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The influence of organizational and information systems factors on the effectiveness of post-merger technology integration

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ABSTRACT

THE INFLUENCE OF ORGANIZATIONAL AND INFORMATION SYSTEMS FACTORS ON THE EFFECTIVENESS OF POST-MERGER TECHNOLOGY INTEGRATION

by
Gianilda A. Morsell

This dissertation explores how ten specific organizational and information systems factors influence post-merger IS integration success, and the role that degree of IS integration plays in moderating the influence these factors may have on IS integration success. Data were gathered, using a self-administered survey instrument, from senior IS executives at firms that experienced a U.S. public merger greater than $25 million between 2004 and 2007. Support is found for the study's Conceptual Model, indicating that all ten factors in unison influence post-merger IS integration success. The data support the hypotheses that quality of merger planning, quality of communication of merger activities to IS, quality of IS integration planning, degree of end-user involvement in IS integration activities, and quality of technical support to users during the IS integration each have a significant influence on post-merger IS integration success. The data also support the moderating effect of degree of IS integration on the relationship between post-merger IS integration success and executive (non-IS) management support. In a supplemental path model analysis, a complex relationship is hypothesized to exist between the factors and IS Capability and IS Performance, the two IS integration success measures. As a result, four of the five remaining hypotheses are indirectly supported. This research expands the body of knowledge that identifies sources of IS integration performance, thus helping to explain sources of overall merger performance.

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by
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THE INFLUENCE OF ORGANIZATIONAL AND INFORMATION SYSTEMS FACTORS ON THE EFFECTIVENESS OF POST-MERGER TECHNOLOGY INTEGRATION

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To the United States of America, for the freedoms and boundless opportunities it offers those willing to work towards achieving their dreams.

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This dissertation is especially dedicated to the memory of my father, Joseph Baro, my grandfather, Guarionex Alcántara, and my friend, Nuni Regús. My father inspired me to pursue a Ph.D. and told me that with a Ph.D. I would be able to create and test my own theories. I was skeptical at the time. However, I believe that this dissertation is testament to what my father said, and I hope it is the beginning of a bright future in academic research. They were remarkable people who inspired me to believe in myself and to always give and do my best across all aspects of life.

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CHAPTER 1

INTRODUCTION

1.1 Objective

The purpose of this empirical research is to investigate the role that ten particular factors play in predicting the success of post-merger information systems (IS) integration between two companies. Specifically, this study looks at four organizational and six information system factors controllable by leadership teams. It also considers the effect of degree of IS integration as a moderator in the relationship between these ten factors and IS integration success.

This chapter briefly introduces mergers, some of the main drivers behind mergers, their prevalence in the corporate environment, and some of the reasons for their poor performance. It also introduces the concepts of systems integration, post-merger IS integration success, and the ten factors on which this study focuses. The chapter concludes by identifying key contributions and motives behind this research topic.

1.2 Background

Every year, thousands of companies, large and small, public and private, join forces through a merger or acquisition (M&A), hoping to accomplish together what they could not accomplish separately (Lajoux, 2006). The term *M&A integration* refers primarily to the art of combining two or more companies after they have come under common ownership. *M&A* refers to the merger or acquisition transaction that leads to the combination, and *integration*

refers to the combining of elements that will enable the two companies to function as one (Lajoux, 2006). Post-merger IS integration refers to the combining of IS components that will enable the two companies to function as one. The term *merger* is used generally for any acquisition consummated with a plan for integration of significant resources, regardless of the nature of the transaction, whether merger or acquisition, although these two are technically different. Technically, an acquisition describes the transfer of ownership, and a merger describes a transfer of ownership in which one entity legally disappears into the other, or both entities disappear into a third entity created for the purpose of the merger (Lajoux, 2006). Merger integration can involve entities other than companies (for example, nonprofit organizations and governmental organizations) and transactions other than mergers or acquisitions (such as, divestitures, joint-ventures, strategic alliances) (Lajoux, 2006). However, this study's emphasis is on standard mergers and acquisitions involving two companies, without making any assumptions about the effectiveness of mergers versus any other types of transactions (e.g., divestitures, joint-ventures, strategic alliances). Identifying controllable factors that influence the success of a post-merger IS integration between two companies is the main topic of this research.

Historically, M&As have been a primary tool of corporate strategy (Sirower 2003). Mergers have many motives or drivers, including horizontal and vertical integration, market power gains, efficiency gains, geographic expansion, resource sharing, empire building, and diversification (Steiner, 1975; Trautwein, 1990). The desire to obtain valuable resources, including technologies, know-how, and capabilities has also driven merger activity (Chaudhuri, Tabrizi, 1999; Ahuja, Katila, 2001).

Mergers occur in waves (Golbe, White, 1993; Mueller, 1989), and these waves tend to be positively correlated with stock market prices (Nelson, 1959, 1966; Melicher, et al., 1983; Geroski, 1984). For example, compared with the blitz of deals announced between 1998 and 2000, merger activity declined sharply between 2000 and 2003. But while only $441 billion of deals where done in 2002, or less than a third of the record setting $1.3 trillion in 1999 and 2000, M&A activity in 2004 was close to $700 billion, and was expected to grow approximately 20% in 2005 (Giera, 2004). Chapter 1, Figure 1 illustrates total U.S. mergers by year, from 1994 through 2006, and the upturn of activity since 2002. After the wave of downsizing and cutbacks that occurred after September 11, 2001—during 2002 and into early 2003—M&A activity steadily increased through the end of 2005, rivaling the pace of transactions before 9/11 (Galpin, Herndon, 2007). Popular merger examples include AOL/Time Warner (Meeks, 2000) in the media industry, WorldCom/MCI in the telecommunication sector, Pfizer Inc./Pharmacia Corp in the pharmaceutical industry (Roberts, 2002), and Citicorp/Travelers Group (Loomis, 1999) in finance.

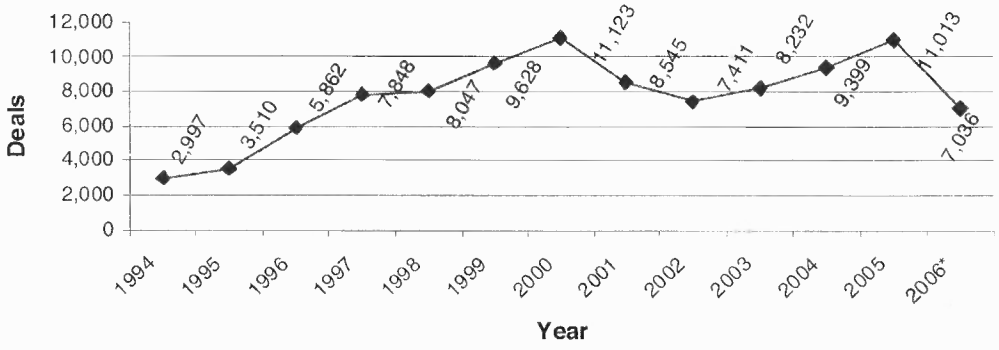

Figure 1.1 Total U.S. mergers by year: 1994 – 2006 (* August 20, 2006).
Source: FactSet Mergerstat, Giera (2004), Galpin & Herndon (2007)

But despite their popularity, many mergers have been unsuccessful, suggesting that they are generally not well understood in practice (Jemison, 1988; Hitt et al., 1991; Porter, 1985). Success refers to the ability to reach the intended goals of the merger, based on the merger motives. A merger is also considered successful if it achieves the synergies it promised at the time of the announcement of the deal, and its share price and revenue growth rate increases post-merger (Mehta, Hirschheim, 2004). A 1987 McKinsey & Co. study of 116 acquisitions shows that at least 61% failed to earn back equity capital invested within three years of the merger. Others believe that anywhere from 65% to 80% of mergers never deliver a real return on investment (Worthen, 2007). The lack of good merger performance indicates that much research is still needed in this area to help us understand what factors affect the success of a merger.

Among primary causes for merger failure cited by the literature are slow, poor, or lack of post merger integrations between merged firms (Lajoux, Weston, 1998; Worthen, 2007; Kitching, 1967; Ranft, Lord, 2002; Shrivastava, 1986), including the integration of operations (Haspeslagh, Jeminson, 1987; Popovich, 2001), and implementation difficulties (Ravenscraft, Scherer, 1989). Information systems play a big role in the integration of two companies, as they are used to support critical daily business processes. A slow integration delays achieving the financial or resourced-based gains that might have made the deal attractive initially (Worthen, 2007). The longer it takes to achieve the post-merger integration, including the IS integration, the less profitable the merger becomes. Another cited cause of merger failure is paying premiums of 10% to 15% above market value for the target firm (Worthen, 2007).

In the context of a single company, systems integration can be defined as the unification of information systems and databases to improve the process flow and focus on customer services (Markus, 2000). Many organizations manage and maintain a diverse portfolio of IS and applications (Lam, 2005). The integration of these applications is often necessary to support broader enterprise-wide business solutions, such as supply chain management (SCM), customer relationship management (CRM), and enterprise resource planning (ERP). Enterprise application integration (EAI) is one approach to IS application integration (Lam, 2005). Web Services are a set of common technology standards being adopted by the industry to make applications and data integrate and interoperate (Andriole, 2006).

In the context of mergers, systems are integrated so that business processes flow smoothly and information can be displayed in a unified way to support administrative and management decision making (adapted from Mendoza, et al., 2006). Using hardware, software, databases, telecommunications, human resources, and procedures, information systems transform data into information (Zwass, 1998). *IS integration success* refers to the ability to effectively integrate IS components as a result of a merger between two companies, where IS components refer to the infrastructure, processes, applications, people (skills) and culture that make up the information systems environment of the merging firms (Mehta, Hirschheim, 2004).

Some researchers have developed frameworks to classify different types of integrations (Shrivastava, 1986; Buono, Bowditch, 1989; Haspeslagh, Jeminson, 1991; Hambrick, Cannella, 1993; Schweizer, 2005). However, few researchers have specifically investigated how the IS functions of the two merging firms are integrated

(Mehta, Hirschheim, 2004). Giacomazzi et al. (1997) and Weber and Pliskin (1996) explored information technology (IT) integration levels and IT infrastructure strategies and the effect of organizational culture on mergers. Chin et al. (2004) proposed different IT governance arrangements for different types of acquisitions. Main and Short (1989) followed a seven-month planning process of the merger between American Hospital Supply and Baxter Healthcare Corp., focusing on the planning phase and not saying much about the post-merger integration process. Brown et al. (2003) provided details of the post-merger integration process between Sallie Mae and USA Group, at the time the two largest players in the education finance (student loan) industry. They identify several critical success factors and lessons learned along the way.

1.3 Introduction to the Factors

This research focuses particularly on four organizational and six IS factors that can be shaped and controlled by the IS leadership teams. Because these factors can be shaped or controlled, leadership teams focused on the most influential factors can facilitate an effective post-merger IS integration, impacting merger integration success, and ultimately impacting overall merger success. Although other factors have been found to be associated with post-merger IS integration success, they have been excluded from this study because leadership teams cannot directly control or manage how the factors are manifested in the post-merger environment. For example, this study excludes company merger experience (Haleblian, Finkelstein, 1999; Hitt, et al., 1993; Bruton, et al., 1989), similarity of merged firms' application portfolios (Brown, et al., 2003), and level of data sharing (Stylianou, et al., 1996).

After an in-depth review of the literature, each of the ten factors of focus in this study were selected based on their prominence across various information systems contexts, their relevance to a post-merger IS integration, and the ability of management teams to shape them. The origin of these factors and the literature that supports their inclusion in this study is further elaborated in Chapter 3 (Table, 3.1 encapsulates the supporting literature). The following paragraphs briefly introduce the factors and highlight a few reasons why they are important during an IS integration. The four organizational factors include: 1) executive (non-IS) management support for IS integration activities, 2) quality of merger planning, 3) quality of communication of merger activities to IS, and 4) degree of IS participation in merger planning.

Executive (non-IS) management support promotes commitment, provides sponsorship, hands on leadership and political support (Al-Mashari, Zairi, 1999; Wixon, Watson, 2001). It has been found to have a positive influence in the development of information systems (Jarvenpaa, Ives, 1991; Lee, 1986; Leitheiser, Wetherbe, 1986), data warehousing projects (Wixon, Watson, 2001), expert systems (Yoon, et al., 1995), implementation of IS innovations (Jarvenpaa, Ives, 1991; Kwon, Zmud, 1987; Leonard-Barton, Deschamps, 1988; Purvis et al., 2001), and integrations of computer-aided design/computer-aided manufacturing systems with resource planning systems (Soliman, et al., 2001). It has also been found significant in the context of runaways projects (Mahaney, Lederer, 1999), and in the context of IS integration leadership (Schweiger, et al., 1987; Brown, et al., 2003; Datta, 1991).

The *quality of merger planning* facilitates the identification of details critical to the merger deal's success (Haspeslagh, Jeminson, 1991; Aiello, Watkins, 2000), the

decision making process and communicating that structure to the merger firms (Massimilian, 2001), as well as the mitigation of merger failure risks, where risks are factors that can adversely affect a project, unless project managers take appropriate countermeasures (Wallace, Keil, 2004). Among the risks a quality merger plan helps to mitigate are people issues, culture clashes (Buono, et al., 1985), and intangible losses, namely losses associated with experience/memory, motivation, commitment, and competence found in people (Larsson, et al. 2001).

Similarly, the *quality of communication of merger activities to IS* facilitates collaboration between the business teams and the IS teams and aids these two groups in staying aligned (Reich, Benbasat, 2000; Rockart, et al., 1996; Lind, Zmud, 1991). Communication allows IS teams to understand and ultimately plan to meet the users' needs and integration expectations. The importance of quality communication is emphasized in the context of software projects success/failure factors (Glass, 1999), between developers and end-users (DeBrabander, Thiers, 1994), among process re-engineering implementations success/failure factors (Davenport, 1993), and within post-merger IS integration projects (Stylianou, et al. 1996; Robbins, Stylianou, 1999). Specifically, communication is considered one of the three most important factors in collaborative software development success, being both a risk source (origin for problems) or a risk driver (a manifestation of an existing problem) or both (Mohtashami, et al., 2006).

Degree of IS participation in merger planning is conducive to IS teams staying aligned with the business goals and having a better understanding of executive's objectives (Reich, Benbasat, 2000; Zmud, 1988; Lederer, Burky, 1988).

This study also focuses on six manageable and controllable IS factors: 1) quality of IS integration planning, 2) quality of communication of IS integration activities to user areas, 3) degree of end-user involvement in IS integration activities, 4) quality of technical support to users during the IS integration, 5) provisions for training due to the integration, and 6) provisions to address IS employee morale.

Quality of IS integration planning impacts when and how major IS resources, assets, processes and commitments of the merged firms will be combined to achieve the strategic objectives of the merger (Lajoux, 2006). A disciplined IS integration program based upon best practices and a solid plan that explains the motives for the merger is a solid place to start in order to capture maximum value (Vester, 2002). A quality IS integration plan can be used to set realistic integration expectations and to outline the strategic role that the IS teams will play in supporting the new organization (Bailey, 2001).

Quality of communication of IS integration activities to user areas helps generate understanding between the IS teams and user areas regarding the progress of merger activities, stimulates understanding and support from the end-user constituency (Robbins, Stylianou, 1999), and facilitates information sharing on comparative analysis of the relevant systems (Brown, et al., 2003). Communication between developer teams and end-users has been associated with success and failure of computer-based systems implementations (De Brabander, Thiers, 1984). Communication is also critical in the context of enterprise resource planning project implementations (Na, Delgado, 2006) and in the context of diffusion of innovations (Rogers, 1982; Thompson, 1965; Pierce, Delbecq, 1977).

Degree of end-user involvement in IS integration activities establishes the extent to which end-users partake in IS-related integration activities. End-user involvement leads to improved participative decision making and group problem solving. Among other benefits, user participation in systems development is predicted to provide more accurate and complete assessment of user information requirements (Norton, McFarland, 1975; Robey, Farrow, 1982), improve user understanding of the system (Lucas, 1974; Robey, Farrow, 1982), and lead to increased user acceptance (Lucas, 1974; Gibson, 1977; Keen, 1981; Robey, Farrow, 1982; Markus, 1983; Baroudi, et al., 1986; Newman, Sabherwal, 1996; Hunton, Beeler, 1997). In traditional software engineering disciplines, it is deemed key to avoiding software project failure (Jiang, et al., 2002), and key to success (Clavadetscher, 1998).

Quality of technical support to users during the IS integration may ultimately affect systems use (Fishbein, Ajzen, 1975), a key dependent variable in MIS research (DeLone, McLean, 1992). Sustained IS usage intentions may hinge on the efficacy of the local computer specialist group in providing technical support (Karahanna, et al., 1999). Technical support may also influence user information satisfaction, which has been accepted as a major evaluation criteria for the performance of IS departments and their staff (Joshi, Bostrom, 1986). MIS research has found that one of the most important factors influencing user information satisfaction is attitude towards IS staff and services, which includes items such as time taken for development of new systems, and relationships with IS staff (Joshi, Bostrom, 1986).

Provision for end-user training due to the integration helps users understand the software tools they require to perform their jobs, improving their education and computer

efficacy. Training has been linked to the success of end-user computing (EUC) satisfaction, and identified as a critical factor and an effective mechanism for ensuring EUC success (Dickson, et al., 1984; Zmud, Lind, 1985; Hartog, Herbert, 1986; Harrison, Rainer, 1992). Training may also help to enhance employee's self-efficacy, the belief that one has the capabilities to perform a particular behavior, and computer self-efficacy, the judgment of one's capability to use a technology (Compeau, Higgings, 1995). It also provides end-users with conceptual and procedural knowledge about the target system (Venkatesh, 1999), affects perceived ease of use (Venkatesh, Davis, 1996), and has a positive relationship with the acceptance of IT within an end-user environment (Cronan, Douglas, 1990).

The last information systems factor of focus in this study is *provisions to address IS employee morale*, which may play a significant role in employee departures throughout the merger. It may be addressed by focusing on controlling negative factors, such as anxiety, which can be minimized by communicating to employees, as soon as possible, affects of the changes as a result of the merger (Schweiger, Denisi, 1991). Anxiety can lead to job stress, job dissatisfaction, low commitment, low trust in organization and increased intentions to leave the organization (Ashford, et al.; Buono, et al., 1985; Marks, Mirvis, 1983; Robino, DeMeuse, 1985).

1.4 Degree of IS Integration and IS Integration Success

In addition to investigating how the ten aforementioned organizational and information systems factors influence post-merger IS integration success, this study will investigate the role that *degree of IS integration* plays in moderating the influence that the factors may have on post-merger IS integration success. In this study, the *degree of IS integration* refers to the extent to which the IS components between the merging firms are "actually" combined as a result of the merger. Chapter 2 discusses further the way in which, ultimately, the merger motives influence the IS integration strategies decision, which in turn partly determines how much or how little IS integration needs to occur between the merged firms. Based on that discussion, one can say that depending on the extent of IS integration required, the aforementioned factors could have more or less influence on IS integration success.

Finally, building on previous research (Stylianou et al., 1996; Robbins, Stylianou, 1999), this study examines IS integration success across multiple dimensions using a variety of validated measures, including *improved IS capability outcomes*, *IS contribution to the overall merger schedule and merger budget*, *IS a*bility to *exploit opportunities* and *avoid problems* arising from the M&A, and *IS resource utilization* (time, personnel, and financial resources) during the integration process.

1.5 Potential Contributions

The prevalence and ubiquitous nature of mergers as external diversification strategies and the need to further understand post-merger integrations in order to improve merger performance are two major motives behind this research. This research began with an in-depth review of the merger literature. Few analysts have examined the problems of integrating firms after the merger has been consummated and the impact of this lack of integration on performance (Chakrabarti, 1990). The dearth of empirical studies on the topic of post-merger IS integration and the connection that exists between a successful integration and effective merger performance substantiates the need for additional research in this area. Specifically in the context of a corporate landscape where information sharing and reliability on technology and information systems is high, research that increases our understanding of the factors that influence IS integration effectiveness is very valuable. As a key component of the overall firm integration and merger implementation, a deeper understanding of the manageable sources of IS integration success advances the field of study that investigates merger integration performance, aiding researchers and professionals in IS strategic planning and management information systems.

In addition to expanding the knowledge base regarding post-merger IS integration performance, this study contributes to the merger and IS field by identifying paths for future research on this topic (Chapter 7). In Chapter 2 and Chapter 7, the researcher identifies opportunities for future research, and in several instances preliminary work has been performed that can be used by future researchers (e.g., Chapter 2: Table 1, Table 2, Table 3, Table 4, and Figure 1; Chapter 7, Section 7.3 and Section 7.4).

This study contributes the Conceptual Model (Chapter 3, Figure 3) as a basis for future research. It also informs this model by consolidating the five IS integration measures into two and by proposing two hypothesized path models (Chapter 5, Figure 2 and Figure 3) that attempt to explain the complex relationship between the factors and their influence on IS Capability and IS performance.

1.6 Document Organization

The remainder of this dissertation is organized in the following manner. Chapter 2 summarizes merger research streams, highlighting how merger motives impact the IS integration strategies decision, and ultimately the post-merger degree of IS integration required. This chapter builds a foundation that partly corroborates the study's Conceptual Model (Chapter 3, Figure 3), which posits that the *degree of IS integration* moderates the relationship between the organizational and IS factors and IS integration success. Chapter 3 discusses previous research germane to post-merger integrations and IS success measures, providing background on the measures to be used in this study as the dependent variable, post-merger IS integration success. Chapter 3 also introduces the Conceptual Model and the research hypotheses derived from the model. Chapter 4 presents the methodology the study applied to collect the data and the process used to develop the survey instrument. Chapter 5 outlines the statistical data analyses performed on the data collected, along with the results of such analyses. Specifically, in the supplemental analysis section, Chapter 5, Section 7.1, two path models are created and tested. In Chapter 6, the study findings are discussed in detail and interpreted based on previous findings in the literature. Finally, Chapter 7 concludes with a summary of the

dissertation, highlighting key findings, limitations, areas for future research and implications for both the IS field and practitioners.

