.54 25	-0.80 28	-0.54 27	-0.10 23	0.25 16	1.39 2	-0.48 26
REAS-Lose Control	-0.91 29	-1.01 30	-0.29 22	1.28 3	-0.76 30	1.09 5	1.31 5	-0.96 31
REAS-Self Efficacy	0.80 8	0.28 16	-0.38 23	-0.06 20	-0.27 26	-1.78 37	-0.53 28	0.25 20
REAS-Changed Job	-1.75 36	-1.03 32	-0.45 24	-0.29 25	-2.24 37	-1.56 34	-1.19 32	-1.42 34
REAS-Workload	-1.98 37	-0.01 20	-1.56 36	-0.95 30	-2.07 36	-1.10 30	-1.50 34	-0.77 28
REAS-Technical Problems	-0.85 28	0.29 14	-0.96 30	-1.44 33	-0.97 32	-1.75 36	-1.90 37	-1.31 33
REAS-Environment	-0.29 24	0.79 11	-0.81 29	-1.28 32	-0.05 22	-1.41 31	1.35 3	-0.88 30
REAS-Lack of Fit	-1.01 31	0.80 9	-1.30 34	-1.96 36	-0.92 31	-0.77 29	-1.41 33	-1.11 32
REAS-Communication	-0.55 26	-0.06 23	-0.23 20	-1.63 35	0.28 15	0.19 20	0.50 12	0.29 19
REAS-Training	-0.53 25	1.30 5	-0.70 26	-0.84 29	0.75 8	0.22 19	1.34 4	-0.32 25
REAS-Complexity	-0.14 23	1.13 6	-1.44 35	-0.96 31	-1.07 33	-0.62 27	-1.76 36	-0.85 29
BEH-Challenged	-0.09 22	-0.80 27	0.12 17	-0.20 23	0.21 18	-0.01 24	-0.22 23	0.39 16
BEH-Dont Follow Processes	0.61 13	-1.05 34	0.61 13	0.37 16	0.93 6	0.67 9	-0.26 24	0.40 15
BEH-Shadow System	0.07 20	-1.83 36	0.61 14	0.85 11	1.10 4	0.64 12	0.00 17	0.69 7
BEH-Old System	0.05 21	0.33 13	0.67 12	-0.23 24	0.50 12	1.01 6	-0.34 25	0.60 10
BEH-Avoid	0.65 11	0.84 8	0.95 8	0.40 15	0.67 10	0.23 17	0.49 13	0.48 12
BEH-Inappropriately	1.00 7	-0.54 26	0.37 15	0.25 17	0.09 20	1.69 2	-0.16 21	0.65 9
BEH-Hack	1.19 4	-1.04 33	1.15 6	0.87 10	0.25 17	1.23 4	-0.05 20	0.32 17
BEH-Refusal	1.79 1	-1.02 31	0.78 11	1.24 4	0.36 14	0.67 10	0.06 16	0.93 4
BEH-complain	0.30 16	1.38 3	-0.48 25	0.47 14	-0.32 27	0.10 23	-0.40 26	0.41 14
BEH-Defensive	0.75 9	0.02 17	0.35 16	0.17 18	0.27 16	0.67 9	0.06 16	0.72 6
BEH-Demotivated	0.20 18	0.79 11	-0.06 19	-0.14 21	-0.13 24	0.64 12	0.73 11	0.13 22
BEH-Less productivity	0.48 15	0.00 19	0.87 9	0.72 12	0.03 21	0.29 15	-0.05 20	0.84 5
BEH-Impatient	1.10 5	-0.03 22	-0.25 21	-0.56 28	0.36 13	-0.58 26	-0.19 22	-0.58 27
BEH-Quit	0.16 19	-0.49 24	1.53 3	1.51 1	1.71 2	-0.12 25	-0.05 20	0.04 24
BEH-Dont want to learn system	0.55 14	1.34 4	1.16 5	0.94 8	0.60 11	0.15 21	1.09 7	1.09 3
BEH-Turnover Intention	0.29 17	0.57 12	1.33 4	0.89 9	1.01 5	-0.72 28	0.36 14	0.04 24
BEH-Procrastinated	0.72 10	-0.81 28	0.05 18	0.09 19	0.69 9	0.11 22	0.87 9	0.29 18
MGMT-Communication	-1.13 32	0.01 18	1.05 7	-0.36 26	2.00 1	-1.64 35	-1.72 35	1.20 2
MGMT-Feedback	-1.63 35	-0.02 21	-1.14 33	1.17 5	-0.39 28	0.82 7	-0.64 29	0.67 8
MGMT-Provide Support	0.64 12	0.87 7	-1.06 31	1.39 2	0.79 7	0.22 19	-1.05 31	0.41 13
MGMT-Training	1.30 3	-1.85 37	-2.03 37	-0.17 22	1.28 3	-1.44 32	1.05 8	-2.19 37
MGMT-Incentives	1.74 2	-0.82 29	0.82 10	1.00 6	-2.03 35	-1.48 33	2.13 1	2.85 1
MGMT-Clear Plan	-0.81 27	-1.83 36	-1.06 32	-2.08 37	0.14 19	1.69 2	-0.64 30	0.52 11
MGMT-Expertise	-1.25 33	1.60 2	1.69 2	-1.57 34	-0.27 25	0.30 14	0.74 10	-1.50 35
MGMT-Customizations	1.02 6	2.13 1	1.69 1	0.67 13	-1.84 34	1.47 3	-0.52 27	-2.05 36

In Table 23 above, the responses greatly varied depending on the group. In group 1, resistant behaviors were not among the top third of concourses selected. This group identified various reasons for resistance and management strategies to minimize user resistance, but did not exhibit resistant behaviors. Group 2 exhibited the most resistant behaviors. Six of the seven behaviors highlighted are active behaviors, with only one behavior that is passive (procrastination). From management's perspective, this is the group that is most resistant. In order to minimize the resistance, the top three management strategies identified by this group are training, incentives, and a clear plan. For group 3, only the overt, passive behavior of complaining was identified. To minimize the complaining, management can provide better feedback, support, training, and a clear plan. Group 4 exhibited only the covert, passive behavior of impatience as part of the top behaviors identified. This group identifies that better communication, a clearer plan, and management expertise would have been the most useful management strategies. Group 5, like group 3, only has complaining as the resistant behavior exhibited. However, there were different reasons for user resistance identified among these two groups as well as different management strategies. Group 6 identified impatience, turnover intention, and actual turnover (quitting) as the most representative behaviors. This group identified management communication, training, and incentives as the most important management strategies that should have been implemented better. Group 7 had complaining and using the old system as the most representative behaviors, and identified five management strategies. This group had system complexity and technical problems as the top reasons for user resistance. Group 8 identified impatience

as the top resistant behavior, similar to group 4, but had different reasons for user resistance and management strategies.

To further understand each of these groups, the qualitative portion of the questionnaire was analyzed to determine if these groups made sense based on the supporting qualitative data. The qualitative portion is comprised of three questions asking the reasons for why the respondent choose the most and least representative statements. Each of the eight groups had respondent statements that supported the results of the quantitative analysis shown in Table 23 above. Appendix I provides examples of qualitative quotes from each of the eight groups.

An additional analysis was conducted to examine if any of the demographic variables might have a statistically significant effect on the user group. Thus, an ANOVA was conducted to determine if there are demographics that have significant effects between factor groupings. As shown in Table 24 below, no statistically significant effects were found at $\alpha=0.05$. Although demographic information could be provided for each group, this analysis indicated that none of the groups have statistically significant differences from the demographics of the overall questionnaire. Therefore, no groups were found to have any demographics different than those found in Appendix J, which provides tables on all the demographic data.

Table 24: Analysis of Variance based on Factor Grouping

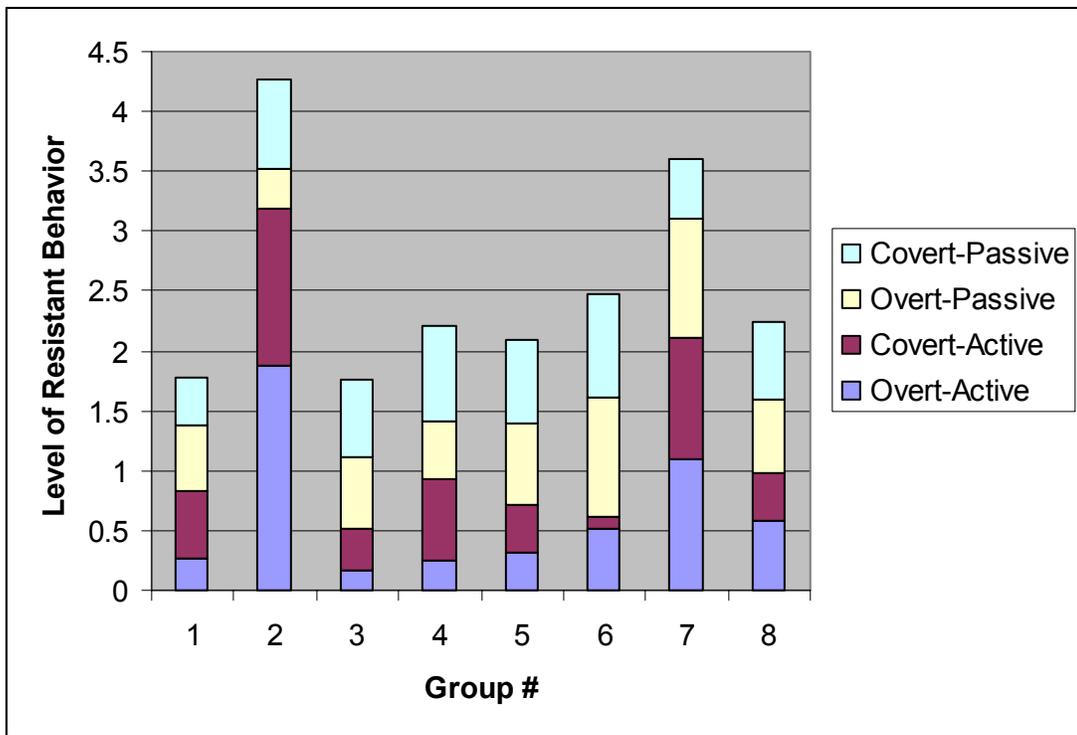
		Sum of Squares	df	F	Sig.
Gender	Between Groups	3.00	7	1.898	0.083
	Within Groups	15.36	68		
	Total	18.36	75		
Education Level	Between Groups	11.41	7	1.699	0.124
	Within Groups	65.26	68		
	Total	76.67	75		
Years in Current Position	Between Groups	123.69	7	1.329	0.251
	Within Groups	877.26	66		
	Total	1000.95	73		
Years in Organization	Between Groups	183.10	7	0.567	0.780
	Within Groups	3046.66	66		
	Total	3229.76	73		
Age	Between Groups	9.65	7	1.502	0.183
	Within Groups	56.93	62		
	Total	66.59	69		
Position	Between Groups	15.41	7	1.015	0.430
	Within Groups	132.24	61		
	Total	147.65	68		
System Vendor	Between Groups	13.12	7	1.361	0.236
	Within Groups	93.62	68		
	Total	106.74	75		
Days of Training	Between Groups	5644.62	7	1.203	0.315
	Within Groups	41568.32	62		
	Total	47212.94	69		
Days Between Training and Using Live System	Between Groups	101865.13	7	1.360	0.239
	Within Groups	641950.11	60		
	Total	743815.24	67		

Research Question 4b: Resisting Groups

Another step was performed on each of these eight groups in order to understand the resistant behaviors of each group. All of the resistant behaviors were categorized by the Overt-Covert-Active-Passive 2x2 matrix developed by (Bovey and Hede 2001). Based on the ranking of all the resistant behaviors for each group, the relative difference was calculated for each cell of the 2x2 matrix. This was calculated for each group by adding

1 to the Z-score for each of the four resistant behaviors (so that there would not be any negative values). The results of the relative resistant behaviors among the groups are shown in Figure 7 below. Clearly, group 2 showed the most resistant behaviors, and in particular, overt-active behaviors. This is followed by group 7, which had a high degree of overt-active, covert-active, and overt-passive behaviors.