CHAPTER 2

LITERATURE REVIEW

A thorough review of the literature identifies key areas of merger research and highlights existing gaps in academic research efforts that address the post-merger IS integration performance. This chapter introduces merger motives to provide background on the motives' impact on the IS integration strategies, and ultimately the post-merger degree of IS integration required, which is the moderator variable in this study. A moderator variable is a "qualitative (e.g., sex, race, class) or quantitative (e.g., level of reward) variable that affects the direction and/or strength of the relation between an independent or predictor variable and a dependent or criterion variable" (Baron, Kenny, 1986). The chapter also discusses the merger lifecycle, outlining five specific phases and the types of activities that take place in each. It also reviews the role of the IS teams, represented by the senior IS executive, the Chief Information Officer (CIO), so that the reader may more easily identify how the activities associated with this role could be mapped to the phases of the merger lifecycle. This chapter also introduces some of the challenges faced by the IS teams, which are evidence of an existing gap between the role that the IS teams currently play throughout the merger lifecycle and the role which the literature prescribes that the IS teams *should* play in order to improve the performance of the post-merger IS integration and merger performance in general.

2.1 Merger Research Streams

Mergers are complex events in an organization's life (Larsson, Finkelstein, 1999) and a fact of organizational life in the U.S., with corporations investing billions of dollars each year in such ventures (Datta, 1991). Over the past several decades, M&As have become a well-institutionalized phenomenon in the structure and behavior of business organizations (Hirsch, 1986). In addition to the historic prevalence and anticipated future growth of mergers, individual firms often engage in merger activity multiple times (Haleblian, Finkelstein, 1999), making this research topic relevant and timely, as companies would benefit from learning ways to improve their ability to achieve IS merger integration success. To illustrate, during one six-year period in the 1990's, *Cisco Systems* spent $18.8 billion on 42 acquisitions, of primarily smaller firms with new technologies in various stages of development (Ranft, Lord, 2002). In 1999 alone, *Cisco Systems* made 18 acquisitions, and experienced an even higher rate of acquisitions in 2000 (Kaplan, 2001). Another example is *Microsoft*, which in the mid 1990s initiated a series of technology-driven acquisitions to keep pace with the rise of the Internet (Ranft and Lord, 2002). Similarly, *Intel* set aside roughly $8 billion in 2000 for acquisitions in new technologies and markets, twice the amount allocated to research and development (R&D) (Ranft, Lord, 2002). Finally, First Union Corp., a bank based in Charlotte, NC, has grown in assets from $7 billion to $220 billion since 1985 through a series of acquisitions, and saved up to $10 million a month by eliminating the data centers of CoreStates Financial Corp., a bank it acquired in 1999 (Giera 2004).

LTV Steel Corp. exemplifies a merger plagued with IS-specific implementation problems (O'Boyle, Russell, 1984). As a result of the merger between Republic Steel

Corp. and Jones & Laughlin Steel Corp in June of 1984, LTV Steel became the nation's second largest steel maker. After the merger, LTV Steel encountered many problems, some very IS-specific. One of the main problems was that the companies had duplicate systems for nearly every corporate activity, including order, employee benefits, payroll, accounting, and accounts receivable and payable, to name a few. In order to achieve the various expected synergies and projected cost savings, a combination of plants and personnel would be required, a process that LTV officials acknowledged could take up to five years to complete.

Mergers have been studied by academics from several disciplines and through various theoretical lenses (Schweizer, 2005). Schweizer (2005) provides a concise view of the merger literature. Despite the broad body of literature and the efforts to bridge the gap between existing merger research streams (Haspeslagh, Jeminson, 1991), a great deal of fragmentation still exists (Larsson, Finkelstein, 1999). In the field of strategic management, authors have been primarily concerned with the performance effects of different types of mergers (Lubatkin, 1983; Seth, 1990). Research in economics has focused on merger motives and performance (Goldberg, 1983, Steiner, 1975). The finance field has addressed whether mergers create value (Jensen, Ruback, 1983; Lubatkin, 1987). The human resources management literature on mergers (Ivancevich, et al., 1987) has identified psychological issues (Marks, Mirvis, 1986), the importance of effective communication (Schweiger, DeNisi, 1991), and M&A's effects on career and turnover (Hambrick, Canella, 1993). Organizational research has dealt with post-combination integration (Birkinshaw, et al., 2000); Haspeslagh, Jeminson, 1991; Shrivastava, 1986), emphasizing the problem of combining different organizational

cultures (Cartwright, Cooper, 1992; Larsson, Lubatkin, 2001). From this summary of various streams of merger research, it is evident that very little effort has been devoted to examining merger performance from the perspective of IS integration, making this research very relevant.

Appendix A is a compilation sampling of merger research across a number of merger topics: M&A impact on human resources, M&A motives and characteristics, M&A impact on organizational performance, M&A integrations, and M&As and information systems. Each study outlined in the appendix provides the author(s), the data collection period, the research methodology, the study goal, the dependent and independent variables, and the study's major findings and conclusions. In addition, Chapter 2, Figure 1 depicts a graphical summary of major merger research topics. The question marks indicate areas where academic research is scarce or non-existent and where the researcher recommends additional research efforts. The literary references will be discussed throughout the remainder of this proposal. Appendix A and Chapter 2, Figure 1 are two contributions of this research.

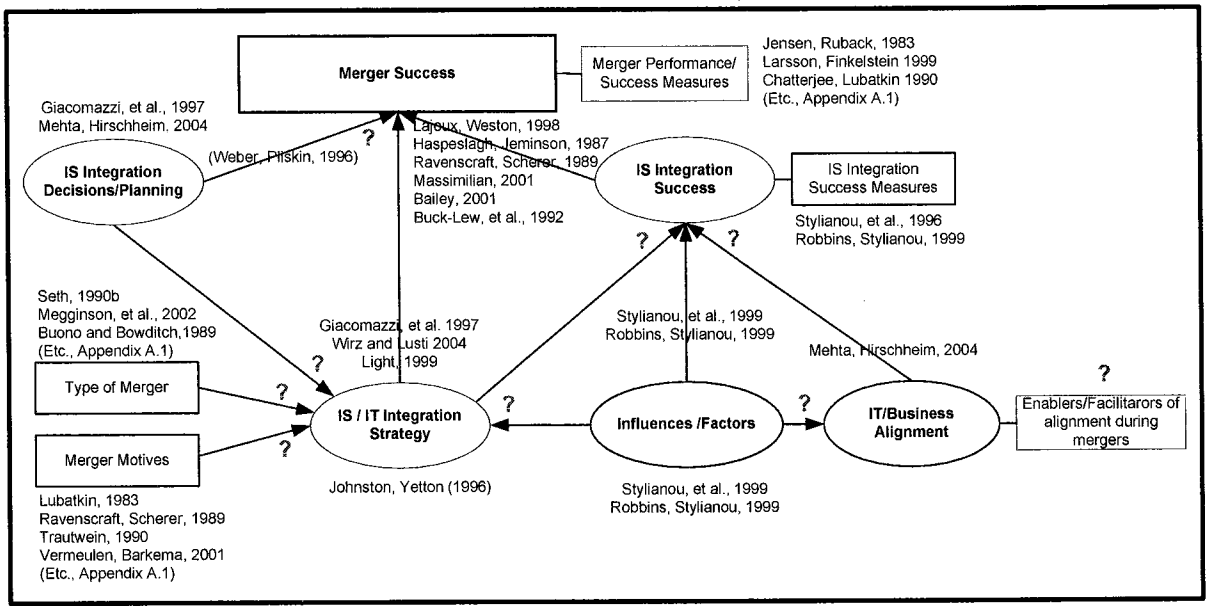

Figure 2.1 Summary of IS and merger research.

2.2 Merger Motives

This study posits that the merger motives influence the post-merger IS integration strategies selected, and ultimately the degree of IS integration required. It also claims that the degree of IS integration moderates the relationship between the organizational and IS factors of interest in this study and the dependent variable, post-merger IS integration success. This section introduces the different merger motives and the literature that helps support these claims.

Companies engage in mergers for many reasons. Most observers agree that mergers are driven by a complex pattern of motives, and no single approach can render a full account (Steiner, 1975; Ravenscraft, Scherer, 1987). However, some prevailing merger motives can be found in the literature. At the highest level, these motives can be categorized under two major approaches, a resource-based approach and a market-based approach.

Under a resource-based approach, which became a major strategy in the 1990s, the companies are looking for resource-related advantages, such as resource sharing, new technologies and capabilities, in-depth experience and skills (Ranft, Lord, 2002; Vermeulen, Barkema, 2001; Brown, Clancy, Scholer, 2003). Under this approach, firms opt to gain the needed resources from other firms, rather than relying on internal development or other mechanisms, such as alliances (Ranft, Lord, 2002). By acquiring new knowledge and resources, many firms seek to close the gap between their existing level of know-how and the level of know-how that they aspire to reach (Pennings, Barkema, 1994). Mergers are also used to create synergies in research and development (R&D) (Brown, Clancy, Scholer, 2003).

Under a market-based approach, the firms involved are seeking market-related advantages, such as market power gains, overcoming barriers of entry, vertical and horizontal integration, and product and market extension, to name a few (Vermeulen, Barkema, 2001; Ranft, Lord, 2002; Buono, Bowditch, 1989). The motives underlying the market-based approach can be grouped into three categories: financial, strategic, and operational. These are discussed further below. The market-based and resource-based approaches are not mutually exclusive.

2.2.1 Financial Motives

Under the efficiency theory of mergers, one of the reasons why mergers are planned and executed is to attain financial synergy (Trautwein, 1990; Gupta, Gerchak, 2002), where financial synergy refers to the way in which the two firms are financially similar or complementary. Empirical evidence also indicates that mergers increase net value, in that the combined firm value is typically larger than the sum of the values of each

individual firm (Gupta, Gerchak, 2002). Engaging in merger activity in an uncertain market allows sellers to acquire cash to offset losses in other businesses or foreign markets, while buyers with cash, on the other hand, may identify new opportunities to expand into new markets or vertically integrate (Gupta, Gerchak, 2002). In technology, particularly, sellers that are looking for buyers are looking to achieve liquidity, to merge with a strong partner, or a combination of those two (Borrell, 2001). In other cases, firms may be looking to attain capital for future leveraged buyouts (Buono, Bowditch, 1989), which is basically the acquisition of a company by purchasing a controlling percentage of its stock using borrowed money (Webster's Dictionary). In general, organizations select the acquisition strategy as an alternative or supplement to internal efforts aimed towards growth, diversification, or profitability, turning acquisitions into investment decisions (Fowler, Schmidt, 1988). If the merger is financially motivated, the degree of required blending of IT components between the firms may be negligible, as the technical and administrative changes may be limited to the sharing of financial risk and resources, and the standardization of basic management systems and processes to facilitate communication (Pablo, 1994).

2.2.2 Strategic Motives

The Federal Trade Commission (1975) has classified five basic types of mergers, namely horizontal, vertical, production extension, market extension, and unrelated (Buono, Bowditch, 1989). In horizontal mergers, companies may choose to merge or acquire target firms that provide very similar products in the same geographic market. General Motors used the horizontal approach in its initial phase by merging many small manufacturers (Hopkins, 1983). More recently, CVS Corp. bought Eckerd drugstores

from J.C. Penney Co. the summer of 2004, making it the largest drugstore chain in the U.S. with more than 5,000 stores (Wall Street Journal, 2004). In vertical mergers, companies may choose to merge or acquire target firms along their value chain, be it a supplier or a distributor of their products. GM's acquisition of Electronic Data Systems, the firm that provided the computer chips it used in its cars, is an example of a vertical M&A (Darlin, Guiles, 1984), and so is the Motorola and Intel forward move into the minicomputer market (Chatterjee, 1991). In product extension transactions, the firms merge or acquire firms with similar production or distribution mechanisms, but with different, non-competing products, illustrated by Procter & Gamble's acquisition of Clorox (Brozen, 1982). In the case of market extension mergers, firms merge or acquire companies that make the same product, in completely different markets, such as Borden Company, which operated a dairy in New York City, acquiring a dairy in another city. Finally, in unrelated deals, companies may merge or acquire firms that operate in a completely different environment, including the product and market, such as TransCo, a high tech manufacturer, buying Co-ops Foods, a food chain (Buono, Bowditch, 1989).

2.2.3 Operational Motives

Some firms engaging in mergers seek increased efficiency and operating synergy, which refers to the similarity or complementarities of the production and marketing between the merging businesses (Gupta, Gerchak, 2002). From a market-based view, the aforementioned horizontal mergers appear to provide the most operational benefits. Merging firms that produce the same or closely related products or services in the same geographic market can achieve significant economies of scale and operating efficiencies. The firms can also reduce overhead by integrating similar departments and functions

(Buono, Bowditch, 1989). According to Trautwein (1990), operational synergies stem from combining operations of separate units, or from knowledge transfer (Porter, 1985). In either case, operational synergies may lower the costs of the business units involved or may enable the company to offer unique products or services (Trautwein, 1990). Many corporate acquisitions are intended to develop organizational capabilities by focusing on the transfer of skills, and examining the intra-organizational dynamics and interactions that either facilitate or impede value creation (Rosenzweig, 1993).

As will be discussed further in the next section, merger motives impact the post-merger IS integration strategies selected, which subsequently influence the degree of IS integration required between the merged firms. For example, one of the rationales underlying horizontal mergers is achievement of significant operating efficiencies and economies of scale (Buono, Bowditch, 1989), which may translate into having to consolidate redundant systems and IS services across the merging firms and a high degree of IS integration. At the other extreme, in unrelated or conglomerate mergers, the companies remain disconnected, requiring low levels of IS integration, perhaps limited to establishing the proper communication channels between the two firms.

2.3 Integration Strategies and Degree of IS integration

IS integration strategies assist in establishing the direction which the IS management team follows to combine the IS components of the merged firms. The merger motives influence the IS integration strategies selected, and this section outlines how the IS integration strategies influence the degree of IS integration. While this study will not investigate merger motives or IS integration strategies directly, it does explore the

moderating role that the degree of post-merger IS integration may play on the influence of the independent variables, the factors, on the dependent variable in this study, post-merger IS integration success. The study argues that by considering the role of post-merger degree of IS integration required, merger motives and IS integration strategies are being indirectly represented in the study's Conceptual Model.

The IS integration strategies implemented are dictated by the merger motives, as well as environmental factors, such as the corporate cultures, geographies, lines of business, and organizational structures of the companies involved (Giera, 2004). The IS integration strategies selected have implications regarding the amount of planning and actual effort that goes into the IS integration. Researching how and why certain IS integration decisions are made along the merger timeline is an interesting area of merger research addressed by Mehta and Hirschheim (2004) and Johnston and Yetton (1996). The following studies identify specific IT and IS integration strategies.

Johnston and Yetton (1996) identify three IT merger strategies and models of change, namely coexistence (maintaining different configurations), absorption (of one configuration by the other), and best of breed (new integrated configuration). Under coexistence, minimal links between the firms are required. In the absorption strategy, the integration task is simplified, and under the best of breed approach, if compatible IT configurations exist, synergies are realized on a mix and match basis. However, if incompatible configurations exist, the recommendation is to build a new configuration over time.

Giacomazzi, et al. (1997) focus on the IS component by identifying six different integration strategies for the final configuration of the applications (software) and the

architecture of the new IS. The six strategies emanate from the matrix that views three categories of software (totally standardized, partially standardized, and adapted) and three categories of computer architecture for the new IS (totally centralized, partially centralized, and totally distributed). The authors group these six IS integration strategies into three main classes of behavior: total integration, partial integration, and no integration. The main attribute of the total integration strategy is the use of the same software packages and applications (standardization of applications) in the merged companies, while in partial integration, only the software packages that support the same business processes are used across the company. In the no integration strategy, all IS components are purposely kept independent, and the only linkages are those for transmission of data required for corporate management. In the descriptive model the authors present, growth objectives, such as the merger motives formerly discussed, influence the IS integration decision. In Chapter 2, Table 1, provides a consolidated view of the IS strategies presented by these authors, which may be used by future studies conducting IS integration strategy-related research.

Table 2.1 Consolidated IT and IS Integration Strategies

IS Integration Strategy	Description
Coexistence	The different firms' IT and IS components are kept independent without major modifications, allowing differences across the firms and resulting in minimal integration links.
Absorption	One of the merger firms absorbs the IS functions of the other into its own, resulting in the use of one set of IT and IS across the merged firms, also resulting in simplified integration tasks.
Best of breed	The merged firms adapt the best IT and IS components from each firm, resulting in a post-merger environment that combines the best of each firms' IS, and more complex, time-consuming integration tasks.
Transformation	The firms adopt new IT and IS altogether.

Adapted from Johnston, Yetton (1996), Giacomazzi, et al. (1997)

The amount of work and the degree of integration planning and actual effort to integrate the IS of the merging firms appears to increase from co-existence through the transformation strategy. Under the *co-existence* strategy, the firms keep different configurations, and the IS integration is minimal and limited to establishing communications components among the companies. Under the absorption strategy, where the acquirer's or senior merger partner's systems persist, the work involved pertains to migrating data from one set of systems to another. In the *best of breed* approach, the resulting company adapts the best components from both partner systems, which requires complex analysis and longer implementation time. Under a *transformation* strategy, adoption of a new system requires the type of effort associated with an enterprise-wide IS project, which can be laborious and time consuming to plan and execute. Therefore, in terms of the degree of IS integration required, this degree seems to increase from the co-existence strategy through the transformation strategy.

2.4 Post-Merger IS Integration Success and Merger Success

The literature supports the premise that post-merger integration success contributes to overall merger success. Thus, by investigating influences to IS integration success, this study is also addressing post-merger integration success and merger success, increasing our level our understanding of merger events. Some authors, which are presented in this section, make implicit references while others make explicit references to the link between IS integration success and merger success.

Lajoux and Weston (1998), Haspeslagh and Jeminson (1987), Ravenscraft and Scherer (1989), and Massimilian (2001) make *implicit* references to the link between

post-merger IS integration success and merger success. One of the primary causes of overall merger failure includes slow post-merger integration (Lajoux, Weston, 1998), including slow post- merger IS integration. Obstacles associated with the integration of operations can also result in the acquiring firm being unable to manage the integration of the target firm effectively (Haspeslagh, Jeminson, 1987), including the IS integration of the target firm. The profitability of firms, on average, actually declines after an acquisition, suggesting that implementation difficulties play a critical role in determining the eventual performance of an acquisition (Ravenscraft, Scherer, 1989). By addressing antecedents to merger *failure*, Lajoux and Weston (1998), Haspeslagh and Jeminson (1987), and Ravenscraft and Scherer, (1989) point to antecedents of merger *success*, specifically faster integrations, less obstacles in integrating operations, and less implementation difficulties. IS, enabling the creation of products, services, distribution channels, and links with customers, suppliers, and other stakeholders, is interwoven with almost every aspect of modern organizations, their business networks, and their environment as a whole (Van Der Zee, De Jong, 1999). As such, IS integrations would be a major component in achieving faster merger integrations, fewer obstacles in integrating operations, and fewer implementation difficulties.

Massimilian (2001) presents four principles of a successful [merger] integration. In this author's view, mergers that deliver superior returns and justify their acquisition premiums are those that have been designed and implemented with the following four imperatives in mind: 1) designed integration—a clearly defined business case must drive the integration process; 2) differentiated leadership—leadership roles and governance structure must be clearly articulated early on, despite certain unavoidable missing links;

3) an integrative perspective—careful consideration must be given to the human aspects of the deal, not simply the financial and strategic elements; and 4) expanded due diligence—organizational issues must be addressed before the deal is done, and, after the close, appropriate levels of resources must be devoted to combining management processes and organizational infrastructure. The "designed integration" imperative suggests paying careful attention to how the functions, operations, IS and other firm components will be combined, including a designed IT integration, one that should also be driven by a clearly defined business case. The imperative of expanded due diligence is actually very relevant to IS and IS integration success. Prior to the merger being implemented, the IS fit between the firms should be assessed, and IS professionals should partake in the entire process so that integration problems can be brought to light early, thus increasing the chance for a more successful implementation (Buck-Lew, et al., 1992). These are activities that would be performed by the IS teams as part of due diligence in the evaluation phase of a merger.

Light (1999), Weber and Pliskin (1996), Bailey (2001), Robbins and Stylianou (1999), and Buck-Lew et al. (1992) *explicitly* support that IS integration success contributes to overall merger success. Light (1999) finds that better performance is strongly related to high level of integration, meaning that banks that proceed to quickly combine functions, productions, systems, and branches gain higher payoffs than those that take a more hands-off approach.

Weber and Pliskin (1996) concur with Light's findings by linking the value of integrating IS during mergers to merger performance (See Appendix A under M&A Integration for more details on this study). Specifically, Weber and Pliskin (1996) find

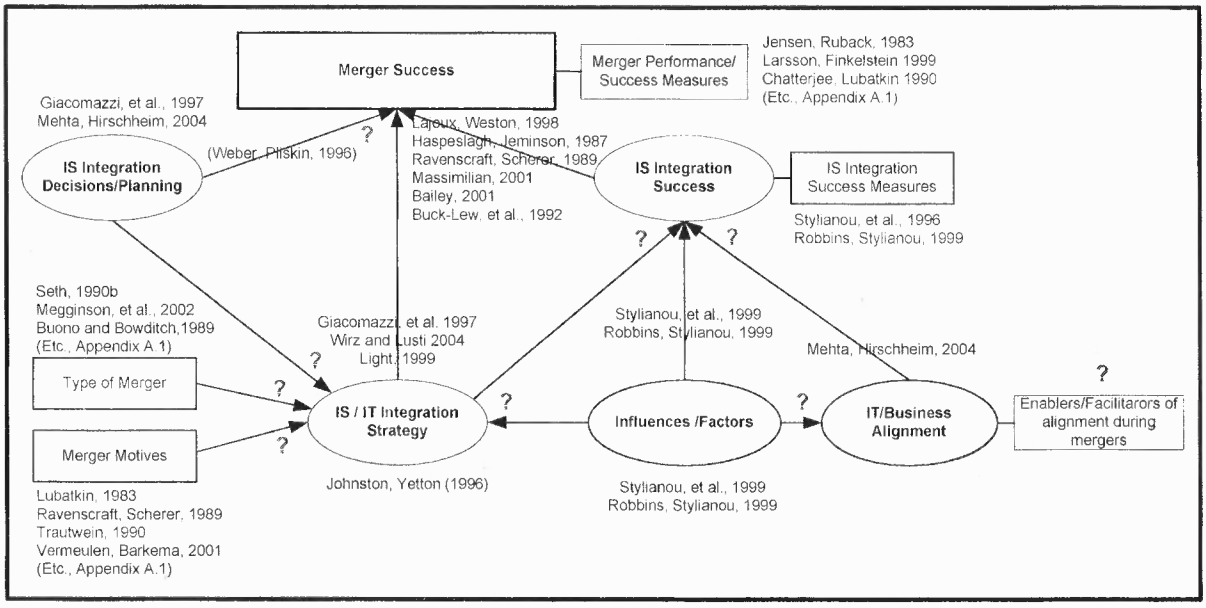

Figure 2.1 Summary of IS and merger research.

2.2 Merger Motives

This study posits that the merger motives influence the post-merger IS integration strategies selected, and ultimately the degree of IS integration required. It also claims that the degree of IS integration moderates the relationship between the organizational and IS factors of interest in this study and the dependent variable, post-merger IS integration success. This section introduces the different merger motives and the literature that helps support these claims.

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2.5 The Merger Lifecycle

Throughout the merger process, or merger lifecycle, various activities take place, ranging from defining objectives, planning the deal, engaging in due diligence activities to learn more about the target firm, negotiating a fair price for the target firm, to actually implementing the deal and conducting the integration required. This section introduces a five-phase merger lifecycle approach based on an analysis and synthesis of three different studies. A review of these five phases exposes the types of activities transpiring in each, knowledge that is essential when discussing the specific role of the IS teams throughout the merger lifecycle, and the gaps that currently exist. IS integration is often given insufficient priority in merger discussions, with the management seemingly focusing more on the strategic and organizational compatibility of the two firms and leaving the IS issue to a later state (Buck-Lew, et al., 1992; Stylianou, et al., 1996). As the remainder of this chapter will indicate, the literature points to a lack of IS teams' participation in the merger lifecycle, including phases that precede the actual integration, i.e. merger and integration planning. This study argues that the participation of the IS teams, at the right level, would help post-merger integration performance.

The researcher derived the following five-phase, integrated merger approach (Chapter 2, Table 2) by analyzing and identifying the similarities among Haspeslagh and Jeminson's (1991) three-phase approach, Aiello and Watkin's (2000) five-phase approach, and Breindenbach's (2000) six-phase M&A approach. The *integrated description* displayed next to each of the five integrated phases is the result of combining the definitions from these three sets of authors for each particular phase. The results

(Chapter 2, Table 2) exclude Breindenbach's Operation Phase because by the time this phase is reached, the IT integration should be complete.

Table 2.2 Five-Phase, Integrated M&A Approach

Phase	Integrated Description
Strategy	Assess the firm's business situation. Decide if a M&A strategy will satisfy the business objectives. Review potential deals in the market, keeping the original strategy in the forefront.
Planning	Select candidate targets, or engage investment bankers to do so. Estimate a bid that will qualify the firm as a suitor. Identify the details critical to the deal's success.
Evaluation	Upon the firm's qualification as a bidder, conduct due diligence on the selected target by conducting a more detailed analysis. From this information, identify a fair bid price, and confirm whether the target is a good strategic fit. Increase the understanding of the target's operating managers.
Acquisition	If the bid is accepted, start the legal and financial negotiation about the final terms and conditions of the M&A. Negotiate on several fronts simultaneously. Have alternatives to this deal. Anticipate what competitors may do. Continue an even more detailed level of due diligence.
Integration	Finalize the deal with a formal M&A agreement. Announce the M&A to the public and shareholders. Close quickly after setting final terms. Start the process of combining or integrating the two companies.

Adapted from Haspeslagh, Jeminson (1991), Aiello, Watkins (2000), Breindenbach (2000)

In the *strategy* phase, an assessment of the firm's existing business situation takes place and the decision of whether a merger strategy is appropriate is made, along with a review of potential deals currently in the market.

In the *planning phase*, the firm begins to plan a potential merger by identifying attractive targets that would be good strategic fit with the firm. This phase also consist of estimating a bid that would qualify the firm as a suitor, and identifying the details that would make the deal successful.

Throughout the *evaluation* phase, due diligence activities take place, including the detailed review of all aspects of the selected target, for the purpose of identifying a fair and realistic offer price and confirming that the target is indeed a good strategic fit.

In the *acquisition* phase, the legal and financial negotiations over the final merger terms and conditions begin, while also perhaps considering an alternative deal. In this phase, a more detailed level of due diligence effort continues, and both companies launch a detailed review to determine if the proposed merger would work from each of their perspectives.

Lastly, in the *integration* phase the merger agreement is formalized, the deal is closed, and the deal is announced to the public and shareholders, and most importantly, the potentially arduous and complex task of combining the two companies begins, based on the specific goals of the merger.

2.6 The Role of the Senior IS Executive

For the purpose of describing the role of the IS teams during mergers, the researcher addresses the position of the senior IS executive, someone who is ultimately responsible for the different components of the IS function within the organization. The Senior IS executive's responsibilities include: 1) managerial roles requiring effective communication with executive management; 2) a broad corporate perspective in managing information resources; 3) influence on organizational strategy; and 4) responsibility for the planning of IS to cope with a firm's competitive environment (adapted from Grover, et al., 1993).

The senior IS executive position has been changing and becoming more linked with the business and overall business success, as the growing importance of technology to competitiveness increases (Adler, Ferdows, 1990). The senior IS executive may hold various titles, namely Chief Information Officer (CIO), IT Director, Vice President of IS, Director of Information Resources, Director of IS (Grover, et al., 1993).

The CIO position gained increased prominence over the 1990s (Chatterjee, et al., 2001). According to these authors, not only has the CIO become increasingly common in all types of firms, CIOs are also contending for Chief Executive Officer (CEO) openings, specially with technology or information-based businesses looking for a chief executive possessing a strong combination of technology and business skills (Hutheesing 1999; Mateyaschuk, 1999).

Chatterjee, et al. (2001) identify that strong executive leadership, as reflected in the CIO position, is likely to play a crucial role in the effective deployment of IS capabilities, and hence be highly valued by firm's shareholders. IS capability refers to the extent to which the technologies needed for manipulation, storage, and communication of information are available within the organization (Sabherwal, Kirs, 1994).

Kappelman and Windsor (1997) highlight the main differences between the traditional and new role of the CIO. According to these authors' interview with a former CIO, the traditional role of the CIO was to ensure that information technology was readily available upon demand, allowing management to make quicker, better, and more decisions. As of 1997, however, the issues were more strategic in nature by being more focused on questions such as *what business are we going to be in? what critical skills do*

we need? And *how do we manage those skills now?* In this light, the role of the senior IS executive would be closely tied, ideally, to some of the activities that occur in the strategy phase of a merger.

As more executives recognize the power of IS to reengineer their businesses and improve their businesses' effectiveness, many CEOs and line managers are looking for CIOs who not only understand technology but also comprehend technology's potential to affect business strategy (Karimi, et al., 1996). Specifically, the role of the IS leader has changed from a single-threaded, hands-on management approach to one that is multi-dimensional (Karimi, et al., 1996). This new role is more closely linked to corporate business strategy and requires IS leaders with business knowledge and skills (Karimi, et al., 1996).

As IS technology evolves to the point where most of the systems supporting basic business functions touch almost everything being done within a company, CEOs are looking for new skills and perspectives from their CIOs (Launchbaugh, 2002). The highest priorities for a CIO have become relationship management, business partnerships, sourcing strategies, and visionary leadership (Launchbaugh, 2002). The new CIO's role is strategic, focused on sharpening top-level business needs and expectations across the enterprise, rather than technology implementation, and in many enterprises, the actual management of IS is falling to an IS deputy, often called the CTO (Launchbaugh, 2002). The major responsibilities for the CTO includes: 1) coordination among business units' technological efforts; 2) representation of technology within the executive management team; 3) supervision of new technology development; assessment of technological aspects of major strategic initiatives; 4) management of the external technology

environment, such as universities and other research organizations, as well as regulatory agencies (Adler, Ferdows, 1990). Most recently, the role of the senior IS leader has expanded to one that: understands technology and recognizes profitable applications to products, services, and processes (Smith, 2003); is required to shape and set expectations across the firm and to make IT and information policy dovetail with organizational priorities (Potter, 2003; Dearstyne, 2006).

Regarding the evolution of the role of the IS leader, Karimi et al. (1996) present a concise summary of the IS literature's findings. Chapter 2, Table 3 expands on the references provided by Karimi et al. (1996) and enhances the original format by organizing the references in chronological order. In this table, the additional references are indicated by *italics*. This summary is one of the contributions of this study.

Table 2.3 IS Literature Summary - Evolution of the Role of the IS Leader

Author/Year	Results/Findings
Rockart, et al., (1982)	Predict a "new" and evolving role for the CIO. They predict three emerging roles for CIOs: 1) decentralization of offline responsibilities to divisions and departments, 2) staff orientation, and 3) corporate responsibility for information resource policy and strategy.
Benjamin, et al., (1985)	Confirm that the above three predictions were realized. Identify that the problem for IT leaders in not one of acknowledging the needed change in their roles and responsibilities, but rather it is one of adapting to it successfully.
O'Riordan, 1987	*Outlines six characteristics of the successful CIO as someone who: Is a business person, can understand technology from a business perspective, is able to maintain an overall view of business needs, is able to cross departmental boundaries, is innovative and flexible, and is able to communicate well.*
Keen, 1988	Suggests that too many firms create a CIO simply by promoting their data-processing managers.
Earl, 1989	IT leaders see themselves as corporate officers and general business managers. Suggests that IT leaders must be politically savvy and that their high profile places them in contention for top-line management jobs. Points out threer "leadership" qualities for the IT leader: 1. Business leadership – for connecting the use of the IT with the business needs and strategy 2. Technology leadership – for shaping appropriate technology policies for the firm 3. Organizational leadership – for managing the function and its specialist groups Firms in each of the four cells of the McFarlan "strategic grid" (McFarlan, 1984) need different types of IT leaders to manage the IT functions. In a firm where IT plays primarily a support role, it may be acceptable to have an IT leader who spends most of his/her time interacting with employees within the IT organization. However, in firms where IT has a strategic role, and where IT is critical in achieving corporate goals, IT leaders should have multidimensional roles. They should have business, strategic, and political skills, and a conceptual and visionary mind. A factory situation requires strong hands-on, performance-oriented IT leaders with technical and managerial skills. Turnaround firms should look for visionary, strong champions who have an excellent understanding of the business and are proactive to lead their IT. Support firms can tolerate a service-oriented technical leader with a hands-on internal style.
Miller, 1989	*Suggests that the CIO's real problem is in marketing IS solutions to his own management and employee base. Explains that no matter how good the technology is, if the employees reject it, it will not work. He also notes that the opposite is true: no matter how cumbersome a technology is, if the workers want to, they can make it succeed.*
Rothfeder (1990)	Predicts that in five years from the study virtually, every major firm will have a CIO who is a peer to the CEO.
Hopper, 1990 Moad, 1990 Ives, 1992	Contrary to Rothfeder, predict the end of the "new era" for the CIO. Suggest that the CIO role will recede into the background as IT becomes more accessible.
Watson, 1990 Applegate, Elam, 1992	Claim that when IT served a strictly supportive function in firms, it was all right for the IT leader to be a technical expert and competent manager. State that in the "information era" of the 1990s, however, the IT leader has to act as a link between IT and other firm executives.

Table 2.3 IS Literature Summary - Evolution of the Role of the IS Leader (Continued)

Author/Year	Results/Findings
Boyle, Burbridge, 1991	*Suggest that adaptation to the "corporate culture" has a greater effect on CIO success than even a company's need for a CIO does. Insist that one of the CIO's main jobs is that of working with managers to assure common IS architecture and standards. The successful CIO is one who not only maintains intra-company compatibility, but compatibility with the information technology used by customers and suppliers as well.*
Cash, et al., 1992 Synott, 1987	Suggest that the role and qualifications of the IT leader should be radically changed so that it is consistent with the needs of the firm in identifying and exploiting the opportunities to use IT. Cash, et al. (1992) contend that while for some firms [IT] activities represent an area of great strategic importance, for other firms, they play, and appropriately will continue to play, a cost-effective, useful, but distinctly supportive role. It is inappropriate for firms with supportive IT to expect that the same amount of senior management strategic thinking should be devoted to the IT organization as in firms of the former type.
Hershey, Eatman, 1990 Applegate, Elam, 1992 Feeny, et al., 1992 Moad, 1994a	Outline new roles and responsibilities for the IT leader, including: spending more time with business and in business training, focusing on improving business processes, and explaining IT cost in business terms.
Applegate, Elam, 1992	Indicate that the IT leader is becoming a member of the top management team and participates in a firm's strategy development. However, according to Thomas M. Lodahl, chairman of CogniTech Services of Easton, "only 30% of top IT managers are included in high-level strategic planning, and there is still a perception on the part of most CEOs that IT strategy can be developed independently of business strategy.
Hayley, et al., 1993	Identify that CIOs' involvement and leadership role in the firm's business process re-engineering efforts increased.
Grover, et al., 1993	Find that the IT leader is more a managerially oriented executive than a technical manager.
Earl, Feeny, 1994	Based on studies of CIOs in 60 firms, conclude that the CIOs' ability to add value is the biggest single factor in determining whether a firm views IT as an asset or liability. They further suggest that the CIO adds value by building informed relationships with key executives, making sure that the IT requirements become an integral component of business strategy.
Moad, 1994	Indicate that IT strategy cannot be developed independently of business strategy.
Ross, et al. 1996	*Suggest that for IT to create strategic advantage, it must develop the ability to: 1) control IT-related costs; 2) deliver systems when needed; and 3) affect business objectives through IT implementation. For this to occur, IT must possess: a competent and motivated IS staff with the appropriate skills; a reusable technology based; and a partnering relationship with the business units.*
Romanczuk, Pemberton, 1997 *Reimus. 1997*	*Due to senior executives growing weary of IT's unfulfilled promises to create competitive advantage, enable business transformation, drive down costs, and improve customer service, propose the replacement of the technically oriented CIO by a non-IT executive.*

Table 2.3 IS Literature Summary - Evolution of the Role of the IS Leader (Continued)

Author/Year	Results/Findings
Strassmann, 1995	*Due to senior executives growing weary of IT's unfulfilled promises to create competitive advantage, enable business transformation, drive down costs, and improve customer service, propose distributing IT to the business units.*
DiRomualdo, Gurbaxani, 1998 *Earl, Sampler, 1998* *Venkatraman, 1997*	*Due to senior executives growing weary of IT's unfulfilled promises to create competitive advantage, enable business transformation, drive down costs, and improve customer service, recommend outsourcing the IT function to specialized technology firms.*
Maruca, 2000 *Ross, Feeny 2000*	*Indicate that more recently, as CIOs have gained acceptance on their firms' top management teams, they require skills in applying lateral influence, in order to convince their peers in other functional areas to commit to IS initiatives.*
Hirschheim, et al., 2003	*Indicate that corporations have been successful not in spite of IT but because of IT. It's important that top management, IT leaders, and the IT professional share positive perceptions of IT leaders and organizations. IT and its contributions are inseparable from any corporation's success. It's the IT profession's task to ensure that its contributions are accurately recorded in the history.*
Smith, 2003	*Suggests that the significant role of technology in strategic business decisions has created the need for executives who understand technology and recognize profitable applications to products, services, and processes. To address this need, companies have appointed a chief technology officer (CTO) whose responsibilities include:* *1) monitoring new technologies and assessing their potential to become new products or services* 2) *overseeing the selection of research projects to ensure that they have potential add value to the company* 3) *providing reliable technical assessments of potential mergers and acquisitions* 4) *explaining company products and plans to the trade media* 5) *participating in government, academic, and industry groups where there are opportunities to promote the company's reputation and to capture valuable data.* *Integrating these knowledge-based activities into the corporate strategy requires that the CTO nurture effective relationships with key people throughout the company, including the CEO, members of the executive committee, chief scientists, research laboratory directors, and marketing leaders.*
Potter, 2003	*Indicates that CIOs must manage their superior's expectations regarding system delivery and performance if they want to survive and progress as strategic executives and agents of change. CIOs who survive work to see that the boss's expectations are realistic, on track, and well satisfied.*

Table 2.3 IS Literature Summary - Evolution of the Role of the IS Leader (Continued)

Dearstyne, 2006	*Indicates that CIOs used to be IT masters. With added responsibilities in an increasingly complex environment, they are finding a new mix of skills is needed. These include:* *1) ability to create a vision,* *2) leadership,* *3) a knack for interpreting and explaining complex, sometimes seemingly arcane, issues and problems so that non-experts can understand,* *4) ability to shape expectations and keep reshaping them as the organization moves ahead,* *5) capacity to make IT and information policy dovetail with organizational priorities, and* *6) ability to build a team and manage, empower, and inspire people.*

2.7 Senior IS Executive Challenges

In this study, the senior IS executive is the primary representative of the IS teams. The literature suggests that the role of the senior IS executive is a strategic one, which implies that the person performing this role would have a vested interest in strategy-related organizational events, such as mergers. However, currently, senior IS executives appear to face many challenges that ultimately hinder their ability to perform many of their role's responsibilities, specifically during mergers. These challenges seem to point to an existing gap which indicates misalignment between business and IS organizations, and perhaps to one of the reasons why merger integration performance researchers have paid little attention to the IS teams and the IS integration.

Although it was originally expected that the CIO would have high levels of influence within the firm, as the definition of the aforementioned role responsibilities would suggest, surveys point out that this may not be the case (Grover, et al., 1993). CIOs may not actually possess strategic influence with executive business management and they may lack operational and tactical influence with users (Carlyle, 1990; Watson,

1990). Other specific problems include: diminished power with belt tightening and budget cuts, lack of secure power basis due to the fact that CIOs are viewed as outsiders by other top executives, and the fact that 40% of CIOs report to the firm's chief operating officer, only 10% participate in strategic planning, and even fewer report to the CEO (Rothfeder, Driscoll, 1990). Finding that other business senior executives view CIOs as outsiders, in particular, helps explain their absence in business strategic planning. The lack of strategic influence and the perception that the CIO is an "outsider" point to the diminished role of the IS teams during the merger.

Stephens, et al. (1992) find that although all CIOs in their study have responsibility for corporate-wide strategy regarding the use of information resources, only 43% felt they were part of the management team that sets corporate strategy, and only 20% reported that they attend all strategy meetings. This poses a problem as business management teams that set corporate strategy discuss mergers during strategy meetings. By not being part of these critical strategy-setting meetings, the IS teams cannot be effective at supporting business strategy.

One of the CIO's biggest challenges is recognition by CEOs of the role the CIO should play in organizations (Smaczny, 2001). This challenge is not one-sided, in that CIOs also need a better understanding of the business the company is in, to proactively develop their understanding of the business strategy frameworks available, and to increase their credibility among their senior executive colleagues (Smaczny, 2001). If there were greater alignment between the business and IT strategy, recognizing the role that the CIO should play in an organization would not be such a challenge, as the

alignment itself would facilitate the clear understanding that IT strategies must support, enable, and stimulate business strategies.

Another challenge pertains to activities that the IS teams are expected to perform related to the integration phase of the merger. To address integration risks successfully, Bailey (2001) and Calabrese (1991) recommend having IS establish a strong business case for participation in the earliest phase of the merger lifecycle. Early participation is essential to set realistic expectations regarding integration achievement of economies of scale and to define the strategic role of IS in supporting effective business processes with the new organization (Bailey, 2001; Robbins, Stylianou, 1999). However, senior business management teams are excluding the CIO from strategic discussions, preventing early participation in the merger process, and jeopardizing a successful IS integration.

Furthermore, to attain the goals of the merger, or meet the merger motives, firms may require restructuring, which can produce dynamic opportunities for corporations, as well as generate problems (Stylianou, et al., 1996). The IS teams are often ignored in the merger planning process (Johnson, 1989; McCartney, Kelly, 1984). In an ideal situation, prior to the transaction being implemented, the IS fit between the firms should be assessed, and IS professionals should partake in the entire process so that integration problems can be brought to light early, thus increasing the chance for a more successful implementation (Buck-Lew, et al., 1992). However, in most cases, IS issues are an afterthought (Calabrese, 1991). These findings also signal a gap in the view of business and IS organizations concerning the role the IS teams should play during the merger.

In the merging planning process, part of the problem is that the IS teams may not be aware of the merger until the merger is publicly announced. Lajoux (2006) believes that it is usually best to make merger announcements as far along in the process as possible. The simple reason is that many seemingly successful merger negotiations break down even after the price and key terms are agreed upon in a "handshake" deal. Whether in a private or public company, aborted merger talks that have previously been announced can cause ill will with the stakeholders of the two companies (Lajoux, 2006). Pushing in the other direction are concerns about leaks and rumors, with the resulting uncertainty and erosion of confidence. The challenge is to do everything possible to avoid such leaks as long as possible and to be ready to make a carefully planned and well-staged public announcement if rumors cannot be suppressed (Lajoux, 2006). In part, these reasons, along with fear of insider trading, may keep the IS teams in the dark and removed from the merger planning process until the merger is publicly announced. A late merger announcement presents a challenge for the IS teams in that it may limit the teams' ability to conduct due diligence activities that could surface valuable information regarding IS gaps, incompatibility of IS environments, outdated infrastructure, etc., all of which could impact the value of the target to the acquirer, and affect the target company's bid price. It may also limit the IS teams' ability to start planning for the challenges that may arise during the IS integration of the two companies.