Figure 7: Resistant Behaviors by Group Number



Research Question 4c: Management Strategies

In order to determine what management strategies are identified by users that will be most effective in minimizing the level of resistance, Z-scores were calculated. As shown in Table 25 below, a clear concise plan is the most desirable management strategy for users. The second most desired strategy is for the managers to have more expertise in the

system and in rolling out the system. The third most desired strategy is better top-down communication.

Table 25: Rank Ordering of Management Strategies

	Z-Score	Concourse Statement
Management Strategies	-0.805	MGMT-Clear Plan
	-0.680	MGMT-Expertise
	-0.227	MGMT-Communication
	-0.086	MGMT-Feedback
	-0.039	MGMT-Training
	0.453	MGMT-Customizations
	0.531	MGMT-Provide Support
	0.797	MGMT-Incentives

In addition to the management strategies, as shown in Table 25 above, there are several reasons for user resistance that emerged as the most important reasons. As shown in Table 26 below, the additional workload was the most significant reason for user resistance, followed by a lack of fit, technical problems, and changed jobs. In regards to resistant behaviors, challenging the management plan was the most representative of ES users' experiences, followed by impatience, complaints, and then trying to use the old system.

Table 26: Rank Ordering of Reasons for User Resistance and Resistant Behaviors

	Z-Score	Concourse Statement
Reasons for User Resistance	-1.836	REAS-Workload
	-1.516	REAS-Lack of Fit
	-1.500	REAS-Technical Problems
	-1.406	REAS-Changed Job
	-1.141	REAS-Complexity
	-0.703	REAS-Environment
	-0.633	REAS-Lack Input
	-0.508	REAS-Communication
	-0.195	REAS-Training
	-0.078	REAS-Uncertainty
	-0.039	REAS-Self Efficacy
	0.023	REAS-Lose Control
Resistant Behaviors	-0.203	BEH-Challenged
	-0.047	BEH-Impatient
	0.039	BEH-Complain
	0.344	BEH-Old System
	0.352	BEH-Defensive
	0.359	BEH-Procrastinated
	0.391	BEH-Unmotivated
	0.578	BEH-Inappropriately
	0.594	BEH-Don't Follow Processes
	0.641	BEH-Less productivity
	0.758	BEH-Shadow System
	0.758	BEH-Avoid
	0.828	BEH-Hack
	0.859	BEH-Turnover Intention
	0.992	BEH-Don't want to learn system
1.023	BEH-Quit	
1.344	BEH-Refusal	

CHAPTER V. CONCLUSIONS AND FUTURE DIRECTION

The implementation of an ES in organizations has forced many employees to adopt a system that changes their job duties and reward structure. These mandatory, role-transforming systems have faced considerable resistance, though often it is covert. There are obviously contributing factors that affect employee responses to a system, as mentioned earlier in this paper, such as lack of top management support and project team competence (Akkermans and Van Helden 2002). However, even when the appropriate planning, analysis, and design have been performed, there are still many times that implementations have failed or faced unwarranted difficulties because of user resistance. The following sections discuss the results from both studies, the contributions of the two studies, the limitations of this dissertation, and future directions for this research.

Discussion of Study 1

Underlying reasons for user resistance, resistant behaviors, and management strategies to minimize user resistance were found and described in Study 1. Furthermore, the constructs were classified into categories. These findings showed several unique aspects of an ES change that do not exist in organizational change not facilitated by technology. For example, the ES-enabled change added the complexity of technical problems and employees needing to learn a complicated system. Furthermore, a portion of the employees face a lack of computer self-efficacy and additional skills are required

for jobs, such as needing to know how to perform queries. Also, in regards to management strategies, employees expect management to have expertise in the system, and to perform system customizations. These expectations would not exist in an organizational change not facilitated by technology.

Markus (2004) revolves discusses organizational change facilitated by technology and differentiates technology enabled change versus redesigning organizational structures without technology. In differentiating these two types of change, Markus (2004) suggests that there are different target outcomes, solutions, role of managers, and key success factors. Using the term “technochange” to describe the use of technology to drive organizational change, Markus (2004) describes “technochange” as different from most IT projects, since many IT projects merely adjust work processes minimally, rather than driving organizational change. Furthermore, Markus (2004) suggests that misuse, non-use, and failure risks are very high with technology-enabled organizational change, yet IT project management approaches do not focus on these issues.

Comparing the Results to Other Studies

As mentioned in the literature review, there was no publication found that conducts a research study to understand the underlying reasons for why users resist. However, there are several publications that have discussed potential reasons for resistance based on literature reviews. In the following paragraphs, first of all the findings of reasons for user resistance are compared to two publications. Next, the findings of management strategies to minimize user resistance are compared to one

publication. Finally, the results are compared to user acceptance literature. As seen in the comparisons, this dissertation has identified several constructs not identified in the publications, and modifies some constructs that were discussed in these publications.

The first comparison is with Hirschheim and Newman (1988), which focuses on ten reasons for user resistance that are based on a literature review. Table 27 below identifies the constructs suggested from the Hirschheim and Newman (1988) literature review and the definition of each construct. These are compared with the reasons for user resistance found in the results of this dissertation.

Table 27: Comparison with Hirschheim and Newman (1988) – Reasons

Hirschheim and Newman (1988) Construct	Hirschheim and Newman (1988) Definition	This Dissertation
Innate Conservatism	“reluctance to change the status quo” (p. 399)	Job/Job Skills Change
Lack of Felt Need	“individuals...have not been convinced of the merits of the change” (p. 399)	Communication
Lack of Involvement in the Change	“Individuals [feel] that they have been excluded from the decision-making process associated with the change” (p. 399)	Input
Redistribution of Resources	“disruption of the status quo [including] departmental budgets, equipment, staff, and territory... status, salary, roles, etc.” (p. 399)	Control/Power
Organizational Invalidity	“mismatch between specific features of system design and characteristics of the existing organization” (p. 400)	Lack of fit & Facilitating Environment
Poor Technical Quality	“systems which are... ‘unfriendly’, unreliable, lack functionality and slow” (p. 400).	System Complexity, Technical Problems
Uncertainty	“see change as a threat and possess a fear” (p. 399)	Uncertainty
Poor Training	“users are not properly trained to use the system” (p. 400)	Training

As seen in the table, there are eight constructs that are similar to the constructs found in this dissertation, which are discussed below. There are also two constructs found by this dissertation not found in Hirschheim and Newman (1988) and two constructs discussed in Hirschheim and Newman (1988) not found in the dissertation, which also are discussed below.

The first construct identified, “Innate Conservatism”, is a different construct from “Job/Job Skills Change”, but these reasons have similar roots. The job/job skills change may result in user resistance because of the innate conservatism, but since the job/job skills change is what initiates the resistance, it is the underlying reason for user resistance that management can control.

“Lack of Felt Need” and “Communication” also are different constructs, but have similar roots. Poor communication may lead to a lack of felt need since users do not understand the benefits of the system or why it is being implemented. Thus, poor communication is likely the underlying reason for the lack of felt need experienced by the users.

The constructs “Lack of Involvement in the Change” and “Input” are similar. However, Hirschheim and Newman (1988) is more focused on involvement on the system decision and participation in development in the system. This dissertation found that the users were not very interested in the initial system decision or participation in

development of the ES; rather, they were interested in management seeking their thoughts and opinions for the implementation.

There is also similarity between “Redistribution of Resources” and “Control/Power”. However, Hirschheim and Newman (1988) is focused more on power issues whereas this dissertation includes both loss of power and loss of recognition as an expert. Thus, the findings of this dissertation lead to a slightly broader construct.

For “Organizational Invalidity” and “Lack of Fit & Facilitating Environment”, Hirschheim and Newman (1988) identified one broad construct. However, this dissertation identified two different constructs which both are part of what is described by “Organizational Invalidity”. The difference between the two constructs identified in this dissertation is that “Lack of Fit” is the process problems that occurs when new processes are implemented, but “Facilitating Environment” is the affect of the organizational culture and the ability of an organization to infuse a technology.

In regards to “Poor Technical Quality” and “System Complexity & Technical Problems”, the construct discussed by Hirschheim and Newman (1988) encompasses the two constructs of system complexity and technical problems that are described in this dissertation. These are separated in this dissertation since it was found that system complexity often exists with an ES even if technical problems do not exist. For other types of systems, there may be technical problems even though the system is not

complex. Therefore, system complexity and technical problems should be addressed as two separate reasons for user resistance.

The last two constructs, “Uncertainty” and “Poor Training” are identical constructs to the “Uncertainty” and “Training” found in this dissertation. For many systems, these two reasons for user resistance are common and management should address these issues.

There were also two reasons identified by Hirschheim and Newman (1988) not found in this dissertation. One reason not found in this dissertation is “Lack of Management Support”, which Hirschheim and Newman (1988) defines as failure of management “to support and encourage the change” (p. 400). This dissertation found “Providing Help/Support” as a management strategy useful in minimizing user resistance that arises from various reasons for user resistance, rather than identifying it as a reason for user resistance. The second reason identified by Hirschheim and Newman (1988) not found in this dissertation is “Personal Characteristics of the Designer”, which is defined as “difficulties that many system developers have in interacting with users” (p. 400). This was not found in the interviews because every organization implemented an ES software package rather than designed their own system.

Finally, there are two reasons found in this dissertation not identified by Hirschheim and Newman (1988). These two reasons for user resistance are “Self-Efficacy” and “Workload”. These are important reasons for user resistance, and very

applicable to an ES implementation, but were not identified in the description of Hirschheim and Newman (1988).

One other study that the dissertation results are compared to is Markus (1983), which discusses how there are some user attributes, technical attributes, and power/sociotechnical issues that affect the level of resistance. In particular, this article focuses on power issues, discussing how user resistance remains until the users feel compensated for the lost power. In Table 28 below, the results of this dissertation are compared and contrasted with the reasons for user resistance identified by Markus (1983). As seen in the table, there are some similar issues between this dissertation and Markus (1983), but there are also reasons for user resistance found in this dissertation that were not identified in Markus (1983).

Table 28: Comparison with Markus (1983) – Reasons

Issues identified by Markus (1983)	Issues identified in dissertation	Discussion
User Attributes – cognitive style, personality traits, human nature	Individual Issues – Uncertainty, Input, Control/Power, Self-Efficacy	The dissertation results identify specific constructs that can be used to measure individual issues rather than identifying general categories of reasons
Technical Attributes – Lack of user-friendliness, poor human factors, inadequate technical design or implementation	System Issues – Technical Problems, Complexity	Although these cover similar areas, the dissertation identifies specific constructs that can be measured
Power/Sociotechnical Issues – Interaction of the system and the context	Organizational Issue – Facilitating Environment	The power that Markus (1983) discusses is included in the Individual Issues for the dissertation, because of its dependency on the individual's desire for power/control. The sociotechnical issue is similar to the facilitating environment identified in the dissertation
	Process Issues – Job/Job Skills Change, Workload, Lack of Fit; Organizational Issues – Communication, Training	Markus (1983) does not address the process issues that are inherent to an ES implementation or the organizational issues of communication and training

In regards to management strategies, Kotter and Schlesinger (1979) discusses management strategies to deal with resistance, and also provides examples of situations where combinations of management strategies would be used. Table 29 below compares the suggested management strategies of Kotter and Schlesinger (1979) with the management strategies identified in this dissertation. As seen in the table below, Kotter and Schlesinger (1979) addresses two management strategies that were not found in this

dissertation (Manipulation/Cooptation and Explicit/Implicit Coercion). Although there are situations in which these strategies may be useful in minimizing resistance, Kotter and Schlesinger (1979) also warns that these strategies can lead to future problems if employees feel that they are manipulated and that the strategies are risky, since employees may be angry at change initiators. Due to the long-term results of such strategies, these strategies are not used often. For example, Hunton and Beeler (1997) notes that coerced participation may be ineffective in gaining the positive involvement, responsibility, intention to use, and ownership that ultimately affects system success. From a user's perspective, these two strategies are not desired, and thus were not found in the interviews that were conducted with users in Study 1.