Furthermore, on the topic of IS integration, integrating systems is extremely complex, and the lack of IS planning prior to implementing the merger delays the integration process (Robbins, Stylianou, 1999). Stylianou, et al. (1996) indicate that integrating new systems quickly can be an extremely difficult task for the following four

reasons. First, corporate planning usually excludes IS personnel in the planning process, and in most cases, IS integration planning does not typically occur prior to the merger implementation, thus delaying the integration process. Second, cultural differences often plague the new corporate structure (Buono, Bowditch, 1989; Weber, Pliskin, 1996). These are differences associated with the set of important assumptions (often unstated) that members of communities share in common (Weber, Pliskin, 1996), e.g., reward systems, policies and procedures. Third, the lack of planning results in shifting priorities relative to other IS projects. And fourth, technological issues associated with compatibility, software and hardware redundancies, standards and connectivity require resolution. Stylianou, et al. (1996) find that the degree of IS participation at the decision-making level was rather low, in cases when an IS integration occurred. They also find that IS participation in high quality merger planning seems to play an important role in the IS integration success.

From these references, it is apparent that the effective participation of the IS teams in the merger lifecycle, represented by the participation of the senior IS executive, is challenged by poor strategic influence, lack or diminished power, lack of participation in strategic business meetings and corporate planning sessions, exclusion by fellow senior management business executives, poor recognition of the role of the CIO in the organization, lack of IS integration planning, which leads to slower implementations.

The lack of the IS teams' participation at the early phases of the merger, specifically, is a manifestation of business-IT strategic misalignment. Some authors suggest that business-IT alignment heightens the status of IS within the organization, thus facilitating the financial and managerial support necessary to effectively implement

innovative systems (Chan, Huff, 1982; Das, et al., 1991; Henderson, et al., 1987). Furthermore, Segars and Grover (1998) highlight that alignment may be manifested through an understanding of organizational objectives by: top IS planners (King 1978; Lederer, Mendelow, 1987; Lederer, Sethi, 1988); a perceived need to change IS objectives as a result of changes in corporate strategy (Das, et al., 1991; King 1988); reciprocal understanding between top managers and IS planners (Boynton, Zmud, 1987; Earl 1989); and a heightened view of the IS function within the organization (Henderson, Sifonis, 1988; King 1978; Lederer, Sethi, 1988). The absence of these indicators signal low levels of business-IT strategic alignment. Luftman (2003) indicates that most companies today are at level 2, committed process, with some attributes of level 3, established focused process, based on over 50 Global 200 companies and government agencies that had participated in the study by the time of the publication (Luftman, 2003).

The misalignment appears to be the source of the limited role allotted to the IS teams during mergers by business and IS organizations within the merging firms. This indicates that there is a need to address business-IT strategic alignment as a corporate strategic initiative, with the goal of positively impacting IS integration success and overall merger performance.

2.8 IS teams Participation in the Merger Lifecycle

Although challenged in practicality, the academic and business literature provides clear indication that the IS teams can participate throughout the merger lifecycle effectively. This section introduces the result of the literature review which shows that, if properly involved, the IS teams can make valuable contributions throughout the merger process.

In the *strategy phase*, it is recommended that IS team leaders participate in strategy related activities, as members of the senior management/strategic policy committee, communicate with corporate/business management in order to better understand organizational goals, objectives, and direction, and to ensure that new opportunities made possible by IT are seized, and take a proactive stance in looking for ways that IS could promote as well as support strategy (Applegate, Elam, 1992). The leaders of the IS teams should set management system planning objectives consistent with the firm's overall goals, and as a change agent influence future strategic direction and opportunities of the organization (Grover, et al., 1993). Similarly, they are prescribed to develop IS strategy dependent on business strategy (Moad, 1994), to be present, along with business executives when business strategy is being discussed, to get involved in strategic development (Luftman, Brier, 1999), and to gather and assess information on merger goal, business intent, IT portfolio, and system risk (Popovich, 2001). IT personnel need to understand the general philosophy of the merger, the goals of the new organization, and the expectations for integration so that implementation activities are properly aligned. By being involved early, IS teams can begin learning about their new partner, identify cost-saving opportunities, and organize and plan for the implementation (Popovich, 2001). To justify their place at the table of strategic planning, it is recommended that IS team leaders formulate a structured merger process model for IS that minimizes the risk of post-integration operational failures while maximizing opportunities for enhancing IS contribution to business efficiency (Bailey, 2001). By demonstrating the ability to address operational issues as well as align infrastructures

with business goals, the IS department can use the post-merger integration process to deliver value to senior management and to the organization as a whole (Bailey, 2001).

In the *planning phase* of the merger, the leaders of the IS teams are recommended to act as change agents, influencing future strategic direction and opportunities of the organization and impact the selection of targets (Grover, et al., 1993). Additionally, it is suggested that they provide the IS perspective as it relates to the potential operational integration issues with the target and walk other senior managers through all the work that needs to be accomplished so they can set realistic expectations and set accurate savings estimates. This facilitates estimating a bid and identifying details critical to the deal's success (Breindenbach, 2000).

During the *evaluation phase* of the merger, the IS teams should identify whether special synergies exist related to the IS resources between acquiring and target firms (Hayward, Hambrick, 1997), outline the strengths and weaknesses of the technologies in question, provide realistic estimates on integration efforts, one-time integration cost, and reaching a payoff point, all of which allows planning for and achieving estimated savings during the integration (Luftman, Brier, 1999). During due diligence, IS teams should provide a well defined due diligence questionnaire and methodology (Breindenbach, 2000), gather information on benefit packages of IS people, identify the structure of the IS organization and the technology portfolio, set realistic expectations regarding the integration and achievement of economies of scale, and define strategic role of IS in supporting business processes with the new organization (Bailey, 2001). The IS teams should also identify if there are knowledge-based resources that reside in human and social capital (Ranft, Lord, 2002), and help assess the estimated cost of the integration of

the firms from an IS perspective, based on the goal of the M&A (Vermeulen, Barkema, 2001).

During the *acquisition phase* of the merger, the due diligence activities that started during the evaluation phase intensify. Thus, the prescriptions for IS teams during due diligence in the evaluation phase persist during the acquisition phase.

In the iterative (Bailey, 2001), i*ntegration phase* of the merger, when the combination of the firms occurs, the IS team leaders are prescribed to facilitate and manage core business process re-design, assess, and align the IS organization within the enterprise according to merger changes (Brancheau, et al., 1996). They should provide vision, identify the relationship that will exist between the firms, work with senior managers to create common values, build leadership prospects from within the target firm, and form partnerships (Cliffe, 1999), while identifying and managing leadership style clashes among the firms' IS teams (Datta, 1991; Schneider, 2003). They should gather information on the structure of the IT organization, establish an IT merger leadership team to assess the technology portfolio, open lines of controlled communication, and develop an integrated implementation plan based on business strategies, work process and system needs, and synergy targets (Popovich 2001). They are prescribed to focus on maintaining operations and achieving stated synergies by retaining key people, completing knowledge capture, and consolidating IS operations (Popovich 2001). Relevant to human capital, the IS team leaders should act as integration champions, ensuring that people issues are addressed throughout the process (Culick, 2002), implementing the transfer and combination of knowledge for the IS organization, and ensuring that knowledge-based assets, or people, do not get lost in the

transition (Connor, 2001). They should also develop action plans to minimize the potential intangible losses such as experience/memory, motivation, commitment, and competence found in people (Larsson, et al., 2001), to mitigate resistance among IS resources, address potential culture clash among acquired IS resources (Larsson, Lubatkin, 2001), and gather information on benefits packages of IS people (Popovich 2001). Furthermore, in the integration phase of the merger, IS teams are prescribed to drive the IS integration effort (Breindenbach, 2000; Krishnan, Park, 2003) and manage IS integration risk (Bailey 2001), while delivering and implementing new systems accordingly, building and managing infrastructure, re-skilling the IS organization, and managing vendor partnerships (Rockart, et al., 1996). In addition, they are recommended to conduct full disclosure and comparative analysis of the relevant systems, ensure that information is freely shared and change processes as needed for faster response to current demands (Brown, et al., 2003). IS teams should help direct the combined organization towards desired goals, specifically those impacted and related to IS (Krishnan, Park, 2003).

The result of the literature review on the role of the IS teams throughout the merger lifecycle is encapsulated in Chapter 2, Table 4, and includes the five merger phases, the authors whose findings and/or suggestions the researcher associates with the IS teams' participation in a particular phase, and the specific activities that the IS teams can perform in each phase.

Table 2.4 Support for the IS Teams' Participation throughout the Merger Phases

Strategy Phase	Authors	IS Executive Contribution
Decide if a M&A strategy will satisfy the business objectives. Review potential deals in the market.	1. Applegate, Elam, 1992 2. Grover, et al., 1993 3. Earl, Feeny, 1994 4. Moad, 1994 5. Rockart, et al., 1996 6. Kappelman, Windsor, 1997 7. Stewart, 1998 8. Luftman, Brier, 1999 9. Hirschheim, Sabherwal, 2001 10. Popovich 2001 11. Smaczny, 2001	1. Participate in strategy related activities, as members of the senior management/strategic policy committee. Communicate with corporate/business management in order to better understand organizational goals, objectives, and direction, and to ensure that new opportunities made possible by IT are seized. Take a proactive stance in looking for ways that IT could promote as well as support strategy. 2. Set management system planning objectives consistent with the firm's overall goals, and as a change agent influence future strategic direction and opportunities of the organization. As "monitor" scan the external environment to keep up with technical changes and competition, identify new ideas. 3. Focus on business imperatives. Build informed relationships with key executives, making sure that IT requirements become integral components of business strategy. 4. Develop IT strategy dependent on business strategy. 5. IT must be present when business strategy is being discussed. 6. Focus on strategic issues such as "what business are we going to be in?" 7. Recognize the things that are critical to the firm and become focused on those things, while being flexible and adaptable. 8. Get involved in strategic development (enabler of business-IT alignment). Both IT and business executives must be present when business strategy is being discussed. 9. Organizations should always have a high level of strategic IS alignment. When organizations need to change business or IS strategies, they should, in a synchronized manner, also modify all four other aspects of strategic IS alignment, namely business strategy, IS role, IS sourcing, and IS structure, such that alignment is maintained. 10. Gather and assess information on merger goal, business intent, IT portfolio, and systems risk. 11. Understand the business strategy frameworks available.

Table 2.4 Support for the IS Teams' Participation Throughout the Merger Phases (Continued)

Planning Phase	Authors	IS Executive Contribution
Select candidate targets. Estimate a bid. Identify the details critical to the deal's success.	1. Grover, et al., 1993 2. Breindenbach, 2000	1. As a change agent, influence future strategic direction and opportunities of the organization. Impact the selection of targets. 2. Provide the IT perspective as it relates to the potential operational integration issues with the target. Walk other senior managers through all the work that needs to be accomplished so they can set realistic expectations and set accurate savings estimates. This facilitates estimating a bid and identifying details critical to the deal's success.
Conduct due diligence on the selected target by conducting a more detailed analysis. Identify a fair bid price. Confirm whether the target is a good strategic fit. Scrutinize the target's operating managers.	1. Grover, et al., 1993 2. Hayward, Hambrick, 1997 3. Luftman, Brier, 1999 4. Breindenbach, 2000 5. Bailey 2001 6. Vermeulen, Barkema, 2001 7. Ranft, Lord, 2002	1. As an "entrepreneur" ensure that rapidly changing technologies are *understood, planned*, implemented and capitalized on in the organization. 2. Identify if unique and private synergies exist related to the IT resources between acquiring and target firm. 3. Outline the strengths and weaknesses of the technologies in question. 4. Provide realistic estimates on integration efforts, one-time integration cost, and reaching a payoff point, which allows planning for and achieving estimated savings during the integration. Provide a well defined due diligence questionnaire and methodology. 5. During due diligence, gather information on benefit packages of IT people, the structure of the IT organization and the technology portfolio. Set realistic expectations regarding integration, achievement of economies of scale and define strategic role of IT in supporting business processes with the new organization. 6. Help assess the estimated cost of the integration of the firms from an IT perspective, based on the goal of the M&A. 7. As part of the due diligence, identify if there are knowledge-based resources that reside in human and social capital.

Table 2.4 Support for the IS Teams' Participation Throughout the Merger Phases (Continued)

Acquisition Phase	**Authors**	**IS Executive Contribution**
Start the legal and financial negotiation about final terms and conditions. Negotiate on several fronts simultaneously. Continue an even more detailed level of due diligence.	1. Bailey, 2001	1. During due diligence, gather information on benefit packages of IT people, the structure of the IT organization and the technology portfolio. Set realistic expectations regarding integration, achievement of economies of scale and define strategic role of IT in supporting business processes with the new organization.
	2. Ranft, Lord, 2002	2. As part of the due diligence, identify if there are knowledge-based resources that reside in human and social capital.
Integration Phase	**Authors**	**IS Executive Contribution**
Finalize the deal. Close quickly after setting final terms. Start combining or integrating the two companies.	1. Schweiger, 1987	1. Show IT employees that you are concerned with their welfare, appreciate their loyalty and commitment, and are willing to seek out and point out future opportunities.
	2. Schweiger, Denisi, 1991	2. Communicate with IT employees as soon as possible about all the anticipated effects of the change.
	3. Applegate, Elam, 1992	3. Manage IT human resources.
	4. Applegate, Elam, 1992; Feeny, et al., 1992; Hershey, Eatman, 1990; Moad, 1994a	4. Focus on improving business processes and explaining IT costs in business terms.
	5. Leo, Leifer, 1992	5. Align organizational and IS structure in order to achieve flexibility and efficiency in competitive turbulent environments.
	6. Grover, et al., 1993	6. As "leader" supervise, hire, train and motivate specialized personnel. As an "entrepreneur" ensure that rapidly changing technologies are understood, planned, *implemented and capitalized on* in the organization. As a "resource allocator" decide how to allocate human, financial, and information resources.
	7. Brancheau, et al., 1996	7. Facilitate and manage core business process re-design. Assess the alignment of the IS organization within the enterprise according to M&A changes.
	8. Rockart, et al., 1996	8. Deliver and implement new systems accordingly, build and manage infrastructure, re-skill the IT organization, manage vendor partnerships.

Table 2.4 Support for the IS Teams' Participation Throughout the Merger Phases (Continued)

Integration Phase (Continued)	Authors	IS Executive Contribution
Finalize the deal. Close quickly after setting final terms. Start combining or integrating the two companies.	9. Cliffe, 1999	9. As a leader, provide vision, identify the relationship that will exist between the firms , work with senior managers to create common values, building leadership prospects from within the target firm, forming partnerships building excitement about the company' future.
	10. Breindenbach, 2000	10. Drive the IT integration effort.
	11. Bailey, 2001	11. Manage the IT integration risk. During staging and planning, establish an IT merger team, assess the technology portfolio, open lines of controlled communication, develop an integrated implementation plan based on business strategies, work process and system needs, and synergy targets. During last phase of integration, focus on maintaining operations and achieving stated synergies by retaining key people, completing knowledge capture, and consolidating IT operations.
	12. Connor, 2001	12. Implement the transfer and combination of knowledge for the IT organization, ensuring that knowledge-based assets, or people, do not get lost in the transition
	13. Larsson, Lubatkin, 2001	13. Aid to mitigate resistance among IT resources, address potential culture clash among acquired IT resources.
	14. Larsson, et al., Sweet, 2001	14. Develop action plan to manage minimizing the potential intangible losses such as experience/memory, motivation, commitment, and competence found in people.
	15. Popovich, 2001	15. Gather information on benefits packages of IT people, the structure of the IT organization, and the technology portfolio. Establish an IT merger leadership team to assess the technology portfolio, open lines of controlled communication, and develop an integrated implementation plan based on business strategies, work process and system needs, and synergy targets. Focus on maintaining operations and achieving stated synergies by retaining key people, completing knowledge capture, and consolidating IT operations.

Table 2.4 Support for the IS Teams' Participation Throughout the Merger Phases (Continued)

Integration Phase (Continued)	Authors	IS Executive Contribution
Finalize the deal. Close quickly after setting final terms. Start combining or integrating the two companies	16. Culick, 2002	16. Be an integration champion, ensuring that people issues are addressed throughout the process.
	17. Datta, 1991; Schneider, 2003	17. Identify and manage leadership style clashes among the two firm's IT groups.
	18. Brown, et al., 2003	18. Conduct full disclosure and comparative analysis of the relevant systems. Ensure that information is freely shared and change processes as needed for faster response to current demands.
	19. Krishnan, Park, 2003	19. Facilitate the integration between the two firms and help direct the combined organization towards desired goals, specifically those impacted and related to IT.

This analysis (Chapter 2, Table 4) is one of the major contributions from this study to the merger and IS research field. It provides the foundation for future researchers interested in developing a measurement tool to assess IS teams' participation throughout the different phases of the merger lifecycle. Future research efforts could result in a measure of IS participation throughout the merger lifecycle, similar to the one developed by Barki and Hartwick (1994) to measure user *participation* during the system development lifecycle.

In summary, the studies analyzed in the literature review (Chapter 2, Table 4) support the IS teams' participation throughout the merger phases in the following order, from strongest to weakest support (Chapter 2, Figure 2): integration phase—19 references; strategy phase—11 references; evaluation phase—7 references; planning phase—2 references; and acquisition phase—2 references. These are further explained below.

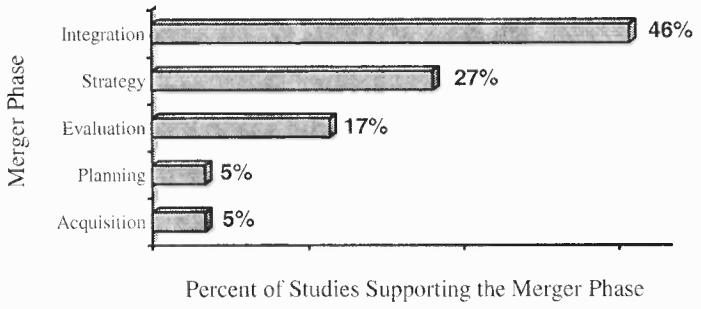


Figure 2.2 Support for the IS teams' participation in merger lifecycle.

The strongest support for the IS teams' participation in the merger lifecycle occurs at the *integration phase*, which is not surprising, but reaffirming. A major component of integrating two firms includes the evaluation, planning, and potential integration surrounding front-end and back-end systems, computer networks, telecommunications, IT operations, and other IT infrastructure. During the integration phase, many of the authors focus on the importance of good leadership and attention to the human component of the integration process, outlining many different ways in which the IS teams could mitigate the IS human resource risks inherent in mergers.

Support for the IS teams' participation in the *strategy phase* is also strong. The focus at this stage is on strategic issues, such as the types of businesses the firm should be in, as well as activities associated with planning, reaching, and sustaining IS-business strategic alignment.

Although not as strong as the support in the strategy phase, the studies' support for the IS teams' participation in the *evaluation phase* is moderately strong. The support is associated with due diligence-type tasks, such as identifying potential synergies, gathering IS relevant information from the target in order to identify risks, and

communicating realistic expectations regarding the potential IS cost associated with the integration.

Support for the IS teams' participation in the *planning phase* is scarce. Note that this is referring to the merger planning phase, not IS integration planning. Some of the activities identified in the planning phase are related to affecting the selection of targets and aiding in estimating a price bid by providing the IS perspective as it relates to potential integration issues with the selected candidate targets. In cases where firms are mainly driven by IT, the IS team activities in the merger planning phase could be significant in terms of affecting the selection of potential targets.

Due to the continuation of the due diligence activities in the *acquisition phase*, the literature that supports the IS teams' participation in the due diligence activities of the evaluation phase, also support participation in the acquisition phase.

The literature analysis suggests that there is great disparity or gap between how the IS teams are currently participating throughout the merger lifecycle and how it is suggested that they participate. In future research, the researcher suggests validating the accuracy of this analysis while developing a measurement tool for IS teams' participation through the merger lifecycle and its ultimate correlation to integration success and merger success.

Chapter 2 has summarized the M&A literature that is relevant to this study. From the chapter, one gleans that there are many different motives driving mergers and that those motives influence the post-merger IS integration strategies and the degree of IS integration required. One also learns that the IS team could potentially play a big role throughout the merger lifecycle, as evidenced by the literature that supports the team's

participation. Furthermore, the literature references indicate that while evaluating mergers and their performance, the role of the IS integration in influencing merger performance has been neglected. Given that so many mergers fail to achieve their intended objectives, and that failure to successfully integrate the firms has been associated with such failure, this research topic is timely and valuable to the IS field by helping to explain sources of IS integration performance.

Successfully integrating the merging firms has been associated with overall merger success. As a component of the overall integration, the technology integration is important to merger success. This study uncovers influential, controllable, organizational and information systems factors that impact post-merger IS integration success, and provides helpful insights about the role of those factors, so that management teams can manage and monitor them more closely during the post-merger technology integration process.

CHAPTER 3

CONCEPTUAL MODEL AND HYPOTHESES

The main objective of this chapter is to introduce the body of literature that supports the study's conceptual model, from which the research hypotheses is derived.

3.1 Relevant Previous Work

3.1.1 Post-Merger Integration

Schweizer (2005) indicates that research on the post acquisition integration process is built on the premise that value creation takes place after acquisitions (Haspeslagh, Jeminson, 1991) and that integration design has an important influence on the ultimate success or failure of an acquisition (Pablo, 1994). The issue of post-merger integration is still viewed as lacking sufficient rigorous empirical research (Bower, 2001; Inkpen, et al., 2000; Larsson, Finkelstein, 1999), despite the growing number of studies analyzing the different challenges of post-merger integration, such as speed (Kitching, 1967; Schweiger, Walsh, 1990), organizational fit (Chatterjee, et al., 1992; Datta, 1991), and executive management turnover during the merger transition (Wash, 1988, 1989). The failure rate that many, if not most mergers experience (Sirower, 1997), can be seen as a symptom of the lack of adequate empirical research, which in turn may lead to the conclusion that existing integration approaches and typologies (Buono, Bowditch, 1989; Haspeslagh, Jeminson, 1991; Marks, Marvis, 1998; Nahavandi, Malekzadeh, 1988; Napier, 1989) fail to address the complexity of the post-acquisition integration process.

Schweizer (2005) also highlights that although the collective results of these studies provide critical insight into post-acquisition success factors, they tend to offer a one-size-fits-all solution. In view of the high failure rate of mergers, there seems to be a clear need to look at more varied integration approaches. Schweizer (2005) believes that it may be necessary to combine different approaches in one integration process, depending on the motives, the industry sector and company characteristics, and the functions and stages of the value added activities, or value chain, to be integrated. While much of the research has addressed a variety of merger problems, researchers have failed to link these integration problems to the motives for mergers or the types of resources being acquired (Ranft, Lord, 2002). Instead, existing research tends to lump together all types of mergers (Bower, 2001). In so doing, existing research tends toward overgeneralization and oversimplification when dealing with mergers (Schweizer, 2005). Thus, existing research only provides a limited and insufficient understanding of this multidimensional phenomenon (Pablo, Javidan, 2004). Realistically, in any given merger, the combined firm will choose multiple levels or types of integration. As long as scholars limit themselves to categorizing integration approaches with single types of variables, the complex post-merger processes cannot be fully captured (Schweizer, 2005). Given that mergers have multiple motives (Bower, 2001) and that the merger process is very complex (Robbins, Stylianou, 1999), applying only one single integration approach when integrating an acquired company severely limits the understanding of this complexity.

To avoid overgeneralization and oversimplification of the empirical research results, this research captures some of the merger complexities presented by Schweizer

(2005). As discussed in Chapter 2, merger motives are among the drivers of the post-merger IS integration strategies selected. The IS integration strategies determine the extent of integration that is required between the merging firms' IS. In this study, and based on the literature review, the researcher views the degree of IS integration as a moderator variable between the independent variables, organizational and IS factors, and the dependent variable, post-merger IS integration success. As indicated earlier, a moderator variable is a "qualitative (e.g., sex, race, class) or quantitative (e.g., level of reward) variable that affects the direction and/or strength of the relation between an independent or predictor variable and a dependent or criterion variable" (Baron, Kenny, 1986). While this study does not directly measure the effect of IS integration strategies nor the merger motives, it acknowledges that not all mergers are alike by considering in the Conceptual Model the post-merger degree of IS integration required.

3.1.2 The Dependent Variable: IS Integration Success

This section reviews the DeLone and McLean IS Success Model, which makes two important contributions to our understanding of IS success. First, it provides a scheme for classifying the multitude of IS success measures that have been used in the literature into six categories. Second, it suggests a model of interdependencies between these categories (Seddon, et al., 1994). Then, this section introduces the multi-dimensional IS integration success construct developed and validated by Stylianou et al. (1996) and Robbins and Stylianou (1999) to measure IS integration success and also to be operationalized in this study. The DeLone and McLean IS success model discussion

helps to explain the rationale for the use of the multi-dimensional and organizational focus of the measure of IS integration success.

IS success has been studied extensively in the literature, resulting in nearly as many measures as there are studies (DeLone, McLean, 1992). This is understandable considering that "information," as the output of an information system or the message in a communication system, can be measured at the technical, semantic, or effectiveness level (DeLone, McLean, 1992). Shanon and Weaver (1949) defined the technical level as the accuracy and efficiency of the system which produces the information, the semantic level as the success of the information in conveying the intended meaning, and the effectiveness level as the effect of the information on the receiver.

Based on theoretical and empirical IS research conducted in the 1970's and 1980's, in 1992, DeLone and McLean (1992) introduced an integrated view of IS success, abbreviated as the "D&M IS Success Model" (Chapter 3, Figure 1). The model provides a scheme for classifying IS success measures that have been used in the literature into six categories: 1) *system quality*—the characteristics of the information system itself which produces the information; 2) *information quality*—characteristics such as accuracy, meaningfulness, and timeliness; 3) *use* and 4) *user satisfaction*—the interaction of the information product with its recipients, the users and/or decision makers; 5) *individual impact*—the influence which the information product has on management decisions; and 6) *organizational impact*—the effect of the information product on organizational performance. Using the Shannon and Weaver (1949) framework, in the D&M IS Success Model, system quality is used to measure technical success, information quality to measure semantics success, and use, user satisfaction,

individual impacts, and organizational impacts to measure effectiveness success (DeLone, McLean, 2003).

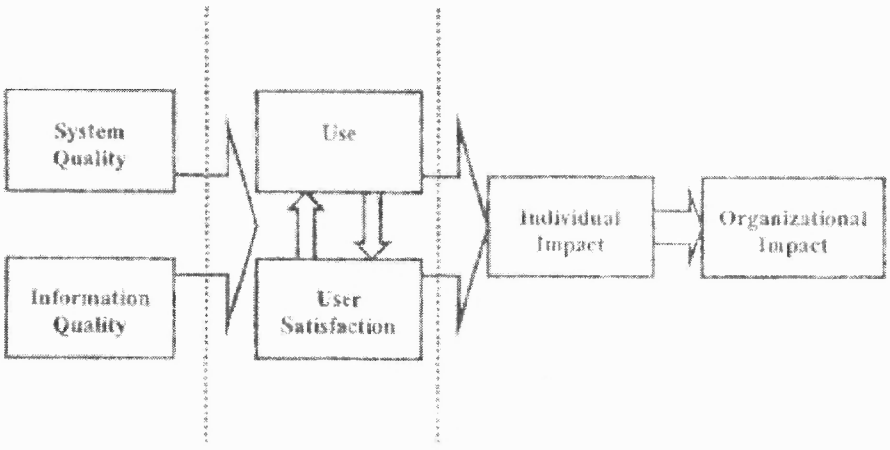


Figure 3.1 D&M IS success model.
Source: DeLone, McLean (1992)

Before the D&M IS Success Model, authors applying different empirical contexts (lab, case, field studies) used different dimensions of the Model to measure IS success: system quality (e.g., Bailey, Pearson, 1983; Conklin, et al., 1982; Mahmood, 1987; Srinivasan, 1985); information quality (e.g., Bailey, Pearson, 1983; King, Epstein, 1983; Rivard, Huff, 1985); use (e.g., Green, Hughes, 1986; Baroudi, et al., 1986; Hogue, 1987; Zmud, et al., 1987); user satisfaction (e.g., McKeen, 1983; Barti, Huff, 1985); individual impact (e. g. Crawford, 1982; Bergeron, 1986; Dickson, et al., 1986); organizational impact (e.g., Lucas, Nielsen, 1980; Rivard, Huff, 1984; Johnston, Vitale, 1988).

In addition to classifying the measures of IS success into six categories, the D&M IS Success Model also depicts the interrelations or interdependence between the IS success dimensions. This model suggests that the IS is first created containing various features that exhibit various degrees of system and information quality. Next, users and

managers experience these features by using the system and are either satisfied or dissatisfied with the system or its information products. The impact the use of the system and its information products has on the individual user performing his or her work then collectively results in organizational impacts (DeLone, McLean, 2003).

In 2003, based on ten years of contributions and approximately 300 articles and refereed journals that applied, validated, or challenged the 1992 D&M IS Success Model, DeLone and McLean introduced some refinements to the model—Chapter 3, Figure 2 (DeLone, McLean, 2003). Although much time has passed since the Shannon and Weaver (1949) framework, and Mason's (1978) extensions to it, the framework, which looks at IS success from the technical, semantic, or effectiveness level, appears as valid in 2003 as it did when the D&M IS Success Model was adopted in 1992 (DeLone, McLean, 2003). The 2003 model takes into account the advent and growth of e-commerce and adds the *service quality* dimension to the *system quality* and *information quality* dimensions of IS success. Each of these quality dimensions will have different weights depending upon the level of analysis (DeLone, McLean, 2003). To measure the success of a single system, information quality or system quality may be the most important quality component. To measure overall success of the IS department, service quality may become the most important variable (DeLone, McLean, 2003).

In addition to introducing the service quality dimension, the 2003 D&M IS Success model consolidates the individual and organizational impact dimensions into a *net benefits* dimension. To keep the model simple, *net benefits* captures impact measures—such as work group impacts, inter-organizational and industry impacts, consumer impacts, and societal impacts—in a single category (DeLone, McLean, 2003).

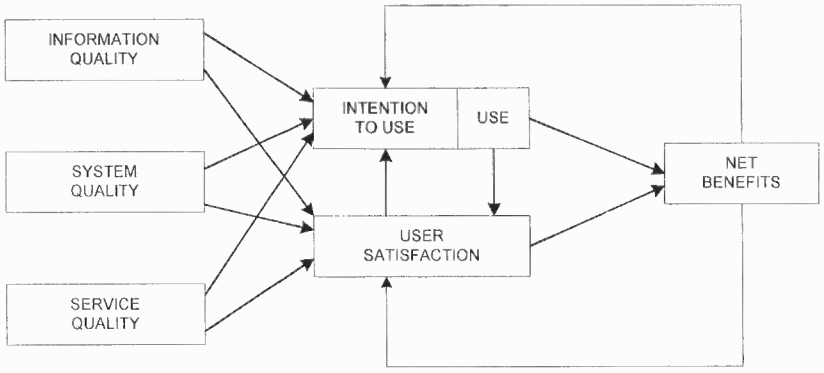


Figure 3.2 Updated D&M IS success model.
Source: DeLone, McLean (2003)

Since 1992, several studies have developed and tested survey instruments which measure one or more of the six success constructs in the D&M IS Success Model. Mirani and Lederer (1998) developed and tested a 33-item instrument to measure organizational benefits derived from IS projects. Their measurement framework consisted of three categories of organizational benefits: strategic, informational, and transactions. Martinsons et al. (1999) proposed a balanced IS scorecard, which is an adaptation of Kaplan and Norton's (1996) Balance Scorecard (BSC). The proposed BSC includes a business-value measurement dimension, a user-orientation dimension, an internal-process dimension, and a future-readiness dimension. The authors then suggest specific measures for each IS BSC dimension. For example, for the business-value dimension, they suggest using the measures cost control, revenue generation, strategic alignment, and return on investment. Torkzadeh and Doll (1999) developed a four-factor, 12-item instrument that measures the individual impact of IS. The dimensions include task productivity, task innovation, customer satisfaction, and management control. Jian and Klein (1999) used a 24-item impact measurement instrument which

assessed system impacts across three types of systems: transactional processing systems, information reporting systems, and decision support systems.

As of the summer of 2002, 285 refereed papers and journals and proceedings referenced the D&M IS Success Model between the period 1993 to mid 2002 (DeLone, McLean, 2003). While many of the articles tended to justify their empirical measure of IS success by citing the D&M IS Success Model, some researchers used the model to support their chosen success variables, rather than to inform the development of a more comprehensive IS success construct (DeLone, McLean, 2003). The main conclusions of the DeLone and MacLean (1992) article was that IS success is a multidimensional and interdependent construct and that it is necessary to study the interrelationships among, or to control for, those dimensions (DeLone McLean, 2003). Researchers should systematically combine individual measures from the IS success categories to create a comprehensive measurement instrument (DeLone McLean, 1992).

Several researchers have commented on the difficulty of applying the D&M IS Success Model in order to operationalize IS success in specific research context (DeLone, McLean (2003). Jiang and Klein (1999) found that users prefer different success measures depending on the type of system being evaluated. Whyte et al. (1997) found that differences deriving from organizational, user, and systems variations can modify the view as to which success measures are important. In reviewing IS success measures, it is obvious that no single measure is intrinsically better than another, so the choice of success variable is often a function of the objective of the study, the organizational context, the aspect of the information system which is addressed in the study, and the level of analysis, i.e. individual, organization, or society (Markus, Robey, 1988).

In this dissertation study, the objective is to assess the impact of the manageable organizational and IS factors on the effectiveness of the IS integration after the merger. The objective is not to measure the effectiveness of a particular information system, but rather to assess overall success of the IS integration at the organizational level, and from the perspective of the management team. Within this context, it is reasonable to adopt post-merger IS integration success measures that correlate to the "net benefits" dimension of the 2003 D&M IS Success Model. The net benefits dimension of the 2003 D&M IS success model measures the "effectiveness level" of IS success. In this case, the net benefits dimension measures the effect of the IS integration on the receiver, in this study the receiver being the management team. Because this study is not evaluating an individual information system, the dimensions preceding the net benefits dimension in the 2003 D&M IS Success Model, system quality, information quality, use, and user satisfaction, are not relevant.

The validated, multi-dimensional construct for *IS integration success* operationalized by Stylianou et al. (1996) and Robbins and Stylianou (1999), and to be used in this study, focuses on the organizational level of analysis and the net benefits dimension from the perspective of the IS management team. The measures include *improved IS capability outcomes*, *IS contribution to the overall merger schedule and merger budget*, *IS ability to exploit opportunities and avoid problems arising from the merger*, *IS resource utilization* (time, personnel, and financial resources) during the integration process, and *perceived IS integration success*. The *improved IS capability outcomes* success measure reflects the improved IS capabilities that exist post-merger as

a result of the IS integration effort. This measure uses 12 items that assess the impact of the IS integration on the ability of the IS function to:

1. Enhance the organization's competitive position (by market share increase, profit increase, etc., attributable to the IS function)
2. Shape or enable critical business strategies
3. Integrate IS planning with organizational planning
4. Provide integration of related technologies across organizational units
5. Provide corporate-wide information accessibility
6. Provide good quality information (accurate, useful, timely, etc.)
7. Contribute to overall organizational financial performance (as measured by return on investment, return on assets, etc.)
8. Manage its own financial performance (meeting budgets, controlling systems maintenance cost, etc.)
9. Operate systems efficiently by ensuring systems availability, reliability and responsiveness
10. Develop systems efficiently and effectively (on time, within budget, satisfying requirements, etc.)
11. Recruit and maintain a technically and managerially competent staff
12. Identify and assimilate new technologies

The *IS contribution to the overall merger schedule and merger budget* measure relies on two items to assess the contribution of the IS integration activities to two components of the overall merger plan: the schedule—staying on track or causing delays, and the budget—staying under or at the planned budget or going over the budget. Similarly, the *IS ability to exploit opportunities and avoid problems arising from the merger* measure relies on two items to assess IS teams' ability to take advantage of opportunities generated after the merger and prevent problems that could have arisen from the merger. The *IS resource utilization* measure employs three items to assess IS integration success in terms of how efficiently the IS resources (time, personnel, and financial) were utilized during the integration process. Finally, the *perceived IS*

integration success measure directly assesses the respondent's perceived level of IS integration success achieved during the integration.

3.2 Conceptual Model

The literature reviewed above concerning the factors that influence information systems integration success highlights several important points regarding these factors. First, the factors may be categorized in terms of their manageability, i.e. those which can be manipulated in the context of an IS integration (e.g., level of executive management support), and those that can not (e.g., company merger experience). Because the intention is to identify factors that can be shaped and influeced by management teams, this study focuses only on manageable factors. Second, the factors may also be categorized into organizational factors, i.e. factors within the context of the entire organization (e.g., quality of merger planning), and information systems factors, i.e. factors specific to the context of the IS integration process (e.g., quality of IS integration planning). Third, within the organizational and information systems categories, analysis concerning the relationship between some of these factors and some of the IS integration success measures found their relationship to be significant (Stylianou et al., 1996; Robbins, Stylianou, 1999). Fourth, academic as well as practitioner literature that describes factors that influence successful information systems projects also supports the importance and influence of these controllable factors (Chapter 3, Table 1).

An in-depth review of the literature (Chapter 3, Table 1) is shown to corroborate and inform the conceptual model. Using relationships reported in the literature, factors were organized into the model shown in Chapter 3, Figure 3. The organization and

information systems factors (independent variables) were originally introduced in Chapter 1. In Chapter 3, Section 3, the author further elaborates on each of these factors and the research hypotheses are developed.

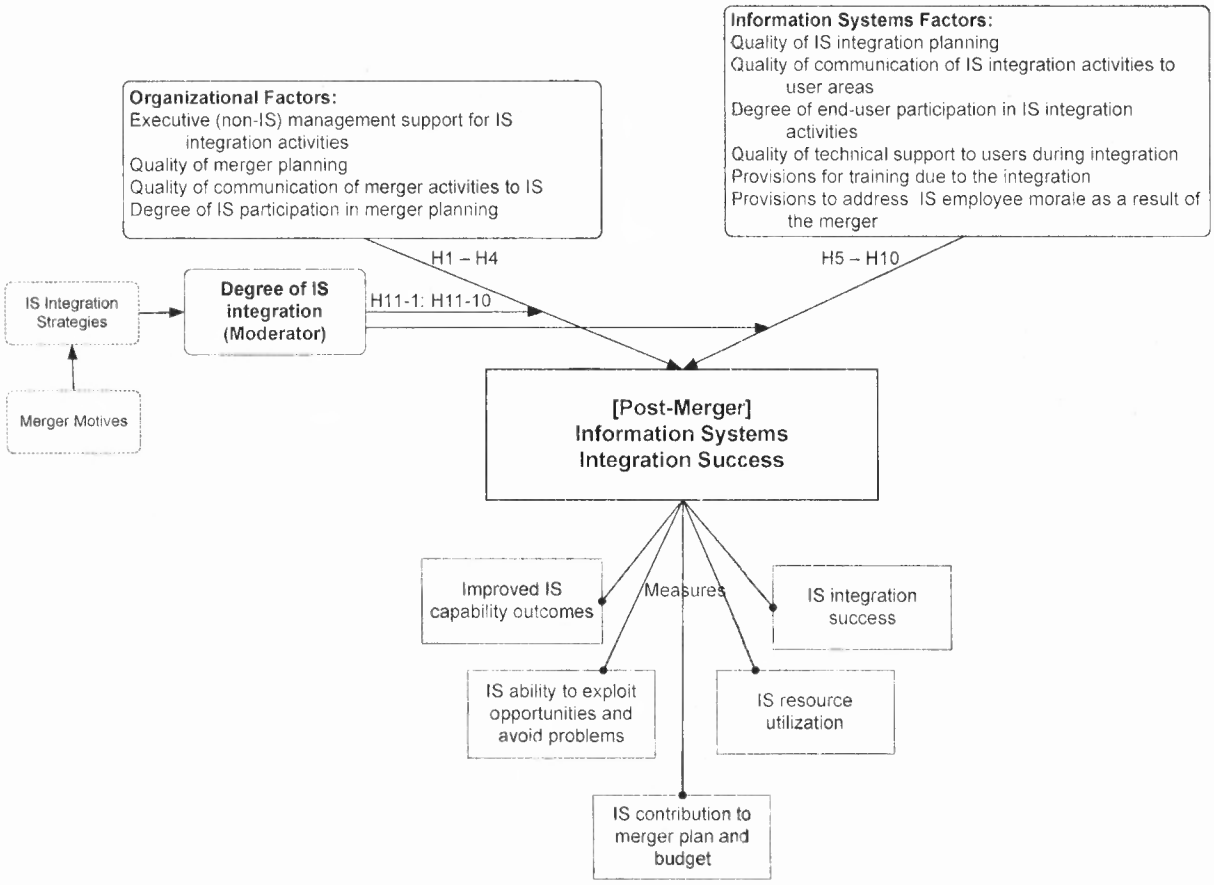


Figure 3.3 Conceptual Model.

3.3 Independent Variables: Organizational and IS Factors

As indicated earlier, after a careful review of the literature, the four organizational and six IS factors outlined in the Conceptual Model were selected based on their prominence across various information systems contexts, their relevance to a post-merger IS integration, and the ability of management teams to manage them. In selecting these factors as a focus for this study, it is imperative to understand that many other factors may influence IS integration success. However, the ones selected in this study have been acknowledged to be important in a variety of information systems contexts, are relevant to an IS integration, and most importantly can be controlled by management teams. This means that the management teams have some influence over how the factors are manifested in the post-merger environment. For example, the first organizational factor, executive (non-IS) management support, is a factor over which the executive management team has free reign. They can, if so desired, make this factor manifest itself in the post-merger environment, or not. Similarly, the first IS factor, quality of IS integration planning, is a factor for which the IS management team can decide or choose to implement a high or low level quality IS integration plan.

Factors which the management team cannot influence are excluded from this study, even though they may be important for IS integration success. For example, company merger experience is an organizational factor that has been associated with merger performance (Haleblian, Finkelstein, 1999; Hitt, et al., 1993; Bruton, et al., 1989), however, a management team has no influence over the number of years of merger experience the merging companies have. Similarly, level of data sharing across systems is an IS factor that has been associated with IS integration success (Stylianou, et al.,

1996). Unfortunately, the management team cannot choose the level of data sharing that is manifested in the post-merger environment.

This study aims at identifying factors than influence IS integration success and which can be controlled by management teams. The management teams can then focus on these and facilitate effective IS integrations, impacting merger integration success, and ultimately facilitating overall merger success. Chapter 3, Table 1 summarizes the literature that supports the selection of the organizational and IS factors included in the Conceptual Model.