Table 29: Comparison with Kotter and Schlesinger (1979) – Management Strategies

Issues identified by Kotter and Schlesinger (1979)	Issues identified in dissertation	Discussion
Education and Communication	Top-down Communication	Kotter and Schlesinger (1979)'s explanation of Education and Communication focused on informing employees about the change, which is similar to Communication in this dissertation
Participation and Involvement	Listen to Feedback	These are very similar issues, which is basically involving employees in the change
Facilitation and Support	Training; Provide Help/Support	These are similar. Kotter and Schlesinger (1979) includes emotional support when referring to "support", which is included in "Provide Help/Support" in the Dissertation
Negotiation and Agreement	Incentives	Kotter and Schlesinger (1979) focuses more on working with unions and thus providing incentives and negotiating with the union in order to support the change
Manipulation and Cooptation	Not in Dissertation	Kotter and Schlesinger (1979) suggests including a leader, such as a union leader, in a desirable role in the change in order to gain support from other employees
Explicit and Implicit Coercion	Not in Dissertation	Kotter and Schlesinger (1979) suggests implicitly or explicitly threatening employees with a potential loss of job or lack of promotion
Not in Kotter and Schlesinger (1979)	Clear Consistent Plan	Although Kotter and Schlesinger (1979) refers to educating users of the plan when referring to "Education and Communication", it does not mention a clear, consistent plan in order to minimize resistance
Not in Kotter and Schlesinger (1979)	Management Expertise	Kotter and Schlesinger (1979) does not suggest increasing the understanding of managers in regards to the processes and/or system
Not in Kotter and Schlesinger (1979)	System Customizations	Since Kotter and Schlesinger (1979) is just referring to organizational change, system issues are not addressed.

The results also are compared to a user acceptance study. Perhaps the most comprehensive user acceptance study is Venkatesh et al. (2003) which includes 32 potential independent variables based on eight different models. These variables are examined and synthesized to develop the Unified Theory of Acceptance and Use of Technology. Part of the study examines the effect of the 32 independent variables on intention to use, examined in a mandatory adoption setting. The results are displayed in a table that displays the significance of these independent variables on intention, tested in three different time periods (Venkatesh et al. 2003, p. 441). In Table 30 below, the independent variables that were found to be significant in at least two of the three time periods are shown and compared to the reasons for user resistance found in this dissertation.

Table 30: Comparison with Venkatesh et al. (2003)

Significant Independent Variables that Predict Intention	Comparable Reason for User Resistance Found in Dissertation	Comparison of the results
Attitude Toward Using Technology	None	Although attitude is likely to affect resistant behaviors, only the root causes of user resistance were sought out in this dissertation
Subjective Norm	Facilitating Environment	Although these are different constructs, there are external forces that affect the attitudes and behaviors of users
Perceived Usefulness	Communication	Through the communication of the benefits of the ES, users form their opinion on its perceived usefulness
Perceived Ease of Use	Communication, Technical Problems, Complexity	The communication to the users as well as the technical problems or complexity of the system likely affect the user's perceived ease of use
Extrinsic Motivation	None	Extrinsic motivation was not identified as a root cause of user behaviors in both the interviews or questionnaires
Intrinsic Motivation	None	Intrinsic motivation was not identified as a root cause of user behaviors in both the interviews or questionnaires
Job-Fit	Lack of Fit, Job/Job Skills Change	These are similar constructs. When the system does not fit the job, or users need to develop new skills or perform new tasks, there is likely to be negative behaviors
Social Factors	Facilitating Environment	These are similar constructs as they both revolve around the environment of the user
Relative Advantage	Workload, Job/Job Skills Change	Perceptions of relative advantage can stem from the changes in workload, job tasks, or job skills
Image	None	This construct was not found in any of the interviews
Outcome Expectations	Control/Power	Outcome expectations is a broad category that includes the gain/loss of control or power
Self-Efficacy	Self-Efficacy	Same constructs
Anxiety	Uncertainty	Similar constructs since uncertainty is a cause of anxiety

As shown in Table 30 above, there are some similarities to what user acceptance research has proposed as the predictors of intention and what this dissertation research has found to affect user resistance. Despite some similarities, Table 30 also provides comments on the differences between the constructs. Furthermore, Input and Training were found to be reasons for user resistance, but are not related to any of the constructs identified in Venkatesh et al. (2003). Previously in this dissertation it was stated that the opposite of user resistance is not user acceptance, since users can resist while seemingly accepting or using the system. However, there are some similarities between the driving forces of user acceptance and user resistance, as shown in Table 30. The user acceptance research stream may benefit by considering some of the reasons for user resistance as antecedents to a user's intention to use a system.

Managing the Reasons for User Resistance

The first reason for user resistance described in the results section is Uncertainty. Users often are unclear of the future and view the system as a potential threat to their job and/or work life. Management can address this issue through top-down communication and clear, consistent plans. Through conveying important details and clearly addressing issues such as why the system is being implemented and the extent of the project, users will better understand what is required and the changes that will occur. A clear vision may entail promoting the system as able to provide seamless integration among the multiple departments and numerous employees connected through the ES. In an ES implementation, a "sponsor" can also be useful in convincing those involved how the benefits of the ES outweigh the costs. Through credibility and trust, it is likely that this

leader can create strong alliances throughout the organization. Management should also clearly demonstrate their commitment and support for the ES implementation since a long-term commitment keeps employees from being distracted from the project. Ross et al. (2000) notes that managers demonstrated commitment to the project by assigning their best people full time to the project, clearly developing a business case for system use that has clear objectives, demand status reports based on well-established objectives, communicate goals and scope of the project clearly, and establish and articulate a long-term vision. Newman and Sabherwal (1996) focuses on commitment to a project and found that psychological and project determinants were the most influential in an employee's commitment to a project. If employees perceive chronic problems to exist without a solution, commitment will diminish. Newman and Sabherwal (1996, p. 27) provides a list of managerial determinants of commitment.

The second reason for user resistance is a lack of Input, as there are a number of times a user's opinions are not considered or sought out by management. User involvement has been studied in a number of research publications. For example, Ives and Olson (1984) found that ES implementations are more likely to succeed when user involvement is high. This is different from user participation; Barki and Hartwick (1989) distinguishes between user participation and user involvement, stating that user participation is "a set of behaviors or activities performed by users in the system development process" while user involvement is "a subjective psychological state reflecting the importance and personal relevance of a system to the user (Barki and Hartwick 1989, p. 53). In regards to ES research, one study stated that ES research has

not studied user involvement and satisfaction in depth (Esteves and Pastor 2001). In order to better seek the input of users, communication channels must be available to receive communication from users. Salopek (2001) suggests that management needs to involve users from the beginning as well as redefine leadership roles and negotiate with users. The facilitation of these management strategies can be improved through tactics such as opening the communication lines between management and users (De Jager 1994).

The third reason for user resistance is Control/Power, since some users end up losing control or recognition as an expert. Thus, often times, there is a leveled playing field because someone who is newly hired may have as much expertise as someone employed for many years. Green, Collins and Hevner (Under Review) found that perceived level of control affects the level of user satisfaction. This reason for resistance is difficult for management to mitigate, as bringing in a new system often requires the loss of expertise of the old system. However, through listening to feedback from the “expert” users and conveying the necessity of the new system, the users’ level of resistance may be reduced.

The fourth reason for user resistance listed is Self-Efficacy. A lack of self-efficacy may exist because of a lack of confidence in the skillset needed for the new system, such as a lack of computer skills/abilities. Computer self-efficacy has been studied in various publications and has been defined as “an individual’s judgment of efficacy across multiple computer application domains” (Marakas, Yi and Johnson 1998,

p. 129). Marakas et al. (1998) also points out that there is a difference between task-specific and general computer self-efficacy. Even for users with general computer self-efficacy, they may lack self-efficacy in regards to the ES because of task-specific self-efficacy. One study that examined computer self-efficacy found that it affects the perceived ease of use towards new systems (Agarwal, Sambamurthy and Stair 2000). In fact, Kotter et al. (1979) states that one reason for resistance is that users feel their skill-level is inadequate. One management strategy to deal with low self-efficacy is to provide training to increase the skills and confidence of the users. Also, providing user support mechanisms can be effective (Bendoly 2000). The training and the user support mechanisms can be complementary. It is an understandable human nature that people resist situations if they feel unskilled or that their abilities are lacking. Thus, a lack of training or lack of support may manifest itself through user resistance.

A fifth reason for user resistance is the technical problems with the system, such as bugs in the system and features that do not work right. This can be minimized through increased management expertise, such as bringing in consultants and experienced decision-makers who develop an appropriate timeline that allows for testing the system. Furthermore, through effectively providing help and support, technical problems can be dealt with promptly, which should mitigate the level of user resistance.

A sixth reason for user resistance is the complexity of the system, such as the difficulty to access data or a poorly designed user interface that is not intuitive. Initially, the analysis of various ESs and selecting a less complex ES would be useful in

minimizing future problems. However, once a system is selected, useful training should be able to minimize the impact of the complexity on user resistance. Furthermore, through communication channels that receive feedback from users, appropriate system customizations can be made to minimize the complexity.

A seventh reason for user resistance is the Facilitating Environment, such as an organization that has a bureaucracy which is not conducive to change. Large organizations usually are not able to change their environments quickly. However, through training management to gain expertise in the system and organizational change, the impact of user resistance may be minimized. In addition, customizing the system to better fit the organization may be useful.

An eighth reason for user resistance is Communication to users, such as a lack of communication or not conveying to users the benefits of the system and the “whys” of the change. One way to address this issue is through frequent and repetitive communication to users regarding the vision, the plan, and potential outcomes of the ES. Planning is a very important part of the vision as it can weave the implementers’ and organization’s culture together. A communication plan can also be used to facilitate the vision and goals. Oliver and Romm (2002) discusses the vision of integration that is presented to employees as a reason for ES adoption. This vision may encompass conceptions of teamwork and synergy, and suggest that the ES may bring about harmony for the organization (Oliver and Romm 2002). The decision makers should share the vision and goals, and clearly articulate the means to achieve the goals. The plan should

emphasize the benefits to the individuals who are to follow the vision and achieve the goals and be flexible enough as to encompass all necessary tasks and permit delays. The communication of the benefits may also lead to users supporting the system to a greater degree. Baronas et al. (1988) writes that “More important than the actual changes implementers might make are their skills at communicating them to users, and linking them into users’ experiences” (p. 121). Communicating with all involved parties, setting suitable expectations, and frequent progress report meetings can be useful in communication.

A ninth reason for user resistance is Training. Training is problematic when users perceive training to be a waste of time, that trainers are incompetent, the timing of training is inappropriate, or a lack of training. A case study found that although users were briefly trained in using the new system, all employees did not feel comfortable, which led to the fear of being laid off, decreased morale, as well as decreased job satisfaction (Mainiero and DeMichiell 1986). Umble et al. (2002) argues that a failure to train users to take advantage of the system’s features guarantees that implementation problems will arise. Bingi et al. (1999) also identifies the importance of training, and states that although adequately training employees for ES use is a major challenge, it is necessary as employees need to know how to do their job and how the data they enter affects the rest of the organization. Appropriate training is an important management strategy to mitigate these issues.

A tenth reason for user resistance is Job/Job Skills Change, since users often undergo revised job descriptions or must perform different job tasks or develop new skills and new ways of thinking for the job. Kotter et al. (1979) notes that performing new behaviors, working with different people, or assuming different roles makes employees uneasy, contributes to low tolerance for change. However, it has been found that when users have realistic expectations, ES implementations are far more likely to succeed (Ives and Olson 1984). For example, Ginzberg (1981, p. 475) found that the “degree of realism of users’ pre-implementation expectations was positively correlated with a range of project success measures, both attitudinal and behavioral.” Another management strategy to minimize the degree of changed jobs is to customize the system. However, often times this will not be done because part of the reason for the ES is to change inefficient processes. For example, Ross and Vitale (2000) discusses how a CEO talked about during the firm’s first implementation, customization requests were considered, but how the steering committee rejected customizations during the second implementation. Although system customizations often are not performed because of cost, performing the customizations mitigates this reason for user resistance. Additionally, a company may consider a strategy to provide incentives to users so that they feel compensated for the change they encounter as they adjust to new job tasks and skills.

An eleventh reason for user resistance is Workload, as users often need to exert additional effort to perform the same task or need to take work home in order to complete it on time. Employers could address this issue by setting forth appropriate incentives that

compensate users for the extra work. Some organizations, whether or not they are implementing an ES, provide bonuses based on performance and/or workload. This could also be used for users that learn and adjust to a new system. Furthermore, management may be able to minimize some of the resistance through effective training. In the short-term, training requires additional efforts; however, in the long-term, trained employees should be more productive and able to accomplish tasks in less time.

The final reason for user resistance is Lack of Fit, due to the problematic changes to processes and new processes not working as planned. Leifer (1988) describes how the technology needs to fit an organization, that a technology may fit some organizations and not others, and that many organizations must change their organizational structure to fit the technology. Although this is difficult, it may be necessary in order to remain competitive or to implement strategic change. Through customizations, the system can better fit the organizational structure. Furthermore, training managers and the implementation team to be more knowledgeable in understanding both the processes and the system leads to a better fit between the system and new organizational processes.

Discussion of Study 2

Study 2 examined the types of users, focusing on the characteristics of users, the types of resisting users, and the desired management strategies identified by these groups. There were eight groups that were examined, two of which had a greater degree of resistant behaviors. Due to the lack of other studies examining groups of users, there are not other studies to which results can be compared. There clearly are groups of users that

emerge from the analysis, which is consistent with both the quotes identified in Study 1 and previous studies that suggest types of users exist. Because of the lack of other studies in this area, this study sets the groundwork showing that user groups exist and describes the user groups.

In comparing the pilot data and the full data collection, both sets of data collection suggests that there are a wide variety of user groups. Due to the limited data collected in the pilot study, an in-depth comparison between the two data collections has not been performed. However, for the pilot study, five of the groups exhibited a small degree of resistant behaviors, one group exhibited a medium degree of resistant behaviors, and two groups exhibited a large degree of resistant behaviors. For the full data study, two groups exhibited a large degree of resistant behaviors while the other six groups exhibited small or small/medium levels of resistant behaviors. Despite the different users that were examined in the two data collections, user groups with resistant behaviors were identified in both data collections. A practical implication is that resistant user groups are likely to exist and management should seek to understand these groups.

From a manager's perspective, knowing that various groups exist in an ES implementation can lead to strategies that better meet the needs of the various groups. For example, each of the eight groups identified in the results had a different set of reasons for user resistance. To some groups, a lack of input was important while to other groups, the uncertainty was important. Therefore, depending on the employees, some may want to be on a planning committee while others do not; others need some computer

training classes while others do not; and some want to have more top-down communication while others do not mind having only minimal communication.

In regards to the overall results for the respondents, the management strategies that were shown to be the most desirable to users are a clear plan, management expertise, and top-down communication. Although each group has different preferences, these three were shown to be the most important overall to users. Managers should also be aware of the reasons for resistance that were most often present during implementations. The top five reasons, in order of representativeness to ES implementations, are additional workload, lack of fit, technical problems, changed job, and system complexity. If possible, managers should try to minimize the potential problems that arise from these areas. For example, the problem of lack of fit could be minimized through spending more time to find the best system suitable to the organization and have organizational change management in place to alter any necessary processes prior to the system implementation. There are many other suggestions provided in the “Managing the Reasons for User Resistance” section of this chapter.

Despite the collection of various demographic data, one surprising finding was that there were not any respondent demographics identified that differentiated the groups of users. Although this could be due to insufficient statistical power, the implication is that both resisters and non-resisters exist from all demographic backgrounds. For example, age, gender, education level, and years with employer do not affect the level of resistance or the user group which best fits an employee.

Contributions

There are several contributions of this dissertation. First, the ES implementation is examined from a user resistance perspective; as user resistance is a reason why a technology is not adopted, this research modifies the current understanding of the user acceptance literature. As the second chapter points out, there are many studies that have examined user acceptance, with user resistance sometimes considered the opposite of user acceptance. This study argues that user resistance is not the opposite of user acceptance and differentiates the two concepts, since user resistance can still occur, even when acceptance appears to have occurred. Based on the user resistance findings of this study, researchers and practitioners can have a better understanding of the difference between user acceptance and user resistance.

A second contribution is a better understanding of why users resist an ES. In spite of the recent increases in the number of ES publications, there is not a compelling explanation in describing the phenomenon of user resistance and its underlying causes. This study conceptualizes user resistance, providing a framework that includes an explanation as to why it occurs during ES implementations.

A third contribution is providing an understanding of how user resistance manifests itself through behaviors. Although some studies have suggested ways users may resist a system, this study looks specifically at ES implementations and the types of

behaviors that are exhibited by users. Through a qualitative analysis, specific resistant behaviors are identified, described, and set into a framework.

A fourth contribution is the identification and analysis of management strategies to minimize user resistance. A framework was developed for these management strategies and their effects on user resistance are described. As identified previously, there are many critical success factors and management strategies that have been identified that may or may not work depending on the contextual factors. This study has suggested specific management strategies useful in minimizing the level of user resistance in ES implementations.

A fifth contribution is the understanding of types of ES users. There has not been any research found that has been conducted in this area. Yet, an understanding of types of users, and in particular, resistant groups, is key to understanding how to mitigate user resistance. Users ranked the reasons for user resistance that were most representative of their ES experience. This research both explores the area of resistant groups and the characteristics of these groups. Furthermore, it sets the groundwork upon which future theories can be built.

A sixth contribution is an understanding of the management strategies most desired by users and perceived to be the most important in minimizing the level of user resistance. Based on the eight general strategies identified in Study 1, users provided feedback regarding the management strategies desired during the implementation. The

assumption is made that the most desired management strategies are also the most useful in minimizing the level of user resistance.

Limitations

Although the researcher strived to minimize potential limitations of the research, there are several limitations. In regards to the qualitative interviews in study 1, generalizability is an inherent limitation. There is no assurance that the individuals that were interviewed are representative of the population. To minimize the impact of this limitation, interviewees were sought out from multiple organizations and in multiple positions within those organizations.

In regards to the interpretation of the interview transcripts, independent coders were used for reliability purposes. However, only the researcher and two independent coders analyzed the transcripts in depth. Since both coders were trained by the researcher and used the coding scheme developed by the researcher, there could be bias in the coding. To minimize this limitation, multiple quotes from the interviewees covering each construct were selected and shown to other researchers who checked the statements.

Another potential limitation for both studies is based on the bias of interviewees and questionnaire respondents, which were reflecting on their own ES experiences. One aspect of this bias results from some respondents responding to the questionnaire regarding an experience they had two years previously. Even though respondents may be trying to provide accurate information, they may have a skewed view concerning what

actually happened. Furthermore, as Lapointe and Rivard (2005) found, resistance may change over time and thus it is possible that some respondents reflected on resistance at an early point while others reflected on resistance at a later point. Another bias is social desirability, which may have occurred in the interviews and may have affected the responses of some of the interviewees. For example, interviewees may not have discussed their own resistance to the system in order to present a certain image about themselves. This impact of this limitation was minimized through the use of interviewing multiple people within the same organization as well as distributing questionnaires to multiple users within the same organization.

In regards to the Q-methodology, respondents were asked to rank the concourse statements by placing them into a Q-sort, which has a fixed distribution. Although there are advantages to this form of response which are discussed in the Q-methodology description, the limitations are that respondents may feel that the concourse statements should be distributed in a different way. For example, some respondents may feel that several concourse statements are highly representative of their ES experience while the rest are not representative of their experience and have a hard time figuring out how to arrange the various concourse statements into the fixed distribution. This limitation was minimized through having questionnaire respondents fill out several qualitative questions describing why they had chosen the statements at either end of the fixed distribution.

In regards to the generalizability of Study 2, a convenience sample was used. Packets of questionnaires and business reply envelopes were distributed to members of

various user groups. The users which received the questionnaire from these user group members were not randomly selected among the general population; rather, they were people known to the user group members who may have filled it out as a favor to the user group member. The result is that certain groups may have been underrepresented, such as small businesses that do not have a user group member. Thus, although the respondents represented many different positions within many different organizations, it may not be representative of the overall population. To minimize the impact of this limitation, user groups from various ES vendors were selected in order to represent a wide variety of businesses that implement an ES.

Future Research

This dissertation provides a foundation upon which future research on user resistance can be built. One future direction for this line of research is developing a model of user resistance based on the key drivers for user resistance. This line of future user resistance research would also examine and identify which reasons are the most important in the determination of behaviors. Although there were a number of reasons and behaviors discussed in this dissertation, it is likely that there are certain reasons that are the key drivers. This line of research would encompass more empirical research.

Another direction for user resistance research is understanding the lifecycle of an implementation and how user resistance changes throughout the lifecycle. For example, both Markus and Tanis (2000) and Markus et al. (2003) discuss the phases of an implementation. Markus et al. (2003) expands on Markus and Tanis (2000), but both of

these discuss problems and successes in the phases of ES implementations. ES success does not just occur from a one-time implementation, but rather through on-going improvements (Kraemmergaard and Rose 2002). Understanding the lifecycle of an ES would be useful in developing effective management strategies and ultimately affect the level of user resistance.

An equally important future direction is a psychological understanding of the users' perspectives. For example, Eagly and Chaiken (1995) discuss Attitude Strength, Attitude Structure, and Resistance to Change. For a user, there may be negative perceptions towards the ES and the change; however, the attitude strength and structure has not been examined. It is possible that if an attitude is not strong enough, even though users may have negative perceptions, resistant behaviors will not exist. On the other hand, users with negative perceptions and a strong attitude may exhibit a greater degree of resistance.

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APPENDIX A: SAMPLE QUOTES FOR REASONS FOR RESISTANCE

* Names and other identifying information have been changed from these quotes

Table A-1: Sample quotes for reasons for resistance

Construct	Sample Quotes
Uncertainty	U17- People did perceive from my experience it as a threat to their job. Oh, they're not going to need me quite as much or Oh, I'm not going to be able to use this system and they're going to fire me if I can't use it kind of thing
	U18- it was just the concept of the unknown. How is this really going to work, how is this really going to function, is really going to do what they're telling us it's going to do.
	U19- Some new features in the system were unclear on how they're going to work... I think a lot of that fear and concern had to do with that they weren't sure how they were going to get their jobs done
	U12- I think people were afraid of how it was going to change their jobs because they were very scared
Input	F1(3)- Most people really hated it and didn't understand why they weren't asked about it or anything. It was just "here's the new system-enjoy..." The general idea is that the people who actually do the work have had the least amount of input on how the system turns out.
	U3- You may not want my input, but it's important to me... you don't ask my opinion then fine I don't want to be involved with it, but July 1 st is approaching and your job is changing and you have to. Those were the folks that you had to smooth over.
	U14- We tried very hard to tell people. People said your system - it's not my system, I didn't buy it, I didn't implement it anymore than I could, I did the vanilla like everybody told us to do.
Control/Power	U3- Using the state system, having it for 20 years - they were experts in their field - all of the sudden, you have leveled the playing field. And the new person coming off the street knows just as much about the system as you do, so you are no longer an expert.
	F1(6)- Some people liked the old system a lot better, who were the "experts" – they would resist more, because with the changes, everybody starts at square one – you don't have that advantage or comfort zone... For example, customer service people wanted to be the "go-to" people.
	U12- in their boss's eyes they were the experts, they knew they could hand them anything and their bosses just thought they were wonderful. Now they're faced with a system they don't know that well, they don't want to look incompetent and sometimes you have to look incompetent until you learn a system. And people don't want to go through that, they don't want to disappoint their supervisors, or look incompetent in front of their supervisors.