Table 3.1 Organizational and IS Factors – Literature Support

Organizational Factors	**IS Context**	**Authors**
Executive (non-Is) management support	1. Development and management of IS 2. Data Warehousing projects 3. Expert systems projects 4. System development projects 5. Integration of computer-aided design/computer-aided manufacturing systems with resource planning 6. Runaway projects 7. IS integration leadership 8. Implementation of IS innovations 9. Merger IS integrations	1. Jarvenpaa, Ives, 1991 2. Wixon, Watson, 2001 3. Yoon, et al., 1995 4. Lee, 1986; Leitheiser, Wetherbe, 1986 5. Soliman, et al., 2001 6. Mahaney, Lederer, 1999 7. Schweiger, et al., 1987; Brown, et al., 2003; Datta, 1991; Choi, Chan, 1997; Robbins, Stylianou, 1999 8. Jarvenpaa, Ives, 1991; Kwon, Zmud, 1987; Leonard-Barton, Deschamps, 1988; Purvis et al., 2001; Sharma, Yetton, 2003 9. Stylianou, et al., 1996

Table 3.1 Organizational and IS Factors – Literature Support (Continued)

Organizational Factors	**IS Context**	**Authors**
Quality of merger planning	1. Software project risk management 2. Merger IS integrations	1. Haspeslagh, Jeminson, 1991; Aiello, Watkins, 2000; Wallace, Keil, 2004 2. Massimilian, 2001; Robbins, Stylianou, 1999; Larsson, et al. 2001
Quality of communication of merger activities to IS	1. Collaborative software development 2. Business/IS alignment 3. Improved team understanding 4. Merger IS integrations	1. Mohtashami, et al., 2006 2. Reich, Benbasat, 2000; Boynton, et al., 1994; Rockart, et al., 1996 3. Littlejohn, 1996; Lind, Zmud, 1991 4. Stylianou, et al., 1996
Degree of IS participation in merger planning	1. Business/IS alignment 2. IS participation in business planning 3. IS participation in merger strategy phase 4. Merger IS Integrations	1. Reich, Benbasat, 2000; Zmud, 1988 2. Lederer, Burky, 1988 3. Applegate, Elam, 1992; Grover,, et al., 1993; Earl, Feeny, 1994; Moad, 1994; Rockart, et al., 1996; Kappelman, Windsor, 1997; Stewart, 1998; Luftman, Brier, 1999; Hirschheim, Sabherwal 2001; Popovich 2001; Smaczny, 2001 4. Stylianou, et al., 1996
IS Factors	**IS Context**	**Authors**
Quality of IS integration planning	1. Merger integrations management 2. Software project risk management 3. Merger IS integrations	1. Lajoux, 2006; Vester, 2002; Bailey, 2001; Buck-Lew, et al., 1992; Stylianou, et al., 1996 2. Haspeslagh, Jeminson, 1991; Aiello, Watkins, 2000; Wallace, Keil, 2004 3. Stylianou, et al., 1996

Table 3.1 Organizational and IS Factors – Literature Support (Continued)

IS Factors (Continued)	IS Context	Authors
Quality of communication of IS integration activities to user areas	1. Merger IS integrations 2. Computer-based systems implementations 3. ERP project implementations 4. Merger integrations management 5. Diffusion of innovations 6. IS integration leadership	1. Robbins, Stylianou, 1999 2. De Brabander, Thiers, 1984; Edstrom, 1977 3. Nah, Delgado, 2006 4. Breindenbach, 2000; Bailey, 2001 5. Ebadi, Utterback, 1984; Chakrabarti, et. Al., 1983; Allen, et al., 1979; Hauptman, 1986; Nilakanta, Scamell, 1990 6. Brown, et al., 2003; Krishnan, Park, 2003
Degree of end-user involvement in IS integration activities	1. Systems development/Software engineering projects 2. Planned organizational change theory 3. Merger IS integrations	1. Lucas, 1974; Gibson, 1977; Keen, 1981; Robey, Farrow, 1982; Markus, 1983; Jiang, et al., 2002; Clavadetscher, 1998; Gallivan, Keil, 2003; Newman, Sabherwal, 1996; Hunton, Beeler, 1997; Hwang, Thorn, 1999; Doll, Torkzadeh, 1989; Mann, Watson, 1984; Athey, Zmud, 1986; Meador, Mezger, 1984 2. Ives, Olson, 1984 3. Robbins, Stylianou, 1999
Quality of technical support to users during the IS integration	1. Systems use 2. Information satisfaction	1. Fishbein, Ajzen, 1975; DeLone, McLean, 1992; Karahanna, et al., 1999 2. Joshi, Bostrom, 1986; Bailey, Pearson, 1983; Ives, et al., 1983

Table 3.1 Organizational and IS Factors – Literature Support (Continued)

IS Factors (Continued)	IS Context	Authors
Provisions for training due to integration	1. End-user computing 2. End-user education level 3. Computer self-efficacy 4. User perceptions & attitudes 5. Perceived ease of use 6. Usage 7. End-user acceptance	1. Dickson, et al., 1984; Zmud, Lind, 1985; Hartog, Herbert, 1986; Harrison, Rainer, 1992; Cheney, et al., 1986; White, Christy, 1987; Brancheau, Wetherbe, 1987; Rivard, Huff, 1988; Sein, et al., 1987 2. Davis, Davis, 1990; Igbaria, Parasuraman, 1989; Lucas, 1978 3. Compeau, Higgings, 1995; Hill, et al., 1987; Burkhardt, Brass, 1990, Gist, et al., 1989; Webster, Martocchio, 1992, 1993 4. Venkatesh, 1999; Raymond, 1990 5. Venkatesh, Davis, 1996 6. Schewe, 1976; Fuerst, Cheney, 1982; Lee, 1986; DeLone, 1988; Igbaria, et al., 1989; Kraemer, et al., 1993) 7. Cronan, Douglas, 1990
Provisions to address IS employee morale as a result of the merger	1. Mergers – resistance 2. Mergers – managers turnover 3. Mergers – decline in shareholder value 4. Mergers – deterioration in operating performance 5. Mergers – intangible losses 6. Mergers – anxiety 7. Empowerment	1. Buono, et al., 1985; Sales, Mirvis, 1984 2. Hambrick, Canella, 1993; Lubatkin, Schweiger, Weber, 1999 3. Chatterjee, Lubatkin, Schweiger, 1992 4. Very, et al. 1997; Weber, et al., 1996 5. Larsson, et al. 2001 6. Ashford, et al., 1989; Buono, et al., 1985; Marks, Mirvis, 1983; Robino, DeMeuse, 1985; Schweiger, Ivancevich, 1985; Shirley, 1973 7. Dunker, 1994

The remainder of this chapter expands on each of the factors and derives the hypotheses based on findings that signal how the factors may impact post-merger IS integration success.

3.3.1 Organizational Factors

Executive (non-IS) management support for IS integration activities. Executive management support refers to the extent to which the senior business management team supports IS integration related activities. In this study, executive support is meant to encompass both executive participation and involvement, two distinct constructs as described by Barki and Hartwick (1989), which define participation as the behaviors and activities performed, and involvement as a subjective psychological state. In this study, executive participation is used to refer to the activities or substantive personal interventions of the CEO and the executive team in the management of the IS integration. Such behaviors can vary from chairing an executive IS integration steering committee, requesting or scanning IS integration progress reports, or approving a new, corporate-wide information system, as a result of the merger. Executive involvement in the IS integration, on the other hand, is concerned with the psychological state of the CEO and the executive management team, reflecting the degree of importance placed on the IS integration by the chief executive and direct reports. It does not require the executive team to take a hands-on role in managing the IS integration, rather, it requires that the executive team view IS as contributing to the overall merger integration success (adapted from Jarvenpaa, Ives, 1991). Based on the literature, executive support has been found to

have a positive influence on the development of IS projects, IS innovations, and overall success of IS projects.

Executive management support has been found to be a positive influence in the development and implementation of management information systems (Jarvenpaa, Ives, 1991), data warehousing projects (Wixon, Watson, 2001), expert systems projects (Yoon, et al., 1995), system development projects (Lee, 1986; Leitheiser, Wetherbe, 1986), and integration of computer-aided design/computer-aided manufacturing systems with resource planning systems (Soliman, et al., 2001). It has also been found to be significant in the context of runaway projects (Mahaney, Lederer, 1999). Executive support has also been recognized as being important, as a component of IS integration leadership (Schweiger, et al., 1987; Brown, et al., 2003; Datta, 1991).

IS researchers have examined the effect of a wide range of factors on successful implementation, and have identified management support as a critical factor, particularly in the implementation of IS innovations (Jarvenpaa, Ives, 1991; Kwon, Zmud, 1987; Leonard-Barton, Deschamps, 1988; Purvis et al., 2001). The research argues that management support is critical because the implementation of IS innovations is resource intensive. Substantial material and management resources are required to not only develop IS applications and infrastructures, but also to support end-users during implementations. Such resources are more likely to be forthcoming when the change enjoys management support (Sharma, Yetton, 2003). In addition, symbolic actions of support by senior managers contribute to successful implementation. These actions legitimize IS innovations, signal management commitment to successful implementation, and serve to convince end-users to expand the effort required to adopt innovations

(Leonard-Barton, Deschamps, 1988; Purvis et al., 2001). Such action could be in the form of visible association with the project, active championship, organizational communications, or personal use of technologies (Leonard-Barton, Deschamps, 1988; Rai, Howard, 1994; Rai, Patnayakuni, 1996).

An IS integration effort after a merger shares similar characteristics with the implementation of an IS innovation. IS integrations are resource intensive, requiring resources to evaluate information systems across merger companies, devise an integration plan based on the motives of the merger, and work with different business and technology teams to implement the integration plan. During IS integrations resulting from a merger, as with IS innovations, the users must also be supported to ensure that their needs are met and that they are able to perform their daily functions with the least interruption. Symbolic actions by senior management would also seem to give legitimacy to an IS integration, indicating that management is committed to a successful IS integration implementation, and may serve to convince users to expend the effort that is required from their part to adopt the information systems resulting from the IS integration effort.

When senior management becomes involved in projects, it provides sponsorship, hands-on leadership, and commitment to the project. A senior management team that provides support is personally engaged in the process (Al-Mashari, Zairi, 1999), and actively provides information, material, and resources, as well as political support (Wixon, Watson, 2001). In addition, a supportive senior management team establishes strategic direction, and motivates the organization to change (Choi, Chan, 1997). All these actions would contribute to the successful completion of a IS integration project

after a merger. Executive non-IS management support of IS integration activities signals to the organization the importance of IS integration, and in turn helps the IS team to create a positive integration environment (Robbins, Stylianou, 1999). Thus, the following hypothesis regarding senior business management support is proposed:

H 1:	*Executive (non-IS) management support for IS integration activities influences post-merger IS integration success measures, such that greater executive (non-IS) management support for IS integration activities results in greater post-merger IS integration success measures.*

Quality of merger planning. Quality of merger planning refers to the quality of the merger plan. A quality merger plan identifies and addresses risks associated with the merger. It also facilitates successfully combining the firms and achieving the merger goals.

One of the key activities during merger planning is identifying the details critical to the deal's success (Haspeslagh, Jeminson, 1991; Aiello, Watkins, 2000), which helps to identify and manage risks associated with the merger. Risks are factors that can adversely affect a project, unless project managers take appropriate countermeasures (Wallace, Keil, 2004). In the context of software projects, execution risks, which include risks such as inadequate project staffing, inappropriate development methodology, failure to define roles and responsibilities, and poor project planning and control, have a significant relationship with product outcome. Thus, managers concerned with meeting schedule deadlines and budget limitations must find ways to reduce the risks associated with project execution. The good news is that managers have very high level of control over these risks (Wallace, Keil, 2004). Akin to a software project, a merger is a project

where one of the most desirable outcomes is the successful integration of the firms, based on the original motives of the merger. Project managers are tasked with meeting integration deadlines and budgets. Good merger planning should promote smooth project execution, reducing execution risks, and facilitating a positive integration outcome.

A quality merger plan considers in detail the level of integration required between the firms. It also puts in place the governance structures that would facilitate decisions relevant to the merger, and communicates these structures to the firms (Massimilian, 2001). The plan includes the due diligence activities that should take place pre and post merger, and accounts for the resources required to make the firms' combination possible (Massimilian, 2001). Without taking these into consideration, the merger may not achieve its intended goals. A quality merger plan also takes into account potential sources of merger failure, such as people issues and culture clashes, and puts forth a plan to mitigate these risks ((Buono, et al., 1985).

While merger planning may be considered tedious, time consuming, and often does not include IS professionals, the rewards include the development of systems that support the underlying motives for the merger. The quality of merger planning appears to be an important influence on the success of the integration process, contributing to the ability to exploit merger opportunities while avoiding problems in merging the IS processes (Stylianou, et al., 1996). Quality merger planning can also help mitigate intangible losses associated with a merger, namely losses associated with experience/memory, motivation, commitment, and competence (Larsson, et al. 2001). Therefore, the following hypothesis regarding quality of merger planning is proposed:

H 2:	*Quality of merger planning influences post-merger IS integration success measures, such that greater quality of merger planning results in greater post-merger IS integration success measures.*

Quality of communication of merger activities to IS. Quality of communication of merger activities to IS refers to the quality of communication from business areas to the IS areas regarding merger activities. This type of communication facilitates collaboration between the business and the IS teams and helps these two groups stay aligned.

Collaborative communication is one of the risk factors for collaborative software development projects, which entail multiple teams working for multiple organizational units within the same or different companies, and also one of the three most important factors for collaborative development (Mohtashami, et al., 2006). In this context, effective communication entails sharing both technical information and also policies and common management and development frameworks. This communication adds value and efficiency to collaborative efforts. To be effective, communication must have high information content, must be continuing and bidirectional, and must support personal and business relationships as well as technical content (Mohtashami, et al., 2006). Merger-related integration activities have commonalities with collaborative software development projects. The integration effort requires that multiple business and IS teams work together across organizational units, within the same firm and between merging firms to accomplish integration-related goals. In a merger situation, the parties would be sharing technical data about the information systems they use, expectations about systems required availability, and business plans around those systems impacted by the

merger. The continuous sharing of communication between the user areas and IS teams assists in understanding and meeting user needs and expectations.

The literature provides evidence that communication leads to mutual understanding between business and IS, or alignment (Reich, Benbasat, 2000). Effective application of IS depends on the interactions and exchanges that bind IS and line managers (Boynton, et al., 1994). As communication increases it is more likely that group members will share common ideas (Littlejohn, 1996). Communication ensures that business and IS capabilities are integrated into the business effectively (Rockart, et al., 1996). There is empirical support for the connection between frequency of the communication and convergence in understanding (Lind, Zmud, 1991). Previous research regarding the benefits of communication between business end-users and IS teams suggest the following:

H 3:	*Quality of communication of merger activities to IS influences post-merger IS integration success measures, such that greater quality of communication of merger activities to IS results in greater post-merger IS integration success measures.*

Degree of IS participation in merger planning. Degree of IS participation in merger planning refers to the level to which the IS team takes part in merger planning activities. This participation is conducive to the IS teams achieving the merger objectives throughout the lifecycle of the merger.

IS executives who participate in business planning believe that they have a better understanding of executive management's objectives than those who do not participate (Lederer, Burky, 1988). Evidence exists that the level of alignment is influenced by

connections between business and IS planning processes (Reich, Benbasat, 2000; Zmud, 1988). Planning activities occur throughout the lifecycle of a merger. As discussed in detail in Chapter 2, Section 2.7, and summarized in Chapter 2, Table 4, a review of the literature supports the need for participation of IS teams throughout the merger lifecycle, including the strategy, planning, evaluation, acquisition, and integration phases of the merger.

IS participation in high quality merger planning was found to be an important contributor to the success of the integration process, contributing to the ability to exploit merger opportunities while avoiding problems in merging the IS processes (Robbins, Stylianou, 1999). Collectively, the outcomes from IS teams participating in merger planning suggest:

H4:	*Degree of IS participation in merger planning influences post-merger IS integration success measures, such that greater degree of IS participation in merger planning results in greater post-merger IS integration success measures.*

3.3.2 Information Systems Factors

Quality of IS integration planning. Quality of IS integration planning parallels the organizational independent variable *Quality of Merger Planning*, and refers to the quality of the IS integration planning activities. IS integration planning helps improve the IS integration outcomes.

A post-merger integration plan outlines exactly when and how the major resources, assets, processes, and commitments of the merging companies will be combined in order to achieve the strategic goals of the newly combined company

(Lajoux, 2006). Acquirers should follow the classic wisdom of project planning: prepare to plan, assess the current environment, define integration plan objectives, develop plans and identify resources, and validate the plan (Lajoux, 2006). Despite the evidence that most acquisitions fail to add value to the acquirer, an acquisition could be successful by following a disciplined integration program based upon best practices (Vester, 2002). A solid strategic foundation that explains the reason for the deal is the correct place to start customizing the integration process in order to capture maximum value (Vester, 2002). After this process is created, it should be followed rigorously, keeping in mind that speed is essential, and quality is paramount (Vester, 2002). Excellence at each phase of the integration cumulatively increases the odds of overall success (Vester, 2002).

After a merger contract is finalized, the IT departments are often expected to consolidate the systems as quickly as possible with minimal disruption to the business (Wijnhoven, et al., 2006), based on the merger motives. If integration is required to meet the merger goals, managing the information technology integration risk associated with a merger is a major component in determining the ultimate success or failure of mergers (Bailey, 2001). However, IS integration is often given insufficient priority in merger discussions, with the management seemingly focusing more on the strategic and organizational compatibility of the two firms and leaving the IS issue to a later state (Buck-Lew, et al., 1992; Stylianou, et al., 1996). To address these challenges successfully, the IS team leaders should present a strong business case for participation in the earliest phase of the merger life cycle. Early participation is essential to set realistic expectations regarding achievement of economies of scale and to define the strategic role

of the IS area in supporting effective business processes with the new organization (Bailey, 2001).

H 5:	*Quality of IS integration planning influences post-merger IS integration success measures, such that greater quality of IS integration planning results in greater post-merger IS integration success measures.*

Quality of communication of IS integration activities to user areas. This independent variable mirrors the organizational independent variable *Quality of communication of merger activities to IS.* It refers to the quality of communication from IS areas to the business areas regarding merger integration activities. In this context, good communication assists in fostering mutual understanding between IS and user areas, reduces end-user dissatisfaction with the ultimate solution, and sets end-user expectations. It may also aid in the adoption of post-merger systems and help achieve the merger goals. Good communication between IS teams and end user areas regarding the progress of the merger activities helps generate understanding and support from the end-user constituency (Robbins, Stylianou, 1999).

An IS integration project resulting from a merger can be compared with system development projects, where the IS teams play the role of the specialists and the user areas the role of system end-users. During the IS integration process, the IS teams aim to implement systems and solutions that fulfill the needs of the new organization. Systems development projects aim at implementing systems that meet the need of the end-users and the organization to which end-users belong. Computer-based systems implementation has focused on identifying factors conducive to success or failure,

including communications between developers and users (De Brabander, Thiers, 1984). Symptoms of ineffective communication between specialists and users are consistently related to user dissatisfaction with the system and this appears to be true for communication problems at all phases of the system development process (Edstrom, 1977). Drawing a parallel, symptoms of ineffective communication between IS teams and end-users may also be related to end-user dissatisfaction with the ultimate solution.

IS integration projects resulting from a merger can also be compared in scope and impact with Enterprise Resource Planning (ERP) project implementations, where communication is critical (Nah, Delgado, 2006). The primary purpose of such communication in an ERP implementation is to set expectations and share goals effectively among stakeholders and throughout all levels of the organization. It should be complete and open to guarantee honesty (Nah, Delgado, 2006). Akin to ERP implementations, IS integration projects resulting from a merger have the potential to impact the entire enterprise. IS teams are encouraged to set stakeholders' expectations (Breindenbach, 2000; Bailey, 2001) and mutually share goals with user areas across the enterprise. This can be accomplished by having open lines of communication between the IS teams and the end-user areas.

In addition, an IS integration process resulting from a merger has commonality with the innovation diffusion process. The process of diffusion of innovation refers to the spread of new technology within a universe of potential adopters. (Rogers, 1982; Thompson, 1965; Pierce, Delbecq, 1977). In the case of an IS integration resulting from a merger, new IS that may be implemented as a result of the integration can be perceived as an "innovation" by new end-users of the IS. Innovation researchers (Ebadi, Utterback,

1984; Chakrabarti, et al., 1983) have noted that diffusion of innovations can be affected by both sources of information and channels of communication. An information source is defined as a medium in which knowledge/information is stored, while a communication channel is defined as a means by which information is moved from one point to another (Chakrabarti, et. Al., 1983). From this perspective, the communication of IS integration activities to the users can be viewed as a communication channel that promotes diffusion of innovations. In theory then, studies indicating the importance of communication for innovation diffusion may also be applicable to the IS integration process. Studies on innovation in research and development organizations have shown the importance of project team communication with both external and internal sources on innovation implementation (Allen, et al., 1979; Hauptman, 1986) Since effective communication is affected by various information sources and channels of communication (Chakrabarti, et. Al., 1983), the characteristics of these sources and channels can influence the diffusion of technical process innovations in organizations (Nilakanta, Scamell, 1990). This suggests that communication by IS integration teams to end users may be an important factor in successful integrations.

IS teams involved in the post-merger IS integration should conduct comparative analysis of the relevant systems and ensure that this information is freely shared (Brown, et al., 2003). They must also ensure that flow of information keeps up with current demands (Brown, et al., 2003). IS teams should help direct the combined organization towards desired goals, specifically those impacted and related to IS (Krishnan, Park, 2003). These goals can be facilitated by high quality communication of IS activities to user areas. Collectively, this literature suggests:

H 6:	*Quality of communication of IS integration activities to user areas influences post-merger IS integration success measures, such that greater quality of communication of IS integration activities to user areas results in greater post-merger IS integration success measures.*

Degree of end-user involvement in IS integration activities. Degree of end-user involvement in IS integration activities refers to the extent to which internal end-users, who would use the information systems resulting from the merger integration efforts, participate in IS-related integration activities. Involvement in this context refers to both participation and involvement, and thus this study does not make a distinction between the two, as discussed earlier under *IS participation in merger planning.* End-user involvement can aid in the development of more relevant solutions, while helping decrease resistance and increase acceptance of the changes resulting from the merger.