Self-Efficacy	<p>U8- there's a large population at the university that they're not computer savvy. Whatever computer use they have is here at work. They do very little at home... I'm going to retire in a couple of years, I don't need to learn this. I just don't like computers is what one lady told us, she wasn't going to use the system. She was going to have someone else in her department learn it, computers scared her.</p> <p>U1- I'm not the account person so it probably was more difficult for me. Say, a young person coming in at this point who's account savvy wouldn't have a problem.</p> <p>U6- I feel very uncomfortable for the fact that I feel like I cannot balance my accounts like I used to balance them before.</p> <p>F1(2)- because they were afraid of entering the wrong code, and so they didn't want to take part in any of the user acceptance testing.</p>
Technical Problems	<p>U2- they weren't able to access their budgets for six months.</p> <p>U7- There were lots of glitches at the beginning. Very often we found it just wasn't working. It just wasn't doing what it was supposed to be doing.</p> <p>U14- I can tell you what happened and I can't tell you why it happened and I can't necessarily fix it. Which is the biggest frustration that we have. We see its wrong, the system let you do it wrong, but now it won't let you fix it. You know, so it's very frustrating. People are frustrated with it.</p> <p>U22- if you get to a certain point, you can't print it, but then if you do one of two things and then you go to print it and won't print and it's been a nightmare. I hate it. I absolutely hate it.</p> <p>U11-The system had a lot of bugs in the beginning and it had a lot of bugs at the training, it didn't help us sell this thing, even at the training it would crash, so.</p>
Complexity	<p>U2- The system is so complicated... It doesn't make sense for most of us. Let me know when you find somebody who can read one of their reports and access it. The hardest part is to access.</p> <p>U9- In terms of how we derive the information, how we get the numbers that we need, it's much more complex... It's much more difficult, much more frustrating and I have many more people driving me crazy with questions</p> <p>U2- I have a secretary in the naval ROTC program, who is going to use the system for the second time in two years, because the system is so complicated... people in the trenches can write a better interface and they know what people want to see and how it reads cleanly.</p> <p>U20- some people were excited by it because it was new, but by the same token there were some people who were afraid of it because it's new, because it's definitely a more complex system that we had previously.</p>

Facilitating Environment	U3- You want to talk about change - I think it's just a paradigm shift, especially in this environment - the university is slow to change. The bureaucracy just creates that.
	U8- for some reason it's a struggle to make that change here and I think it goes back to there was no one ever in place empowered to do it before, so any kind of change to try and give that person that power is met with resistance. And out in the private world, there is no, I'm not going to do it that way, it's you will do it this way or you will work some place else. And that's not the culture here at the university.
	U12- there's a lot of, what I would just call, self service attitudes, ... It's not in my job description, I'm not doing it. And the system introduces and lot of crossover where you need to be kind of able to do more, if you're going to be kind of like me, doing many things, you've got to be able to interface with a lot of different departments and lot of different skills.
Communication	U15- I don't think it was communicated, maybe at a very high level it was communicated clearly, but not down to the trenches.
	F1(4)- I know at our organization with the system, they didn't communicate. There really wasn't much communication as far as the goals or benefits or anything like that. Now, in hindsight, you can see that ... there are benefits after the fact, but that was not communicated, so there was pain when there was no system at all – there was no discussion of “We know it sucks now, but it's going to be great in 6 months” – there's not even that type of communication.
	U6- No, I didn't have no knowledge whatsoever of the system. A lot of information went on with e-mail. Communication with e-mail, but as far as the system itself, I learned about it when I attended the training.
	U3- communication is very bad here at the university and it gets filtered down person by person.
Training	U10- It seems like they did not offer enough training after the system was put in.
	U2- And those [training] classes drive me nuts. Because they work with the lowest common denominator - the slowest person in the class drives the class.
	U7- I witnessed some people getting just exasperated because the people who were training them were not that knowledgeable in the subject matter and uh, you know it's hard to say whose fault that is... I've got to tell you some of those trainings were terrible and when you walked out of there you didn't know much more than when you walked in.
	U9- there has not been enough training, there continues to be not enough training, I mean the training just gets less and less.

<p>Job/Job Skills Change</p>	<p>U2-... from the high muckety-mucks, that's wonderful. But from the little people's level, that's a fucking pain in the ass. Because instead of just processing the piece of paper we now become purchasing agents, payroll clerks, and HR reps. It's a nice concept ... it's great if you're at the top.</p>
	<p>U1- some people have been here 20 or 30 years – it's just real hard for them to change. It was hard to just start using a computer. I mean we used to use reams and reams of paper with stuff on it. You get a hard copy – somebody else did the programming for you - now you do it yourself... Everybody here had to unlearn and look at it from a different perspective and that's not always easily.</p>
	<p>U19- now the skill sets required on the part of organization's staff have changed. You know, it's less about going to the file draw and rifling through or pulling out reports and building some sort of spreadsheet. Now it's a query, but you need to understand what tables the information resides on, what the field names might be.</p>
	<p>U12- a lot of the issue now you really do have to know a little bit of accounting to be able to operate efficiently in the system and people don't know that and accounting debits and credits are a mystery to most people.</p>
<p>Workload</p>	<p>U9- Some of those people are really, really struggling. So it's definitely made our jobs more time consuming. More frustrating also... I've had to stay late plenty and do things at home... what I used to be able to do in a short amount of time takes much, much longer... you still have the same amount of work to do, it's just taking more time to do it.</p>
	<p>U22- It takes much; much longer to do the same the thing, to get a requisition in here takes about 90 steps... The previous system was very easy... It was very, very different, but once I got into it, it was very easy to move around in.</p>
	<p>U8- I have a 40-hour a week job for the department that pays me and now you want me to do this system work as well.</p>
	<p>U6-[[So it sounds like everything takes longer.]] Of course, definitely, definitely.</p>

Lack of Fit	<p>U8- In the past the invoices came to the individual departments. We checked them, made sure they were correct; if they were wrong we got the vendor to send us a new invoice, whatever. Well during the solution design labs the central unit said no all invoices were notifying the vendors that all invoices were coming to accounts payable. You will not see them any more, if you put in the correct amount on the purchase order there will be no problems. We said you don't realize what we do with the invoice. Nope. As Eric who's in charge of accounts payable said, you're all resisting change. It took them one week of receiving all the invoices to be overwhelmed. As Eric later said, I just didn't realize how much you worked with the vendors on getting the correct invoices or getting discounts, you know, and that was that whole mentality carried across all of the different modules. The people in the trenches out in the departments were saying, well these are the things you need and instead trying to listen to them to meet them half way, it was nope and because of that there was that really resistant when the system got turned on.</p>
	<p>U14- For a university this large to have only three or four people doing purchasing is ridiculous. But that's because the money is basically in the administrative units and they get the responsibility of handling the details. The system's not made for that. That's one of the reasons we were resistant.</p>
	<p>U7- Another difference ... was the departments and colleges would not receive the invoices directly, that accounts payable would receive the invoices. And people were not receptive to that either because how does accounts payable know that we received everything. You know, that really should be something that should stay with the departments and the colleges.</p>
	<p>U3- We had accounts payable that was back-logged, they couldn't pay invoices, we were spending \$100s of \$1,000s in late fees... Because they didn't change anything. They didn't know how to pay the invoices. There's supposed to be a three-way match.</p>

APPENDIX B: SAMPLE QUOTES FOR RESISTANT BEHAVIORS

* Names and other identifying information have been changed from these quotes

Table B-1: Sample Quotes for Resistant Behaviors

Behavior Category	Sample Quotes
Overt-Active	U2- [The behaviors I have seen are] Quitting or not using it. I have three secretaries who won't use it – flat out will not use the system. And they've gone to the training. But they will not use it... I fired one person in 38 years. I find it a lot easier to make their lives miserable and get them to quit.
	U4- There were some that very aggressively challenged us and actually had an effect of the design itself... A couple of things that we wanted to do in the billing area were challenged from a couple of colleges around the campus and we backed off and said okay, that's not going to serve you well and we came up with an alternative plan.
	F1(6)- They think it is their right to do whatever they want and they don't have to participate in any of our systems... So they resist by just not doing it the way we want them to.
	U2- there are people who have quit rather than learn new systems – they've retired.
	U22- Well people were getting very, very frustrated, Very frustrated, in fact, I mean, Andrea just got so frustrated and they were just so overwhelmed over there so she just found a job in another department and she doesn't use the system at all and I have some friends who have left areas where they were and we don't use it.
Overt-Passive	U11- They would like to complain that they couldn't do it. They wouldn't go to the training, but they would also complain.
	U8- it was a whole two or three months of I don't like this, I'm not going to use it
	U7- People were very frustrated. It affected morale. People were saying that they who chose to initiate this system into the university were not those working with it.
	U15-I had many people call me. I'm not sure why they called me, but they said I'm going to quit, because I can't handle the system. Okay and what are you going to do, why would you want to do that?
	U7-here are 100 angry people walking in [to the orientation session], they don't know what to expect, they're all defensive
	U9- there's a lot of people wanting to make job changes.
Covert-Active	U3- And everybody was saying, I want to keep my shadow system, because I know what's in this, I can report off this. It's double work, and we were encouraged to get rid of the shadow system, we need to quit this double data entry.

	<p>U4- I guess one way we discovered who they were - they were coming to the cashier office the old way; even bring the codes from the old system.</p>
	<p>U20- I think people could do what they needed to do in the system, but were somewhat afraid, but they avoided what they needed to do in the system.</p>
	<p>U22- Most people avoid the system; most people do avoid the system.</p>
	<p>U8- even though you know its wrong, instead of figuring out what was happening with the wrong information, they would just go in and change it enough to make the transaction go through and therefore they considered their work done, but then we had bad data out there and no one's gone back to correct that bad data</p>
<p>Covert-Passive</p>	<p>U20- They weren't as productive as they needed to be from the university standpoint because they were hesitant and unsure about themselves in using the system to its fullest capability... part of the issue does fall back on us to provide training to the best extent we can on some things that we haven't done yet like queries in the system and people understanding the tables in the data warehouse.</p>
	<p>U21- Impatient, especially in the training. Okay, just show me; just get it over with, why does it take so long... you see people become impatient and make little jokes about the system is not really fast and you know all the time spent, so impatience probably with most of us.</p>
	<p>F1(3)- It was ... waiting until the very last moment to go to training. They had to extend the window for training since nobody signed up for training until the last two weeks. So they had to redo their whole schedule and make more people available to do the training, so it kind of passive resistance.</p>
	<p>U18-[[In training...]] I could hear typing when there was nothing to be typing, so I know they were answering their e-mails or whatever they were doing.</p>
	<p>U11- they don't want to be in the training. They're not as receptive and the information takes a lot longer to get in there and it's a lot harder... if I don't sign up for it it'll go away, if I don't learn this I'll be able to keep my old way of doing it. It was just like a refusal to admit we're moving on. I would see that. People would wait till the last minute. Again, just trying to refute the whole thing.</p>

APPENDIX C: SAMPLE QUOTES FOR MANAGEMENT STRATEGIES

* Names and other identifying information have been changed from these quotes

Table C-1: Sample Quotes for Management Strategies to Minimize Resistance

Management Strategy	Sample Quotes
Top-down communication [Positive comments]	U4- we tried first to convince them that the change was one mandatory, two needed and three beneficial to them.
	U8- I think the key things to have the implementation go better would have been communication and involvement of the larger organizational community
	U13- there was communication going out all the time and I think they went to various management meetings saying this is where we are and this is when it's coming
	U17- from the change management perspective we were trying to communicate the benefits and the whys, the compliances... [it was] possibly over communicated with to the point where people may have deleted the e-mail without reading it. It was more about the changes, more about the news, the benefits were in it though, I'm sure.
	U18- I think communication was one of the aspects that they used. I know leading up to the go live, there were constant e-mails and information going out on our organization's home page to organizational newsletters... In terms of helping to at least let the people know that this was coming.
	U14- Yea, they used to have a lot of meetings and they'd come and tell us what their long term goals were.
Top-down communication [Negative comments]	U18- we had literally people that I received calls from after the system went live, a week or two weeks after the system went live that were still trying to log into the old systems to do their requisitions and, you know, I was like, you know, have you been on an island or in a cave or were you on vacation because the old requisition system is gone. There's a new day a coming. I have to do today for my department. So, sorry, you're out of luck. There were literally people that just paid no attention... there's still people that just literally chose either not to listen or just paid no attention to it because they didn't think it applied to them.
	U3- communication is very bad here ... they did try to improve it - they created web sites, they created lists of questions and answers.
Listen to Feedback [Positive comments]	U10- I know that the management team listens to what the people have to say and their complaints and they try to address
	U3- they kind of came in and met with us as a group, getting our concerns, what are you concerned about, what are you afraid of, what do you want to see happen, what don't want to see happen.

	<p>U11- Using the feedback instruments, using the formal communication, using what we experienced in the training class. A lot of empathy. I can tell you there was a lot of that because we could see people struggle with this thing. We weren't meaning to cause people stress or, on the contrary we wanted to help them through this thing. Empathy. A lot.</p>
	<p>U3- they did a survey of computer knowledge. I took the survey myself and I think they pretty much put it out to the whole community, and if you said you were going to be a user of this, then you had to take this survey. "Do you know how to turn on a computer?" I mean it was absurd, and I just laughed at that. Do I know how to turn it on? And when I got involved as a trainer that was one of things that came up – was this really the talent we have here at the university that you have to ask that question and they said, "Unfortunately, yes." You have people in the past that have not gotten onto the computer, but they're going to need to now with this system. So, yes, there were just certain people that just did not have the capacity or ability to use the computer, and to get into such a complex system as this was overwhelming for them.</p>
Listen to Feedback [Negative comments]	<p>F1(6)- And so complaints flow uphill to a point, and then they stop there, and then they don't go any higher, because these people in between can't make decisions anyway, so they're not going to make boss' day bad by complaining about it, because they don't have to deal with it and they don't want to make their life hard by making VP's life hard, so it just stops part-way up the tree.</p>
	<p>U3- [[Did they distribute a questionnaire to solicit opinions?]] They did do a little bit of that, but probably too late, you'd already closed people up.</p>
Provide Help/Support [Positive comments]	<p>U7- if [the shadow system that simplifies the creation of reports] had not been implemented, I think things would have been worse. I really do.</p>
	<p>U21- they had certain hours set up, they had specific questions, you can go in, they had computers set up so you could actually show facilitators what your problem was</p>
	<p>U18- I went from just a packed open lab to now I'm running it every other month and it's probably five or six people at a time. So I think that really helped.</p>
Provide Help/Support [Negative comments]	<p>U6- You were just left on your own. You could go to this one or that one, but you were practically on your own.</p>
	<p>U8- [with the new system] there's 12 ways to get the same information. Out of 12 reports, there's one that really has everything that you know. We haven't instructed the community on how to go to that one report, so the community gets frustrated because they tried report number one through five and it just didn't give them the information, so they just forget it.</p>

<p>Training [Positive comments]</p>	<p>U7- That's why I went back to the trainers. They have to be confident; they have to be told they are knowledgeable of the material. They really have to go above and beyond. They have to take the work home with them to learn it; they have to spend weekends learning. You know, they really have to be dedicated to it and I really don't think that was the case. Aside, and of course, case in point is then when I had James it was obvious that he worked on this 24/7 or close to it, you know and that's what so impressive about him and you could just tell. Because you know how hard he worked to learn it.</p> <p>U10- as soon as the trainers were in there and found out what the differences were and they immediately got that information out to people and incorporated it into their training.</p> <p>U3- So, going in there and knowing already who is going to be my problem child – trying to greet them as they come in and encourage them to sit in the front of the class, so that you're more closely to them, that you can just take one step back and look at their screen and make sure that they're on track... One of the things that I did when I first started day one when I was teaching this class, I had a little Power Point thing and I showed a bunch of runners to say that this is the race to learn the system and here are you guys back here in this little cluster, right back here at the end and guess what I'm just a couple of steps ahead of you. Then you got these other folks up here, you've got the vendors' experts and then you've got some of our experts and then you got us, but we only started this only two months before you started to walk through the door, so don't expect too much from me. So at least tried to lower their expectations quite a bit.</p>
<p>Training [Negative comments]</p>	<p>U3- it's day two, you need to review what we went over day one and what are we going to do on day two and so he was throwing out candy and he did a little quiz and so I thought that was great and I came up with questions on day two, so I don't feel like sitting up here and doing a boring recap of yesterday, so how about can you tell me, da, da, da So these people, I can do that, and I threw out a piece of candy... they were fighting to get the question then. Yeah, that was a good icebreaker. Yeah people like candy.</p> <p>[--The following is the perspective of U2 regarding the candy--]</p> <p>U2- That's the kind of stuff that just drove me nuts with those things. And when you have to sit there for three days, folks guess what? My favorite one was when we answered the questions right they threw candy at us. That was our prize for getting the right answer – they threw candy at us - they're lucky I didn't throw anything else back...It's an insult to the mentality. Hey Suzanne, in your system training, did they throw candy at you? [Suzanne: "Yeah."] See that was their rah-rah thing. [Suzanne: "And you're like 'Dude, get that candy out of my face.'"]</p>

	U20- we probably started the training a little bit late, training's an interesting issue because we trained people before hand and that might minimized you know user, that might fostered user acceptance a little bit better, but the issue was if you train them too far in advance and they don't start the project until here then they kind of forget what they've done.
Incentives [Positive comments]	F1(2)- they had to raffle off minicoopers[car] and so everyone who submitted their timesheets correctly three times in a row were automatically submitted to this raffle for a car.
	U20- I don't know for a fact, but I think that some of the colleges and departments did provide some financial incentives to people and I think they sent them to training.
	U19- we tried to take a look at the volume of transactions that they were processing and then tried to give them some financial reward and some recognition for the new skill sets that they had developed and things of that nature. But, it was something that we did with our own resources within our own college that wasn't done necessarily in other colleges
	U3- [As a trainer] Incentives? Yeah, It kind of worked out. Yeah, I think we got \$300 a class. So for every class I taught I got a \$300 bonus. And I sat there and I looked at the hours I spent and I said I think I made \$10 an hour over a period of time. Well, it was a lot of work and I gotta say I was pleasantly surprised at the university community... If you're not a self-motivated person, you're just not going to do it. There's just no pay for performance, good job, bad job or whatever you were getting your 2% increase. This year was the first time there was a pay for performance.
Incentives [Negative comments]	U21- I don't believe there were any incentives.
	U2- [Were there any incentives put in place for you?] Not a thing. Here's the work – do it.
Clear Consistent Plan [Positive comments]	U17- [the V.P., said] we're doing this - period, get on board, regardless of consequences, regardless of, we're doing it period... Figure it out.
	U11-[[Management consistency]] I think the goals remained pretty much the same. They would maybe shift a little bit and maybe delay, have to push a date somewhat, but pretty much remained.
Clear Consistent Plan [Negative comments]	U8-there was no planning ahead as to what our strategies were going to be. So one moment it's this, then depending on some meeting they attended, something they read, all of a sudden our direction went this way. So it wasn't and I certainly think that you can make changes along the way, but you're talking going from, you're heading down path A and all of sudden they want you to jump to path Z.

	<p>U13- They were going to implement one version 7.4 I think, I forget now. And then six months into that they changed and decided to implement 7.8, which was available when they decided to go to 7.4, so we lost a whole bunch of stuff and a lot of testing time.</p> <p>U5- about 9-10 months before the go live date, they had determined that this version of the system that we were doing that they'd come out with a new version that was an online web based and at the last minute the university kind of made a decision to go with the web based one, as to the other one which was not really web based and that kind of threw things, not quite out of whack, but you know I think it got quite a few people, you know, not really upset, but concerned that we were planning on this and now all of a sudden they said we were doing this and now we're going to do this... it kind of threw people for a loop that we were going to make this quantum leap you know 9 months ahead of time to go from something that they'd worked about a year on.</p>
Management Expertise [Positive comments]	[although no comments were identified that directly pertained to the expertise of management, it was demonstrated through the positive comments regarding how management was implementing the system well.]
Management Expertise [Negative comments]	<p>U14- the higher level was saying to the masses, kick them in the buttock if they don't give you what you want, make them create this system the way you want and they were telling us, you can't change anything, you have to sell it and use it the way it is. How do you reconcile that. From my perspective our biggest enemies, OUR BIGGEST ENEMIES, are the VPs. They have never logged into this system, they have no idea what it means to use this system and they don't want to know. And they also, again, my opinion, only hear what they want to hear because they tell the lower level echelons this is what you're going to tell me and that's what you're going to get told.</p> <p>U19-the vision and view from executive management at that 60,000 foot level is very different from what it is at the grassroots ground level. Devil's in the details. And that couldn't be more true with these software implementations. And, there may have been a little lack of understanding on the part of executive management on exactly how many details need to be in place for this thing to work smoothly and maybe a little bit of lack of recognition on their part in terms of the talent</p> <p>U5- I think at certain levels the goals were very articulate. At the very high level. And when you get down to the unit level maybe there wasn't that real understanding ... They're just concerned about how's it gonna affect the work that I have to do. And so, you know, these high fluting' goals, they're really good for the right people, but for other people they're not.</p>
System	U8- We did not take and change our processes to fit what was now

Customizations [Positive comments]	going to be in the new system. We took and made the system change to fit the processes... There's quite a few customizations that were done.
System Customizations [Negative comments]	U14- Basically we were told because of difficulties with the Banner Oasis project that they did not want to modify this system, that we were to try to make changes in the university, to change our business practices to work with the system
	U8- [If there were more customizations for the individual departments rather than just the central unit,] I think ... there would have been more of a buy in to the system.
	U20- Our system vendor comes up with upgrades all the time. So we made the decision to implement the system vanilla, which means that the system worked a certain way and we really had to adjust our business process to agree to the way the system worked and you know people were used to doing things the way they wanted to do them

APPENDIX D: CODING SCHEME

Reasons for User Resistance

- IND: Individual Issue (for users)
 - UN: Uncertainty [User is unclear of the future] (Unknown future, potential threat, lack of clarity)
 - LI: Lack of Input [User's opinions are not considered] (The thoughts and opinions of users were not sought out)
 - LC: Loss of Control/Power [User loses control or loss of recognition as the expert] (levelled playing field, not the expert anymore)
 - SE: Self-Efficacy [perceived lack of capability] (lack of confidence, lack of computer skills/abilities)
- SYS: System Issue
 - TP: Technical Problems [Problems with the system] (Bugs in system, features that don't work right)
 - CO: Complexity [System is complicated to use] (Difficult to access, Poor user interface that lacks logic or is not intuitive)
- ORG: Organizational Issue
 - LE: Lack of Facilitating Environment [Organizational culture is not conducive to the change] (bureaucracy that is slow to change)
 - PC: Poor Communication [Communication to users is problematic] (lack of communication, users not hearing benefits of system, users not understanding why)
 - PT: Poor Training [Training does not meet organizational needs] (Lack of training, training seems to be a waste of time, incompetent trainers, timing of training, sufficiency of training)
- PRO: Process Issue
 - CJ: Changed Job/Job Skills [User's job or job skill requirements changes] (Revised job description, different job tasks, new skills, new way of thinking)
 - AW: Additional Workload [User is required to put forth additional effort] (extra work, more work to get same extra time)
 - LA: Lack of Fit [Process problem between the system and organizational structure] (problematic changes to processes, new processes not working as planned)

Resistant Behaviors

- OA: Overt-Active [clearly expressed behavior that takes action] (Refusal to use system, challenge system/plan at system, don't follow process, quit job/job change)
- CA: Covert-Active [minimally expressed behavior that takes action] (Use shadow system, try to use old system, avoid system use, enter in info inappropriately)
- OP: Overt-Passive [clearly expressed behavior that is inert] (Complaints, lower morale, defensive, turnover intention)
- CP: Covert-Passive [minimally expressed behavior that is inert] (Not motivated, less productive, impatient, not paying attention, procrastinate, don't want to learn)

Management Strategies to Minimize Resistance --- Include + or - when coding

- ECO: Effective Communication
 - TD: Top-down communication [Top management/implementation team communicating to users] (communicate the types of changes to occur, the benefits of the system, the goals and vision, the "whys", managers sharing information with subordinates)
 - LF: Listen to Feedback [Management listening and responding to the input of users] (distribute/collect questionnaires, address complaints)
- EES: Effective Education/Support
 - PH: Provide Help/Support [Management offering assistance to users] (availability of consultants or helpline, providing a support system to interface with the system)
 - UT: Useful Training [Train the users at an appropriate time in a way that is suitable for their needs] (Trainers with knowledge/communication skills, address the needs of trainees, appropriate time frame)
 - AI: Appropriate Incentives [Suitable motivators to users to learn and use the system] (incentives to take training and to do extra work)
- EDP: Effective Direction/Planning
 - CC: Clear Consistent Plan [Straightforward consistent strategies] (Clear direction, consistent management strategies, following through with plans || opposite: confusion, failure to carry out plans)
 - ME: Management Expertise [Management understanding of processes and system] (Decision makers understand system and processes, Decision Makers understand the details)
 - SC: System Customizations [Customize the system to the processes in place] (tailor system to fit user needs)

APPENDIX E: INTERVIEW SCRIPT

Interview Script

The interview script is the following questions although follow up questions will also be included based on these questions when appropriate.

Background of interviewee

- Please describe your involvement in the Enterprise System implementation, the amount of time you were involved in the project, and the name/type of system

Change

- What degree of change has the Enterprise system had on your job?
- To what extent were employees of your organization affected by changing jobs and responsibilities because of the system implementation?
- For you, what were the advantages and disadvantages of the project?
- What did you gain and lose because of the system implementation?