In the context of information systems development, which has received considerable attention in the management science and IS literatures (Daniel, et al., 1986), user involvement is a specific application of the management techniques of participative decision making and group problem solving (Ives, Olson, 1984). The common knowledge that user involvement should lead to improved system implementation can also be linked to theory and research in Organizational Behavior, and is particularly relevant to two theories: participative decision-making and planned organizational change (Ives, Olson, 1984). To understand the link, it is necessary to briefly discuss these two theories.

The first relevant theory is participative decision-making. The goal of participative decision making (PDM) is to increase inputs of subordinates into

management decisions that are related to their jobs (Ives, Olson, 1984). Expected benefits include increased job satisfaction and improved productivity (Locke, Schweiger, 1979). User involvement can be considered a special case of PDM in which users and system designers substitute for superiors and subordinates, respectively (Ives, Olson, 1984). User participation in system development is predicted to improve systems by providing a more accurate and complete assessment of user information requirements, providing expertise about the organization the system is to support, avoiding development of unacceptable or unimportant features, and improving user understanding of the system (Lucas, 1974; Robey, Farrow, 1982).

Participation may lead to increased user acceptance by developing realistic expectations about system capabilities (Gibson, 1977), providing an arena for bargaining and conflict resolution about design issues (Keen, 1981), increasing system ownership by users (Robey, Farrow, 1982), decreasing user resistance to change (Lucas, 1974), and committing users to the systems (Lucas, 1974; Markus, 1983).

The second relevant theory is planned organizational change. In this theory, organizational success (i.e. the acceptance and use of new models or information systems) is considered to be dependent on the quality of the implementation process (Ginzberg, 1979; Schultz, Slevin, 1975; Zand, Sorenson, 1975). Adherents view participation as a means for inducing attitude changes which then facilitate organizational change; involvement is seen as a necessary, but not sufficient, condition for decreasing resistance and increasing acceptance of the change (Ives, Olson, 1984).

Traditional software engineering disciplines deem user involvement as key to avoiding software project failure (Jiang, et al., 2002) and key to success (Clavadetscher,

1998). End-user involvement promises more relevant solutions to user problems and greater commitment to those solutions than when systems are developed without user involvement. This not only means improvements in the technical performance of information systems, but also greater acceptance and use (Baroudi, et al., 1986). The IS literature suggests that user participation in software development projects is beneficial (Gallivan, Keil, 2003) because it improves the requirements determination process, leads to greater buy-in, and keeps users informed about progress (Newman, Sabherwal, 1996; Hunton, Beeler, 1997), leading to higher levels of user satisfaction, system quality, and system usage (Hwang, Thorn, 1999). End-user involvement in systems development may improve the quality of design decisions and applications developed, improve end-user skills in system utilization, develop user abilities to define their own information requirements, and enhance user commitment to and acceptance of the developed application (Doll, Torkzadeh, 1989). In an end-user computing environment, user involvement is expected to be particularly important in determining user satisfaction and improving decision making (Mann, Watson, 1984; Athey, Zmud, 1986; Meador, Mezger, 1984).

A parallel can be drawn between the role of user involvement in system development or software engineering projects and user involvement in IS integration activities. An integration after a merger requires a great deal of input from the end-users in terms of determining the IS requirements, assessing user expectations, and obtaining company knowledge, which is usually unavailable within the IS group (Lucas, 1974). In both types of projects, user satisfaction, commitment, and acceptance of the resulting IS is very important. In addition, end-user involvement with merger-related IS integration

activities improves communication (Robbins, Stylianou, 1999). If end-users understand the process and problems associated with merger-related IS integration and are able to provide input, an atmosphere of cooperation is created, allowing the IS department to more readily achieve their objectives (Robbins, Stylianou, 1999). Collectively, the implications from end-user involvement in software engineering projects suggest:

H 7:	*Degree of end-user involvement in IS integration activities influences post-merger IS integration success measures, such that greater degree of end-user involvement in IS integration activities results in greater post-merger IS integration success measures.*

Quality of technical support to users during the IS integration. This manageable variable refers to the level of technical support given to the end-users during the post-merger IS integration. This variable may influence system use and user information satisfaction.

Technical support during the IS integration is important because it may ultimately affect *systems use*, as part of the work networks that affect subjective norm, the person's perception that most people who are important to her think she should or should not perform the behavior in questions (Fishbein, Ajzen, 1975). Empirical evidence suggests that information technology usage is a key dependent variable in MIS research (DeLone, McLean, 1992). A number of studies have examined the effect of perceived usefulness and perceived ease of use on system usage and have found these to be important determinants of self-reported system use (Karahanna, et al., 1999). The study by Karahanna, et al. (1999) found that for users of IS the significant referent groups in order of importance are peers, local computer specialists, executive management, and

supervisors. Local computer experts, falling under the local computer specialist group, are a valuable source of assistance with potential problems and questions with the technology. Sustained IS usage intentions may hinge on the efficacy of this group in providing technical support (Karahanna, et al., 1999).

Technical support to users during the IS integration may also indirectly influence *user information satisfaction*, which has been accepted as a major evaluation criteria for the performance of IS departments and their staff (Joshi, Bostrom, 1986). MIS research has identified three broad factors which influence user information satisfaction (Bailey, Pearson, 1983; Ives, et al., 1983). The first factor, quality of information product, refers to the technical quality of reports and screens generated by the information system. The second factor, attitudes toward IS staff and services, includes items such as time taken for development of new systems and relationship with IS staff. The third factor, the level of user knowledge and involvement, refers to issues such as training and involvement in system design (Joshi, Bostrom, 1986). From these three factors, results indicate that attitudes towards IS staff and services is one the most dominant factors, with a correlation factor to user information satisfaction of .70 (Joshi, Bostrom, 1986). This study argues that technical support may influence user information satisfaction by impacting the second factor, attitude towards IS staff and services. The consequences of dissatisfaction can range from non-usage of the systems to sabotage (Zmud, 1983). By providing high quality technical support to user during the IS integration activities, users and IS staff would enhance their relationship, as users are faced with uncertainties resulting from the potentially new IS and computing environment.

H 8:	*Quality of technical support to users during the IS integration influences post-merger IS integration success measures, such that greater quality of technical support to users during the IS integration results in greater post-merger IS integration success measures.*

Provisions for training due to the integration. This variable addresses the availability of training, or formal efforts to transfer required IS knowledge, to both business users and IS staff as a result of the post-merger integration. Training aids users to understand the software tools they require to perform their jobs, improving their education level and their computer efficacy.

Training plays a very important role in end-user computing (EUC), the practice of end-users developing, maintaining, and using their own information systems (Sein, et al., 1987). End-user training has been identified as a critical factor and the most effective mechanism for ensuring the success of EUC (Dickson, et al., 1984; Zmud, Lind, 1985; Hartog, Herbert, 1986; Harrison, Rainer, 1992). The availability of end-user training programs has also been linked to the success of EUC satisfaction (Cheney, et al., 1986). The success or failure of EUC within an organization will ultimately depend on whether end-users effectively use EUC software (Sein, et al., 1987). Basic and advanced training should be integral elements of any strategy designed to enhance end-user efficiency and effectiveness (White, Christy, 1987; Brancheau, Wetherbe, 1987; Rivard, Huff, 1988). One of the outcomes of an IS integration resulting from a merger may be the introduction of new information systems and processes into the end-user environment. Providing end-user training would ensure that end-users have the know-how and desire to use the new software tools and processes introduced to them as a result

of the integration. Although even the most structured training program will not leave an end-user with a complete mental model of the software, it will leave the end-user with a strong and accurate initial mental model encompassing certain vital and essential part of the software (Sein, et al., 1987). Mental models are then constantly refined and perfected through the user's continuous interaction with the system (Norman, 1986; Owen, 1986).

Training due to the integration may also play a role in enhancing an employee's education level. While education involves an understanding of abstract theory and training pertains to gaining the skills necessary to accomplish a task (Nelson, Cheney., 1987), training can help enhance the user's knowledge base and can increase the user's education related to information systems usage. End-users with higher levels of education were found to perform significantly better in training environments than those with less education (Davis, Davis, 1990). Education has also been reported to be negatively related to computer anxiety and positively correlated with computer attitudes (Igbaria, Parasuraman, 1989), while less educated individuals possess more negative attitudes toward information systems than individuals with more education (Lucas, 1978).

Training may be viewed as a way to improve employees' *self-efficacy*, the belief that one has the capabilities to perform a particular behavior (Compeau, Higgings, 1995). Self efficacy is grounded on the theory of social cognitive behavior, one of the most powerful theories of human behavior (Venkatesh, et al., 2003), and was extended to the context of computer utilization by Compeau, Higgings (1995). In particular, end-user training may help improve *computer self-efficacy*, the judgment of one's capability to use a technology (e.g., computer) to accomplish a particular job or task (Compeau, Higgings, 1995). Computer self-efficacy it is not concerned with what one has done in the past, but

rather with judgment of what could be done in the future (Compeau, Higgings, 1995). In the context of computer use and a variety of computer behaviors, studies have found evidence of a relationship between self-efficacy and registration in computer courses at universities (Hill, et al., 1987), adoption of high technology products (Hill, et al., 1986), innovations (Burkhardt, Brass, 1990), and performance in software training (Gist, et al., 1989; Webster, Martocchio, 1992, 1993). In addition, research findings suggest that individuals with high self-efficacy use computers more, derive more enjoyment from their use, and experience less computer anxiety (Compeau, Higgings, 1995). Training end-users as a result of the integration would help increase the level of computer self-efficacy.

IS training provides end-users and IS staff with conceptual and procedural knowledge about the target system (Venkatesh, 1999), and thus plays an important role in influencing the formation of user perceptions and attitudes towards the new technology. Empirical IS research suggests that training significantly increases procedural knowledge, which in turn affects perceived ease of use (Venkatesh, Davis, 1996). It also affects attitudes (Raymond, 1990), usage (Schewe, 1976; Fuerst, Cheney, 1982; Lee, 1986; DeLone, 1988; Igbaria, et al., 1989; Kraemer, et al., 1993), and has a positive relationship with the acceptance of IT within an end-user environment (Cronan, Douglas, 1990). These results, combined with the indication that end-user training due to the integration would aid in end-user computing, raise the education level, and improve computer self-efficacy, suggest:

H 9:	*Provisions for training due to integration influence post-merger IS integration success measures, such that greater provisions for training due to integration result in greater post-merger IS integration success measures.*

Provisions for addressing IS employee morale. This variable refers to the measures taken to enable IS employees' ability to maintain belief in the organization after the merger occurs. Disregarding IS employee morale may influence departures of key IS personnel, but it can be addressed by focusing on controlling negative factors such as resistance and anxiety which may result from the merger.

Resistance, which is often referred to as 'culture clash,' results in lower commitment and cooperation among acquired employees (Buono, et al., 1985; Sales, Mirvis, 1984), greater turnover among acquired managers (Hambrick, Canella, 1993; Lubatkin, et al., 1999), decline in shareholder value at the acquiring firm (Chatterjee, et al., 1992), and deterioration in operating performance at the target firm (Very, et al. 1997; Weber, et al., 1996). A Booz Hamilton (1985) survey of 200 European chief executive officers finds that the ability to integrate organizational cultures, acculturation, is more important to merger success than financial or strategic factors (Larsson, Lubatkin, 2001). Employee resistance can occur at many levels, such as cultural clashes at the collective level, communication breakdowns and negative rumors at the interpersonal level, as well as negative psychological and career implications at the individual level (Larsson, et al., 2001). In post-merger evaluations, it is not uncommon to observe significant potential intangible losses, when viewed from the individual career perspective. The intangible losses include experience/memory, motivation, commitment, and competence (Larsson, et al. 2001). During a merger, key resources need to be preserved, as they posses the

knowledge and skills to integrate the two firms and make the merger transparent to external customers.

One of the ways for management to deal with the anxiety that follows a merger or acquisition announcement is to communicate with employees as soon as possible about all the anticipated affects of the change (Schweiger, Denisi, 1991). Failure to do so will increase uncertainty and employees' willingness to rely upon rumors, which can further increase anxiety. Such uncertainty and anxiety can lead to dysfunctional outcomes such as stress, job dissatisfaction, low commitment, low trust in the organization, and increased intentions to leave the organization (Ashford, et al., 1989; Buono, et al., 1985; Marks, Mirvis, 1983; Robino, DeMeuse, 1985; Schweiger, Ivancevich, 1985; Shirley, 1973). These types of dysfunctions can reduce productivity and increase absenteeism (Schweiger, Denisi, 1991), which are not positive outcomes under normal circumstances, and even so less during a merger, when additional work is required to successfully combine the firms. By minimizing anxiety, the risk of key IS personnel leaving the firm is reduced.

Dunker (1994) proposes that empowerment is a tool to maximize the morale and productivity of its employees and proposes keys to empowerment within a computer consulting department. These keys include: creating trust; assigning responsibility; listening; employee importance—letting employees know their jobs are important to the organization; team building—making them feel part of a group, idea recognition, praise—giving credit where credit is due; flexible controls—in work procedures; direction—clear mission and goals; communication—two-way; knowledge—training, reference materials; resource availability—adequate tools and resources; and support—

from peers and management. In the context of the post-merger IS integration, these keys to empowerment can be applied to the IS employees. Collectively, the outcomes from addressing IS employee morale issues suggest:

H 10:	*Provisions for addressing IS employee morale influence post-merger IS integration success measures, such that greater provisions for addressing IS employee morale result in greater post-merger IS integration success measures.*

After discussing the moderating variable in the Conceptual Model, degree of IS integration, Chapter 3, Table 2 provides a summary of the aforementioned, derived hypotheses, as well as additional hypotheses based on consideration of the moderating variable.

3.4 The Moderating Variable

In the conceptual model, the moderating variable is the post-merger *degree of IS integration* required. As indicated earlier, a moderator is a "qualitative (e.g., sex, race, class) or quantitative (e.g., level of reward) variable that affects the direction and/or strength of the relation between an independent or predictor variable and a dependent or criterion variable" (Baron, Kenny, 1986). The literature discussed in Chapter 2 indicates that the degree to which the IS of the merged firms are integrated is partly driven by the merger motives and the IS integration strategies selected by the IS management team. This study argues that degree of IS integration influences the strength of the relationship between the study's independent or predictor variables, i.e. the factors, and the dependent or criterion variable, i.e. post-merger IS integration success.

Theoretically, the degree of IS integration determines the planning and implementation complexity of the integration effort. Higher degrees of integration would require much more planning and coordination than lower ones. For example, a merger that is motivated by financial synergies (Trautwein, 1990; Gupta, Gerchak, 2002) may select the co-existence IS integration strategy, requiring minimal integration, perhaps limited to establishing communication components among the merged companies. On the other hand, a merger propelled by increased efficiency and operating synergy (Gupta, Gerchak, 2002) may rely on the best of breed integration strategy which would lead to more complex, time-consuming integration tasks. In this case, for example, the effect of quality of merger planning on IS integration success would be stronger than mergers in which a lower degree of IS integration is required. The study proposes that the relationship between the organizational and IS factors and IS integration success will be stronger when the degree of IS integration is higher, as a result of the additional analysis and overall complexity of the integration, suggesting:

H11-1. The degree of IS integration moderates the relationship between executive (non-IS) management support and post-merger IS integration success.
H11-2. The degree of IS integration moderates the relationship between quality of merger planning and post-merger IS integration success.
H11-3. The degree of IS integration moderates the relationship between quality of communication of merger activities to IS and post-merger IS integration success.
H11-4. The degree of IS integration moderates the relationship between degree of IS participation in merger planning and post-merger IS integration success.

H11-5. The degree of IS integration moderates the relationship quality of IS integration planning and post-merger IS integration success.
H11-6. The degree of IS integration moderates the relationship between quality of communication of IS integration activities to user areas and post-merger IS integration success.
H11-7. The degree of IS integration moderates the relationship between degree of end-user involvement in IS integration and post-merger IS integration success.
H11-8. The degree of IS integration moderates the relationship between quality of technical support to users during the IS integration and post-merger IS integration success.
H11-9. The degree of IS integration moderates the relationship between provisions for training due to integration and post-merger IS integration success.
H11-10. The degree of IS integration moderates the relationship between provisions for addressing IS employee morale and post-merger IS integration success.

The organizational and IS factor-related hypotheses derived in Chapter 3, Section 3, as well as the hypotheses relevant to the moderating variable and discussed in Chapter 3, Section 4, are summarized in Chapter 3, Table 2.

Table 3.2 Summary of Research Hypotheses

Main-effect Hypotheses	
Organizational Factors	
H 1:	Executive (non-IS) management support for IS integration activities influences post-merger IS integration success measures, such that greater executive (non-IS) management support for IS integration activities results in greater post-merger IS integration success measures.
H 2:	Quality of merger planning influences post-merger IS integration success measures, such that greater quality of merger planning results in greater post-merger IS integration success measures.
H 3:	Quality of communication of merger activities to IS influences post-merger IS integration success measures, such that greater quality of communication of merger activities to IS results in greater post-merger IS integration success measures.
H 4:	Degree of IS participation in merger planning influences post-merger IS integration success measures, such that greater degree of IS participation in merger planning results in greater post-merger IS integration success measures.
IS Factors	
H 5:	Quality of IS integration planning influences post-merger IS integration success measures, such that greater quality of IS integration planning results in greater post-merger IS integration success measures.
H 6:	Quality of communication of IS integration activities to user areas influences post-merger IS integration success measures, such that greater quality of communication of IS integration activities to user areas results in greater post-merger IS integration success measures.
H 7:	Degree of end-user involvement in IS integration activities influences post-merger IS integration success measures, such that greater degree of end-user involvement in IS integration activities results in greater post-merger IS integration success measures.
H 8:	Quality of technical support to users during the IS integration influences post-merger IS integration success measures, such that greater quality of technical support to users during the IS integration results in greater post-merger IS integration success measures.
H 9:	Provisions for training due to integration influence post-merger IS integration success measures, such that greater provisions for training due to integration result in greater post-merger IS integration success measures.
H 10:	Provisions for addressing IS employee morale influence post-merger IS integration success measures, such that greater provisions to address IS employee morale result in greater lower post-merger IS integration success measures.

Table 3.2 Summary of Research Hypotheses (Continued)

Moderation Hypotheses	
Organizational Factors	
H11-1:	The degree of IS integration moderates the relationship between executive (non-IS) management support for IS activities and post-merger IS integration success.
H11-2:	The degree of IS integration moderates the relationship between quality of merger planning and post-merger IS integration success.
H11-3:	The degree of IS integration moderates the relationship between quality of communication of merger activities to IS and post-merger IS integration success.
H11-4:	The degree of IS integration moderates the relationship between degree of IS participation in merger planning and post-merger IS integration success.
Organizational Factors	
H11-5:	The degree of IS integration moderates the relationship between quality of IS integration planning and post-merger IS integration success.
H11-6:	The degree of IS integration moderates the relationship between quality of communication of IS integration activities to user areas and post-merger IS integration success.
H11-7:	The degree of IS integration moderates the relationship between degree of end-user involvement in IS integration and post-merger IS integration success.
H11-8:	The degree of IS integration moderates the relationship between quality of technical support to users during the IS integration and post-merger IS integration success.
H11-9:	The degree of IS integration moderates the relationship between provisions for training due to integration and post-merger IS integration success.
H11-10:	The degree of IS integration moderates the relationship between provisions for addressing IS employee morale and post-merger IS integration success.

CHAPTER 4

METHODOLOGY

In this chapter, the author presents the methodology used in this study, discussing in detail the research and survey design, the survey instrument, the sample and data collection procedures, and the analyses used to acquire statistics on the data collected and to test the study hypotheses.

4.1 Research Design

To assess the influence of the ten organizational and IS factors on IS integration success, a non-experimental, descriptive design was used. Specifically, a cross-sectional survey design was employed, relying on a self-administered paper and online survey assessment instrument. The following sections describe the process used to develop the survey assessment instrument and precautions taken to ensure that the survey design successfully met the study objectives.

4.2 Survey Design

The objectives of this study were to successfully test the research hypotheses and to generalize the results to the target population. The data required had to be captured as of a certain point in time from senior IS executives at companies which completed a merger. Due to the fact that this target population is difficult to reach and has high time constraints, the data collection had to occur expeditiously and effectively and include a large enough sample to make the findings generalizable to the target population. To meet

these objectives, a descriptive, cross-sectional survey design was selected.

Descriptive designs produce information on groups and phenomena that already exist. While other descriptive designs are also available, i.e. cohort and case control designs, a cross-sectional design study provides a portrait of one or many groups during one time period, now or in the past (Fink, 2003b), which was the intent in this study. A cohort design is forward or retrospective looking, providing data about changes in specific populations. A case control design is used for retrospective studies going back in time to help explain current phenomena (Fink, 2003). Internal and external validity risks associated with cross-sectional survey designs are discussed further under the Sample and Data Collection section.