Resistance

- Describe the type or types of resistance that occurred during the implementation.
- Why do you think this resistance occurred?
- Do you think anything could have been done differently to reduce the level of resistance?
- How does the phase of implementation affect the level or type of resistance?
- Describe the conflict between management and users (what type of conflict, how was it resolved, etc.)
- What types of things, if any, attracted users to embrace the system and change?
- What was the nature of goal-setting? For example, did management set all goals near the beginning, or were some goals set, then change – was one option more conducive to resistance?

Management Strategies

- What strategies did management take in dealing with resistance?
- To what degree is the vision and plans of management clear to you?
- How consistent are the vision and plans of management in your organization?
- Did management appear to be committed to seeing this system implemented and used?
- How was the training?

Extra

- To what degree was there training in using the system and what are the strengths/weaknesses of the training?

APPENDIX F: Q-METHODOLOGY QUESTIONNAIRE

STUDY INFORMATION SHEET

The following information is being presented to help you decide whether or not you want to be a part of a minimal risk research study. Please read carefully. If you do not understand anything, ask the person in charge of the study.

Title of Study: Rethinking User Acceptance: An Examination of User Resistance in Mandatory Adoption of Enterprise Systems

Principal Investigator: Timothy Klaus

The purpose of this research study is to better understand user resistance in the implementation of an Enterprise (ERP) System.

Your participation will include completion of this questionnaire and will take approximately 15 minutes. You will not receive benefits from participating in this research and there are no known risks involved. Your privacy and research records will be kept confidential to the extent of the law. Authorized research personnel, employees of the Department of Health and Human Services and the USF Institutional Review Board, its staff, and others acting on behalf of USF, may inspect the records from this research project.

The results of this study may be published. However, the data obtained from you will be combined with data from other people in the publication. The published results will not include your name or any other information that would personally identify you. Your decision to participate in this study is completely voluntary. You are free to participate in this study or to withdraw at any time. If you have any questions after completing this study or would like to review the results of the study upon completion, please contact:

Tim Klaus – (813)974-6751 or tklaus@coba.usf.edu.

If you have questions regarding your rights as a person who is taking part in a research study, you may contact a member of the Division of Research Compliance of the University of South Florida at 813-974-5638.

You are guaranteed total anonymity. All information you provide will be used exclusively within the bounds of this study and nothing will be used to identify you. None of the information you provide will be shared with your employer, or any other person or entity. Participation in this study is voluntary, and will not adversely affect your job.

For the next two pages, you are asked to sort the sets of statements. Sort the items "from the outside in". Start with step 1 by selecting two statements that are the "Most Representative" of your experience during the system implementation. Next fill in the boxes for step 2 by entering the "Least Representative" statements. Continue by filling in the four boxes for both steps 3 and 4. Finally, fill in the five boxes for both steps 5 and 6. Please pay attention to make sure that you enter an item only **once**.

Rate which statements are representative of your experience during the system implementation

Step 1	→	Most Representative (2 items)							
Step 3	→	Representative (4 items)							
Step 5	→	Somewhat Representative (5 items)							
Step 6	→	Minimally Representative (5 items)							
Step 4	→	Slightly Representative (4 items)							
Step 2	→	Least Representative (2 items)							

#	Statements	#	Statements
1	I was not comfortable with the level of certainty regarding how the system would affect my future	16	My organization's internal environment is not conducive to changes brought about by the system
2	I did not have sufficient input into how the system implementation would occur	17	There was poor or problematic communication to me during the system implementation process
3	I lost control/recognition of my expertise	18	Training was poor
4	I refuse to use the system	19	I complain to others about the system
5	The system required capability/skills that I lacked	20	I am defensive because of the system
6	I try to hack at the system	21	I am demotivated by the system implementation
7	The use of the system required that my job or required job skills changed	22	I decrease my level of productivity in protest because of the system
8	I don't follow the system processes I was told to follow	23	I am impatient during the system training
9	I intentionally perform my job in a different way than I'm supposed to in protest	24	I quit my job or changed to a different position at my job because of the system
10	I try to do my job the old way	25	I do not want to learn the system
11	I avoid using the new system whenever I can	26	I intend to quit my job, but never took action on it
12	I inappropriately enter information into the system	27	The system seemed complicated to use
13	I had to put forth additional effort because of the system	28	I procrastinate when I can
14	I experienced technical problems with the system	29	There were problems with the new processes that were put in place because of the system
15	I challenge the system implementation plan		

Please double-check to make sure that the items you entered have only been entered **once** and that all boxes are filled.

For the following two questions, please answer each question with a *minimum* of two sentences:

Why did you choose the two "Most Representative" statements? [space provided to answer question in actual questionnaire]

Why did you choose the two "Least Representative" statements? [space provided to answer question in actual questionnaire]

Rate the following statements regarding how much you would have desired the following management strategies in the system implementation

Step 1	→	Most Desirable (1 item)		
Step 3	→	Desirable (2 items)		
Step 4	→	Slightly desirable (2 items)		
Step 2	→	Least desirable (1 item)		

#	Statements	Examples
1	Top management/ implementation team communicates to users	Communicating the types of changes to occur, the benefits of the system, the goals and vision, the “whys”, managers sharing information with subordinates
2	Management listens and responds to the input of users	Distribute/collect questionnaires, address complaints
3	Management offers assistance to users	Availability of consultants or helpline, providing a support system to interface with the system
4	Users are trained in a way that is suitable for their needs	Trainers with knowledge/communication skills, address the needs of trainees, appropriate time frame
5	Suitable motivators are offered to users to learn and use the system	Incentives to take training and to do extra work
6	There is a clear and consistent implementation plan	Clear direction, consistent management strategies, following through with plans
7	Management understands the work processes and the system	Decision makers understand system and processes, Decision Makers understand the details
8	The system is customized to the processes in place	Tailor the system to fit the users’ preferences/needs

Why did you choose the “Most Desirable” and “Least Desirable” statements?

Thank you! Your participation is greatly appreciated.
Please take a moment to make sure you have answered all questions.

Do you wish to receive a copy of the results of this study?
If so, please provide your email address below or send an email to tklaus@coba.usf.edu to request a copy:

Email: _____

Please return the completed form to:
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APPENDIX G: SAMPLE OF CONSISTENT/INCONSISTENT CODING

* Names and other identifying information have been changed from these quotes

Table G-1: Examples of Consistent Coding – Reasons for Resistance

Quote #	Quote	Reason for Resistance
1	G6-those staff working in these sections are showing some resistance because they have fear they might loose their job	Uncertainty
2	G1-instead of spending a lot of time in terms of entries and all that, things will be captured, probably more time will be spent in terms of analysis, review things and sort of better improve things	Job/Job Skills Change
3	G2- maybe they are not so comfortable, the uncertainty of what's lying ahead.	Uncertainty
4	N3- instead of having to go to two pages to enter a purchase order, in the new system, they'd have to go to like four different screens to capture all the information they had to capture. So in that respect it's taking longer to do data entry.	Workload
5	N2-a lot of the reports that we're spitting out like journal entries that we prepare, there's was data that was not on them or the formatting was rather awkward and then it was very messy.	Technical Problems
6	N2-[the training] was really kind of just a waste of time and it was well after we had already started closing our first month anyways.	Training
7	N3- a lot of key users probably felt like their input was not solicited.	Input

Table G-2: Example of Inconsistent Coding – Reasons for Resistance

Quote #	Quote	Coder1	Coder2
1	G6-the main fear for them is that there will be reduction in manpower.	Uncertainty	Control/Power
2	G2-I think it's because you're threatening their comfort zone ... will I be able to do my job in the future or is it going to be very complicated	Uncertainty	Self-Efficacy
3	N3-Some of their jobs actually became more complex	Job/Job Skills Change	System Complexity
4	N3- People are uncomfortable when their jobs change and have to learn new tools, etc.	Job/Job Skills Change	Self-Efficacy
5	N3- I think there might have been an impression that we were going to gain there, but it actually became less efficient.	Workload	Technical Problems
6	N2-teams discussed, well, do we really need it and how are they going to get it for us and in a lot of cases it turns into a customization. There's custom reports that they have to build, which we actually just this week finally got the custom report we requested a year ago or over a year ago to work. So, it took awhile	Facilitating Environment	Management Strategy – System Customizations
7	N2-[there were issues such as] response time, lag time, really slow, very very slow,	Technical Problems	Workload
8	N4- That was the biggest change when this happened. I know how to do this in with another vendor's software, but now I don't know how to do it with our new vendor's software.	Self-Efficacy	Control/Power

Table G-3: Example of Consistent Coding –Resistance Behavior

Quote #	Quote	Resistance Behavior
1	G6-They take a month to do the process when this information can be provided within two hours.	Covert-Passive
2	G2-[What types of resistance was there?] Mostly complaints.	Overt-Passive
3	N3-[There were] lots of tickets late in the system when it wasn't really an error with the system, it was just not following the new process	Overt-Active
4	N3-I would say it was almost a level below middle management where it was the worker bees complaining how things didn't work.	Overt-Passive
5	N1- What type of behaviors? In some cases they would revert to their old way of doing things	Covert-Active
6	People went back to the old school and still tried to do things the way they did before	Covert-Active

Example of Inconsistent Coding – Resistance Behavior

None found – Coders consistently coded every resistant behavior.

Table G-4: Example of Consistent Coding – Management Strategy to Minimize Resistance

Quote #	Quote	Management Strategy
1	G7-The only thing that I remember we have done is just customize some of the reports	System Customization
2	G1-[have the vision and plans been pretty consistent over time or they have changed during the re-engineering of the processes?] This time it has been consistent, the way I've seen it, it has been consistent, yes.	Clear Consistent Plan
3	G6-everybody in the company knows what we are doing and why we are doing this.	Top-Down Communication
4	N3- We had to customize quite a bit, yes, for it to do everything that we needed it to do.	System Customization
5	N3- we had quite a few super users out in the field into specific locations and to assist the users when they had issues in the system and in effect they helped them resolve it.	Provide Help/Support
6	N3- There should have been more incentive to take the training.	Incentives
7	G3-[so you will essentially be the expert of your area and train everyone who is going to be using that module?] True. True.	Management Expertise

Table G-5: Example of Inconsistent Coding – Management Strategy to Minimize Resistance

Quote #	Quote	Coder1	Coder2
1	once we've completed the phase where we've designed the system and we've got an environment where we can actually be testing, test all the processes and so forth. At that time, you know, we'll be contacting every training positions for all the end user community.	Training	Top-Down Communication
2	I think 18 to 24 months would have been a much more realistic time frame. It would not have been necessarily cost more it just would have spread out more so people had more time to review and provide feedback to the system	Listen to Feedback	Training
3	N3-[Was the training optional then?] It was and it probably should have been required.	Training	Reason for resistance – training
4	N1- At one point, right before we went live, we had a lock down of customizations ... when you have to make your case [for customizations] in front of the CIO, corporate control - you'd better have a pretty strong case.	System Customizations	Listen to Feedback
5	N2-[was it the customizations that they put in that made it hard?] Yes, the rules and the customizations and the way they wanted things built.	System Customizations	Reason for resistance – Lack of Fit

APPENDIX H: CONCOURSE STATEMENTS

Table H-1: Concourse Statements for Reasons for User Resistance

Reason for User Resistance	Concourse Statement
Uncertainty	I was not comfortable with the level of certainty regarding how the system would affect my future
Lack of Input	I did not have sufficient input into how the system implementation would occur
Loss of Control/Power	I lost control/recognition of my expertise
Self-Efficacy	The system required capability/skills that I lacked
Technical Problems	I experienced technical problems with the system
Complexity	The system seemed complicated to use
Lack of Facilitating Environment	My organization's internal environment is not conducive to changes brought about by the system
Poor Communication	There was poor or problematic communication to me regarding the system implementation
Poor Training	Training was poor
Changed Job/Job Skills	The use of the system required that my job or required job skills changed
Additional Workload	I had to put forth additional effort because of the system
Lack of Fit	There were problems with the new processes that were put in place because of the system

Table H-2: Concourse Statements for Resistance Behaviors

Behavior Type	Concourse Statement
Refusal to use system	I refuse to use the system
Challenge system/plan	I challenge the system implementation plan
Hack at system	I try to hack at the system
Don't follow process	I don't follow the system processes I was told to follow
Quit job/job change	I quit my job or changed to a different position at my job because of the system
Use shadow system	I intentionally perform my job in a different way than I'm supposed to in protest
Try to use old system	I try to do my job the old way
Avoid system use	I avoid using the new system whenever I can
Enter in info inappropriately	I inappropriately enter information into the system
Complaints	I complain to others about the system
Defensive	I am defensive because of the system
Turnover Intention	I intend to quit my job, but never took action on it
Not Motivated	I am demotivated by the system implementation
Less Productive	I decrease my level of productivity in protest because of the system
Impatient	I am impatient during the system training
Procrastinate	I procrastinate when I can
Don't want to learn	I do not want to learn the system

Table H-3: Concourse Statements for Management Strategies

Management Strategy	Concourse Statement
Top-down communication	Top management/ implementation team communicates to users
Listen to Feedback	Management listens and responds to the input of users
Provide Help/Support	Management offers assistance to users
Useful Training	Users are trained in a way that is suitable for their needs
Appropriate Incentives	Suitable motivators are offered to users to learn and use the system
Clear Consistent Plan	There is a clear and consistent implementation plan
Management Expertise	Management understands the work processes and the system
System Customizations	The system is customized to the processes in place

APPENDIX I: QUOTES FROM QUESTIONNAIRE FOR EACH GROUP

Table I-1: Quotes from Questionnaire Respondents

Group	Questionnaire#	Quote
1	36	My knowledge base was taken away, system that was in place we had for years...To implement a new system, the decisions makers need to understand what the system does and what we need the system to do.
	61	I tried to be optimistic about the use of the system. I thought it would have been better for the use of the company in the long run...MGMT must not only listen to input but must respond and act.
	71	Must have user input to be successful.
	150	We are afraid of all changes...The way of working is difficult to change...the usage is easier if you have a clear implementation plan.
	161	The implementation was rushed and not effectively communicated within the organization, when questions were asked; they were not addressed.
	177	Without a clear and strong implementation plant the project will fail. I think people are either motivated or not. Incentives are short term fix for people.
2	109	One reason for resistance is the lack of good training.
	133	I had to change the way in which I was organized in order to attend to the important issues. Most of the people at the company have been around and fear changes.
	133	Because we implemented first and looked at the processes later this complicated things and were caused by not knowing things.
	140	There is a strong resistance to change for fear of learning new and more efficient methods.
	140	Good planning marks the Institution's future on educational and managerial levels, and it improves service. Success depends on mentality changes from the top.
3	70	We still have problems that have not been solved, that the new system is not designed for...The advantages were apparent and instead of rejecting the change we tried to cooperate with the transition.
	101	It is a hard system if you are not trained and additional training was needed...Everyone needed more training...Not all systems used in the plant would communicate with the new system.
	116	I only received 1.5 hours of training ... for a total of 6 days in class.

	119	It seemed complicated at first, more effort was expended at figuring out the new processes.
	152	The system was new and unknown, not sure what the future would hold.
	171	No clear directions on processes and technical process...I believe management should listen to the users, since they are using the system everyday. I don't believe in motivators to help the user learn the system.
	182	Need to know how to do job; not why.
4	87	I had not needed financials in the old system - I had to put forth effort in this one...Planning is critical to the success.
	93	During the implementation process, I witnessed confusion & chaos...My excitement of learning this new process diminished when I saw poor management.
	110	A clear project management plan helps to keep things moving.
	138	We had to change policies and processes which had been in use for many years.
	139	We have had technical problems due to poor infrastructure...A consistent plan everyone involved knows is important so we all go towards the same goal.
	155	there were issues with the new system - had they communicated properly to the implementation team, they could have been resolved.
	165	It required extra work to define requirements, learn processes, & report issues... system basics required to process changes...implementation plan being understood is critical to success & acceptance by users. - should not have to offer incentives if system improves things.
5	42	System is complicated and requires a good deal work to accomplish the same purpose.
	42	I never intended to quit due to the system - I was somewhat perturbed...If management understood the system better there would be less redundancy and the system would work better.
	47	I think there should have been some incentive to acquire the knowledge, management fails to comprehend the amount of time we had to spend away from our jobs.
	68	Customizing the system to fit the users is of course the most desirable.
	82	The implementation was difficult but I never thought of changing it... There needs to be some type of motivation [for] using the system.

	115	The system changed the way our university did business. It took 4 times the steps to do the same processes.
	147	It was difficult to change our working habits and did not know if it would affect my job...I would have liked my boss to understand the system and avoid misunderstandings.
6	120	[I] had to learn additional skills ... there were problems which I did not understand.
	143	We have had to adapt because the system has not been tailor made, we have had technical problems when running some of the processes.
	143	We did not have communication at all levels of the organization... I believe there was a plan.
	173	My position changed from having very little to do with the computer with having more.
	173	There was only incentives for those directly involved with the implementation - not for everyone else. Had to change our whole system to match the program.
7	62	[A] clear implementation plan needs to meet expectations.
	65	I was unfamiliar with the system. On initial use of the system it did not function...[I placed] technical support calls to fix the problem.
	65	Tailoring the system is necessary to complete the job. Motivators are just fluff, you are either motivated or you are not.
	81	The system was intense and overwhelming at the start.
8	49	The new process is more cumbersome than the old and requires learning more processes for the new system...I don't feel Mgmt. understood the work process.
	55	The new system is complicated, and is stressful - additional training is needed.
	84	The system was new to me and had lots of technical problems. [I] had to put forth more effort in learning this system...a system that is not catered to your company's needs ... is useless.
	122	We had a lot of technical problems system ... We had a trainer but her knowledge of what we did and why was not good. We needed to know where our information was going and how to extract it.
	154	Our skill set changed and there was no recognition of past experience.
	180	I had to play around with it to find how to do things, and read a 500 word page manual for each function...Motivators do not work with a poor system.

APPENDIX J: DEMOGRAPHICS OF QUESTIONNAIRE RESPONDENTS

Table J-1: Gender

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	58	38.2	38.4	38.4
	Female	93	61.2	61.6	100.0
	Total	151	99.3	100.0	
Missing	System	1	.7		
Total		152	100.0		

Table J-2: Education

Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High School	27	17.8	18.0	18.0
	Associate's Degree	17	11.2	11.3	29.3
	Bachelor's Degree	66	43.4	44.0	73.3
	Master's Degree	36	23.7	24.0	97.3
	Doctoral Degree	4	2.6	2.7	100.0
	Total	150	98.7	100.0	
Missing	System	2	1.3		
Total		152	100.0		

Table J-3: Age

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under 25	1	.7	.7	.7
	26-35	21	13.8	15.6	16.3
	36-45	39	25.7	28.9	45.2
	46-55	50	32.9	37.0	82.2
	Above 55	24	15.8	17.8	100.0
	Total	135	88.8	100.0	
Missing	System	17	11.2		
Total		152	100.0		

Table J-4: Position

		Position			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Clerical/Data Entry	8	5.3	6.0	6.0
	Support Staff	43	28.3	32.1	38.1
	IT Staff	11	7.2	8.2	46.3
	Supervisor	13	8.6	9.7	56.0
	Mid-level Manager	55	36.2	41.0	97.0
	Top Management	4	2.6	3.0	100.0
	Total	134	88.2	100.0	
Missing	System	18	11.8		
Total		152	100.0		

Table J-5: Employees in Organization

		Employees in Organization			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under 50	19	12.5	12.8	12.8
	50 to 100	4	2.6	2.7	15.4
	101-500	32	21.1	21.5	36.9
	501-1000	19	12.5	12.8	49.7
	1001-5000	49	32.2	32.9	82.6
	Over 5000	26	17.1	17.4	100.0
	Total	149	98.0	100.0	
Missing	System	3	2.0		
Total		152	100.0		

Table J-6: Industry of Employer

Organization's Industry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Government	1	.7	.7	.7
	Manufacturing	22	14.5	14.6	15.2
	Healthcare	2	1.3	1.3	16.6
	Retail	2	1.3	1.3	17.9
	Education	105	69.1	69.5	87.4
	High-tech	10	6.6	6.6	94.0
	Other	9	5.9	6.0	100.0
	Total	151	99.3	100.0	
Missing	System	1	.7		
Total		152	100.0		

Table J-7: Scope of Organization's System

Scope of System

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	One location	31	20.4	21.2	21.2
	Regional	46	30.3	31.5	52.7
	National	33	21.7	22.6	75.3
	Global	36	23.7	24.7	100.0
	Total	146	96.1	100.0	
Missing	System	6	3.9		
Total		152	100.0		

Table J-8: System Vendor

System Vendor

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SAP	4	2.6	2.7	2.7
	Peoplesoft/Oracle	131	86.2	87.3	90.0
	J.D. Edwards	9	5.9	6.0	96.0
	Don't Know	2	1.3	1.3	97.3
	Other	4	2.6	2.7	100.0
	Total	150	98.7	100.0	
Missing	System	2	1.3		
Total		152	100.0		

Table J-9: Statistics for Numeric Demographics

Statistics

		Years in Current Position	Years in the Organization	Days in Training	Days between finishing training and using live system
N	Valid	147	147	138	131
	Missing	5	5	14	21
Mean		5.64	10.58	14.667	55.10
Median		5.00	8.50	5.000	7.00
Std. Deviation		4.761	7.699	26.5729	132.038
Minimum		0	1	.0	0
Maximum		30	34	180.0	730

Table J-10: ES Modules Used by Respondents

		Frequency	Percent	Valid Percent
Purchasing	Did not use module	84	55.3	56.0
	Used module	66	43.4	44.0
	Total	150	98.7	100.0
	Missing	2	1.3	
	Total	152	100.0	
Production	Did not use module	113	74.3	75.3
	Used module	37	24.3	24.7
	Total	150	98.7	100.0
	Missing	2	1.3	
	Total	152	100.0	
Finance	Did not use module	85	55.9	57.0
	Used module	64	42.1	43.0
	Total	149	98.0	100.0
	Missing	3	2.0	
	Total	152	100.0	
Receiving	Did not use module	104	68.4	69.3
	Used module	46	30.3	30.7
	Total	150	98.7	100.0
	Missing	2	1.3	
	Total	152	100.0	
Customer Management	Did not use module	113	74.3	75.8
	Used module	36	23.7	24.2
	Total	149	98.0	100.0
	Missing	3	2.0	
	Total	152	100.0	
Billing	Did not use module	122	80.3	81.3
	Used module	28	18.4	18.7
	Total	150	98.7	100.0
	Missing	2	1.3	
	Total	152	100.0	
Maintenance	Did not use module	135	88.8	90.0
	Used module	15	9.9	10.0
	Total	150	98.7	100.0
	Missing	2	1.3	
	Total	152	100.0	
Human Resource	Did not use module	99	65.1	66.9
	Used module	49	32.2	33.1
	Total	148	97.4	100.0
	Missing	4	2.6	
	Total	152	100.0	
Inventory	Did not use module	116	76.3	77.9
	Used module	33	21.7	22.1
	Total	149	98.0	100.0
	Missing	3	2.0	
	Total	152	100.0	

B2B Commerce	Did not use module	146	96.1	98.0
	Used module	3	2.0	2.0
	Total	149	98.0	100.0
	Missing	3	2.0	
	Total	152	100.0	
Shipping/ Distribution	Did not use module	126	82.9	84.0
	Used module	24	15.8	16.0
	Total	150	98.7	100.0
	Missing	2	1.3	
	Total	152	100.0	
Other	Did not use module	86	56.6	57.7
	Used module	63	41.4	42.3
	Total	149	98.0	100.0
	Missing	3	2.0	
	Total	152	100.0	

ABOUT THE AUTHOR

Timothy Paul Klaus is currently an Assistant Professor of Management Information Systems at Texas A&M University – Corpus Christi. He received a Master of Business Administration degree and Master of Science Degree in Computer Science from Illinois State University. While completing his second Master's Degree, he conducted seminars for businesses on Entrepreneurship, Business Plan Development, and Business Growth Strategies and has been a consultant to several organizations. His current research interests are in User Resistance, IT Personnel, and Global IT Systems.

After living the first 18 years of his life in Japan, he moved to the U.S. to start his college career. His undergraduate degrees are in International Business and Organizational Leadership with a minor in Japanese Studies. He has enjoyed traveling and meeting people from various cultures. After getting married, his wife often travels with him and has seen much more of the world than she ever thought...