4.3 Instrumentation and Measures

The survey instrument was developed in two stages. First, a preliminary questionnaire was developed to measure organizational and IS factors and IS integration success, using a subset of validated scales and questions applied by Stylianou et al. (1996) and Robbins and Stylianou (1999). The survey was enhanced to use a 7-point Likert-type scale with various anchors, instead of a 5-point Likert-type scale. For example, the anchors include: "Very negative" and "Very positive"; "Very unsuccessful" and "Very successful"; "Very low" and "Very high." At the start of the survey, a section was also added to define terms used in the survey, to capture merger profile data, and to introduce the different sections in the survey. The terms defined for the respondents include *acquirer*, *target*, *completed M&A*, *IS integration success*, *IS integration activities*, and *degree of IS integration.* The merger profile data requested includes the name of the merger companies and their line of

business, the year when the merger was completed, and the respondent's company role in the merger—acquirer vs. target. Additional demographic questions, which will be described shortly, were also developed to capture the respondents' relevant merger background. Second, the instrument was improved based on feedback from dissertation committee members. The new questions ask whether other mergers were occurring around the same time, whether the IS function itself had been a motivator on the firm's decision to merge, how important the respondent think the IS integration is to the overall success of the merger, what factors the respondents think had a positive or negative impact on the IS integration, and how important the respondents perceive those factors to be. The survey instrument was also enhanced as a result of a pilot conducted with ten IS management team members, which tested the study data collection procedures and improved the instrument's readability. Immediately after pilot participants returned their surveys, they were contacted for feedback. Based on their comments, the adjustments were made. The timeframe from which the 'assessment' questions should be answered was clarified, e.g., immediately after the post-merger IS integration, not from today's perspective, and the survey was printed on single-sided paper, instead of double sided. Finally, the researcher clarified that the $5 donation to the American Cancer Society per returned survey was to be made in the name of the researcher to preserve the respondent's anonymity (see Appendix B, The Survey Instrument).

In addition to the two introduction pages, the survey instrument contains three sections. Section one of the survey captures data relevant to the five dimensions used to measure post-merger IS integration success, which is the dependent variable. The five post-merger IS integration success measures as depicted in the Conceptual Model

(Chapter 3, Figure 3) include: 1) *Improved IS capability outcomes* (Q1—items a to l—12 items); 2) *IS contribution to the overall merger schedule and merger budget* (Q2—items a to b—2 items); 3) *IS ability to exploit opportunities and avoid problems arising from the merger* (Q4—items a to b—2 items); 4) *IS resource utilization* (Q3, items a to c—3 items), and 5) *perceived IS integration success* (Q5). Section one of the survey also measures overall merger success (Q6), *degree of IS integration* (Q7), which is the moderating variable, the perceived role of the IS function in the acquirer's decision to merge with the target (Q8), and the perceived importance of the IS integration to merger success (Q9). Degree of IS integration was operationalized using a single item measure on a 7-point semantic differential scale, anchored at "non-existent" and "extensive."

Section two of the survey captures the data relevant to the four organizational and six IS factors, which are the independent variables in this study: 1) *executive (non-IS) management support for IS integration activities* (Q10); 2) *quality of merger planning* (Q13—items a, b); 3) *quality of communication of merger activities to IS* (Q11—item b); 4) *degree of IS participation in merger planning* (Q12—items a, b); 5) *quality of IS integration planning* (Q13—item c); 6) *quality of communication of IS integration activities to user areas* (Q11—item a); 7) *degree of end-user involvement in IS integration activities* (Q14); 8) *quality of technical support to users during the IS integration* (Q15 and Q17); 9) *provisions for training due to integration* (Q18—items a, b); 10) and *provisions to address IS employee morale* (Q16). This section also asks participants to list the top three issues/factors that had a positive (Q19) and negative (Q20) impact on the overall IS integration, and to assess whether the impact had low or

high significance. Their answers will be compared with the factors of focus in this study. in this study..

Section three of the survey captures respondent demographics, which include: title during the IS integration (Q21), years of IS management experience (Q22), years of experience with IS integrations (Q23), and years of merger experience (Q24).

As mentioned earlier, the measures for organizational factors, IS factors, and post-merger IS integration success were validated by previous studies (Stylianou et al., 1996; Robbins, Stylianou 1999). Nonetheless, this study tests the internal consistency reliability or homogeneity of the survey scales by computing their Cronbach's alpha scores (Chapter 5, Section 4 presents the findings). The study improves upon the previous instrument by employing a 7-point semantic differential scale with anchors that are polar opposites, making it easier to determine what the middle point represents. The survey layout was also reformatted, improving readability and ease of completion.

4.4 Sample Selection and Data Collection Procedures

The target population and sampling units for this study were senior IS executives at organizations which completed a U.S. public merger greater than $25 million, as identified in the *Mergers & Acquisitions: The Dealermaker's Journal* and Lexis Nexis' Hoover's Company Records. 1,010 people belonging to companies that had completed a merger during the time period between 2004 and 2007 were selected randomly to be included in the sample. This timeframe facilitated reaching individuals who experienced the merger or acquisition while giving the deal enough time for the IS integration to have been underway, or completed. Because the data to be used in this study is not available

through any secondary archival source, key informants in each firm were asked to provide the data through a survey. The key informants were the senior executives in charge of IS, as these executives are considered to be the people in a firm who would be the most knowledgeable about the post-merger IS integration, or other senior level IS management personnel whose names were publicly available via their company website. The title most often held by the senior IS executive is Chief Information Officer (CIO), IT Director, Vice President of IS, Director of Information Resources, Director of IS (Grover, et al., 1993), and CTO (Adler, Ferdows, 1990). Data was collected in the first quarter and beginning of the second quarter of 2008.

Few survey undertakings are as difficult as defining, sampling, contacting, and obtaining responses to self-administered questionnaires from businesses and other organizations (Dillman, 2000). Among the challenges are company policies that prevent individuals from responding to surveys, and the need to go through a gatekeeper, who is the person who opens the mail and/or answers the telephone and who often screens requests for survey participation even without knowing what the request is about (Dillman, 2000). Despite these challenges, this study acknowledges that in order for the study results to be meaningful among IS field researchers and IS management teams, the data had to be collected from professionals in the field.

Cross-sectional survey designs have limitations and potential for bias and invalidity, some of which are based on the sampling used, requiring the researcher to address and mitigate them. An internally valid survey design is free of non-random error or bias, while an externally valid one produces results that apply to the target population (Fink, 2003b). With a cross-sectional survey design, Fink (2003b) admonishes against

the following risks to internal validity: if the survey is lengthy, *history*, which includes historical events that may occur and can bias the results; *maturation*, which refers to changes within individuals that result from natural, biological, or psychological development; *selection*, which refers to giving every eligible person or unit an equal, nonzero change of being included; and *attrition*, or the loss of study participants and the data they could have provided. A risk to external validity of a survey design includes a sample that is not representative of the target population.

To mitigate *history* risks in this study, the sample was drawn from a list of mergers that occurred between 2004 and 2007 and the data collection took place during the first two quarters of 2008. This timeframe facilitates participants remembering information regarding the state of post-merger organizational and information systems factors, as well as post-merger IS integration results. *Maturation* was not a major risk in this study as the data collection spanned approximately four months and the target sampling units were business professionals already mature. S*election* risk was mitigated by randomly selecting the participants. *Attrition* was addressed by implementing a four-step mail contact procedure, and supplementing the paper survey data collection with an online survey. To lower *external validity* risks, the researcher focused on compiling a sample that was representative of the target population.

The mail survey was administered following guidelines recommended by Dillman (2000) with the objective of maximizing the response rate. The survey was mailed using a four-step process. First, a pre-letter was sent to alert senior IS executives that they would be receiving the survey within a few days, to inform them of the survey's purpose and importance, and to request their participation. Second, a packet was mailed that

included a cover letter, the survey, and pre-addressed postage-paid return envelope. The primary goal of the cover letter was to motivate senior IS executives to answer the survey by supplying the following key pieces of information (Kitchenham, Pfleeger, 2002): the purpose of the study, the reason why the study results should be of relevance to them, how they would be rewarded for their participation, why each individual's participation was important, how and why they were chosen, and how confidentiality was going to be preserved. Third, a reminder letter was mailed a week after the survey packet was mailed. This letter thanked recipients who had completed and returned the survey and requested that others do so as promptly as possible. For those recipients who were not willing to complete the survey, it asked them to identify reasons why they opted out. Those who provided a reason for not participating were removed from the survey sample. Lastly, between two and four weeks after the original survey was mailed, a replacement survey was mailed to all members in the sample who had not responded. In addition to the information covered in the original cover letter, the cover letter accompanying the replacement survey reminded recipients of the importance of identifying a reason why they would not participate in the survey.

All survey-related correspondence was personalized, incorporated the New Jersey Institute of Technology and College of Computing Sciences logos, and was sent via first-class mail using stamps, rather than metered postage. These steps were taken to increase the perceived social exchange in the survey process and thereby help boost response rate (Dillman, 2000). With the intent of improving responses, the survey mailings were purposely timed outside of the Thanksgiving to New Year's day holiday period, a period when the lowest response rates are obtained (Dillman, 2000).

To boost responses, by the end of the four-step mail survey process, the researcher had created an online version of the paper survey and related artifacts using SurveyMonkey.com, and had compiled the e-mail addresses of the individuals in the sample who had not responded to the mail survey. The URL for the online survey was e-mailed to non-responders, and included all aforementioned components of the paper survey, namely the introduction page, the consent form, and the questionnaire. Samples of consent forms, paper pre-letter, paper survey cover letter, paper follow-up reminder letter, paper replacement survey and cover letter, and e-mails sent can be found in Appendix C.

CHAPTER 5

ANALYSIS AND RESULTS

This chapter describes the analyses conducted on the survey data and the statistical results based on that analyses. The questionnaire was sent to 1,010 potential participants. After a four-month data collection period that spanned from the end of January 2008 to the end of May 2008, the four-step mail survey data collection generated 42 responses and the online survey generated 60 responses, for a total of 102 responses. The number of responses is equivalent to a 17% response rate, after adjusting the sample size to 600 based on undeliverable surveys and mail correspondence indicating that the addressee was not involved in the post-merger integration, preferred not to answer, could not answer based on company policy prohibiting participation in surveys, or was no longer with the company. Because both paper survey and online survey data collection methods were applied to bolster responses, Chapter 5, Section 5 outlines the analysis that was conducted to assess whether differences between these two groups exist.

The data were statistically analyzed using Statistical Package for the Social Sciences, SPSS version 16.0, and Analysis of Moment Structures, AMOS 16.0, used only in the supplemental path model analyses. Before data analyses began, a missing value analysis was conducted to examine missing values in the dataset. Missing values were missing completely at random and were fewer than 5% in number. Therefore, those participants with missing values were not included in the analysis that would have used the values that were missing. Descriptive statistics, confirmatory principal component factor analysis, composite scores, Chronbach's alpha scores, Pearson's r correlations, and multivariate analysis of variance (*MANOVA*) were applied in this study. To test the study

hypotheses, standard multiple regression and forward stepwise regression analyses were conducted (Chapter 3, Table 2). A supplemental path model analysis was conducted to identify the relationship among the factors. The Analysis Plan Summary at the end of this chapter (Chapter 5, Table 10), presents a consolidated view of all analyses discussed below.

5.1 Descriptive Statistics

Appendix D outlines the descriptive statistics calculated on the demographic data (Q21 – Q24), including respondent's title, years of experience in IS management, years of IS integration experience, and number of mergers experienced. It also presents descriptive statistics on the merger profile data collected on the survey introduction page (e.g., company line of business, year when the merger was completed, and company's role—acquirer vs. target). Appendix D also presents descriptive statistics regarding the IS function's role in the companies' decision to merge, the relative importance of the IS integration to the overall merger success, whether the respondent's company was experiencing any other mergers around the same time, and the top three positive and negative factors impacting the overall IS integration.

Regarding the respondents' demographics, 85.3% have a Technology title that includes Vice President, Director, Chief Technology Officer, Chief Information Officer, Senior VP, Executive VP, IT Leader, or President. The remaining titles were also technology related, with the exception of one Chairman and CEO. On average, the respondents were experienced with IS management (M=18.77, SD=7.86), IS integrations (M=12.92, SD=7.97), and mergers (M=8.26, SD=7.86). The primary business areas for

the companies involved in the merger ran the gamut, including but not exclusive to IT, financial services, banking, business services, telecommunication, title insurance, and healthcare. 89.1% of respondents represented the acquiring company and the remaining 10.9% represented the target firm. The respondents were given the flexibility to answer the survey based on the specific company merger the researcher identified on the survey cover letter (e.g., one occurring between 2004 and 2007), or choose a merger of their choice. 80.2 % of the mergers reported occurred during 2006 (37.6%), 2005 (32.7%), and 2007 (9.9%).

Descriptive statistics on the merger profile indicate that 55.4% of respondents' firms were not involved in another merger at the same time, while 44.6% indicate that their firms were undergoing another merger. The remaining descriptive statistics described in Appendix D are discussed further in Chapter 5, Section 7.2, namely the IS function's role in the companies' decision to merge, the relative importance of the IS integration to the overall merger success, and the top three positive and negative factors impacting the overall IS integration,.

5.2 Factor Analysis

A confirmatory principal component factor analysis utilizing Varimax rotation with Kaiser normalization was conducted on the 20 questions measuring the five IS integration success measures depicted in the Conceptual Model (Chapter 3, Figure 3). Appendix E, Table 1 through Table 4, present the statistics from the factor analysis. Factor analysis provides some assurance that the IS integration success measures are actually measuring the indicated underlying dimensions. Factor analysis is a "statistical technique applied to

a single set of variables when the researcher is interested in discovering which variables in the set form coherent subsets that are relatively independent of one another. Variables that are correlated with one another but largely independent of other subsets of variables are combined into factors. Factors are thought to reflect underlying processes that have created the correlations among variables" (Tabachnick, Fidell 2001). From this analysis, two factors surfaced, and the resulting two factors' composite scores were used in subsequent analysis involving the IS integration success measures. Each of the 20 items loaded significantly (.51 or higher) on either one of the two factors (components). The critical value for a sample size N=100 is .256 (Stevens, 2002). To ensure that the loading was statistically significant, this number was doubled, thus all items loading at .51 or higher on one of the components were kept. This kind of statistical check is most crucial when the sample size is small or small relative to the number of variables being factor analyzed (Stevens 2002). Although our sample size of 102 conforms to the 5-to-1 ratio of cases-to-items being factor analyzed (20 items in total) (Tabachnick, Fidell, 2001), this is a conservative measure. From the results, the first component or factor includes the 13 items measuring *improved IS capability outcomes* and *IS ability to exploit opportunities*, while the second component or factor includes the remaining seven items measuring *IS contribution to merger plan and budget*, *resource utilization*, *IS integration success*, and *IS ability to avoid problems*. From this point forward, the two resulting factors will be referred to as the *IS Capability* and *IS Performance* success measures.

5.3 Composite Scores

Several composite scores were calculated. From the confirmatory principal component factor analysis, two composite scores were calculated for the items loading significantly on IS Capability and IS Performance success measures. Four composite scores were calculated for scales associated with the independent variables, the organizational and IS factors: *quality of merger planning* (Q13—items a to b—2 items); *degree of IS participation in merger planning* (Q12—items a to b—2 items); q*uality of technical support to users during the IS integration* (Q15 and Q17); and *provisions for training due to integration* (Q18—items a to b—2 items).

5.4 Cronbach's Alpha Test of Reliability

Although the questionnaire scales were validated by Stylianou et al. (1996) and Robbins and Stylianou (1999), to confirm the internal consistency reliability or homogeneity of the subscales, Cronbach's alpha test of reliability was conducted on the IS Capability subscale, the IS Performance subscale, and organizational and IS factor subscales. Cronbach's alpha measures the ability of the composite subscale to measure the variable of interest. George and Mallery (2003) suggest the following rules of thumb for evaluating Cronbach's alpha coefficients: greater than 0.9 is excellent, greater than 0.8 is good, greater than 0.7 is acceptable, greater than 0.6 is questionable, greater than 0.5 is poor, and less than 0.5 is unacceptable. The Cronbach's alpha coefficient for the 13 items comprising the IS Capability subscale was 0.96, and for the seven items comprising the IS Performance subscale it was 0.92, indicating *excellent* measures. Cronbach's alpha coefficients for the items included in the subscales for organizational factors *quality of*

merger planning (.92) and *degree of IS participation* (.90) also indicate *excellent* measures. The Cronbach's alpha coefficients for the items included in the subscales for IS factors *quality of technical support to users during integration* (.81) and *provisions for training due to the integration* (.79) indicate that these are *good* and *acceptable* measures, respectively.

5.5 Testing for Respondent Bias

To examine respondent bias, two Pearson *r* correlations were conducted between success measures IS Capability and IS Performance, and the independent variable *perceived merger success* (question 6). A significant relationship would indicate the influence of perceived merger success on the success measures, and would require that perceived merger success be treated as a control variable in subsequent analyses. The results of the Pearson *r* correlation between IS Capability and perceived merger success was significant, $r\,(100) = 0.64$, $p < 0.01$, as well as the results of the Pearson correlation on IS Performance and perceived merger success, $r\,(100) = 0.70$, $p < 0.01$. Subsequently, perceived merger success was included in the remaining analyses as a covariate.

To examine whether there were significant differences on the two IS success measures, IS Capability and IS Performance, based on the data collection group (paper vs. online), a multivariate analysis of variance (*MANOVA*) was conducted. The assumptions of normality and linearity were met. Levene's Test of Equality of Error Variances was not significant for either success measure IS Capability or IS Performance, indicating that the assumption of homogeneity of variances was met for each of the two subscales. Box's M test of equality of covariance matrices was not significant, indicating

that the assumption of homoscedasticity was met. The model was not significant, indicating the absence of a main-effect on the linear combination of IS Capability and IS performance by group (Paper vs. Online), Wilks $\lambda = 1.00$, F (2, 99) = 0.25, $p = 0.78$, Partial $\eta^2 = 0.01$, Power = 0.09. The results are summarized in Appendix F, where the means and standard deviations are presented in Table 1 and Table 2.

5.6 Hypotheses Testing

To test the **main-effect hypotheses**, two standard multiple regression and two forward stepwise regression analyses were conducted, where for each of the multiple regressions the ten organizational and IS factors, the predictors, were entered at once, and the IS Capability and IS Performance success measures, the dependent variables, where entered in turn. To test the **moderation hypotheses**, ten moderation regressions were conducted. Factors were entered one at a time, along with the moderator, degree of IS integration, and the product of the interaction of the factor and the moderator. If the interaction term proved to be significant, then a moderation hypothesis would be supported. Appendix G captures all analyses results which are discussed below.

The assumptions of multiple regression analysis, namely no multicollinearity or singularity, a big enough sample, no outliers, normality, linearity, and homoscedasticity were assessed using the output from SPSS multiple regression procedures. Lack of multicollinearity or singularity was assessed and met by inspecting the Correlation matrices and the collinearity diagnostics on the ten factors. First, the ten factors showed at least some relationship with the dependent variables, IS Capability and IS Performance success measures. This was confirmed by correlations which ranged from .51 to .75.

Secondly, inspecting the correlation among the factors, none of them appeared to be highly correlated, i.e. r =.9 and above (Pallant, 2001). In addition, each factor's tolerance value was examined from the collinearity diagnostics and none of them appeared to be very low (near 0), suggesting that the multiple correlation with other factors was acceptable. The tolerance values ranged from .16 to .45. Appendix G, Table 2, display the collinearity statistics.

Regarding the assumption of a large enough sample, different authors tend to give different guidelines about the number of cases required for multiple regression. Stevens (1996) recommends that 'for social science research, about 15 subjects per predictor are needed for a reliable equation'. In this study, that would have meant using approximately 15 (subjects) X 10 (factors), or 150 subjects for the analysis. Tabachnick and Fidell (1996) recommend using a sample size N, where N > 50 + 8m (where m = number of independent variables). In which case, for this study, the desired sample size would have been greater than 50 + 8*10, or more than 130 subjects. This study achieved 102 responses, a sample size that generated significant statistics, as will be described shortly, e.g., the multiple regression models were significant and explained 66% and 76% of the variability in IS Capability and IS Performance, respectively. This study managed to strike a balance between the length of the survey and the amount of information colleted, while still allowing the collection of enough responses for valid statistical analyses.

The assumption of the absence of outliers was assessed and met through examination of boxplots (Appendix G, Figure G.1) and z values. Two particular values for the factor Quality of Technical Support Provided to Users During Integration, Q15 & Q16 composite, were examined closer and ruled out as not being outliers. Stevens (2002)

indicates that when detecting outliers, absolute value of z scores > 3 should be considered as potential outliers. This is the case because in an approximate normal distribution about 99% of the scores should lie within three standard deviations of the mean. Thus, any z value > 3 indicates a value very unlikely to occur. The boxplot highlighted a score with a z value of -2.66, and based on the aforementioned explanation, this value was dismissed as not being an outlier. Another score with a z value of -3.08 was examined as a potential outlier. However, Stevens (2002) explains that for an $n > 100$, which is the case in this study, by chance we might expect a few subjects to have the absolute value of z scores > 3. Furthermore, even for *any type of distribution* the above rule is reasonable, although we might consider extending the rule to $z > 4$. Taking this into consideration, it was determined that the data sample did not contain outliers.

The assumption of normality was assessed and met through examination of normal probability plot of expected values vs. observed values (Appendix G, Figure G.2 and Figure G.4). If the points had created a bow-shaped or s-shaped pattern about the diagonal line, the assumption would have been violated. However, a close distribution of points about the diagonal line indicates that the assumption was met.

Finally, the assumptions of linearity and homoscedasticity were assessed and met through examination of-scatter plots of standardized residuals vs. standardized predicted values (Appendix G, Figure G.3 and Figure G.5). The presence of a curved pattern about the horizontal line would have indicated that the assumption had been violated. However, an even distribution of points about the horizontal line indicates that the assumption was met. Chapter 5, Table 1 presents a consolidated view of the findings which are discussed below.

Table 5.1 Hypotheses Analysis Results Summary

Main-effect Hypotheses	Results
Organizational Factors	
H-1: Executive (non-IS) management support for IS integration activities influences post-merger IS integration success measures, such that greater executive (non-IS) management support for IS integration activities results in greater post-merger IS integration success measures.	Indirectly Supported*
H 2: Quality of merger planning influences post-merger IS integration success measures, such that greater quality of merger planning results in greater post-merger IS integration success measures.	Supported
H 3: Quality of communication of merger activities to IS influences post-merger IS integration success measures, such that greater quality of communication of merger activities to IS results in greater post-merger IS integration success measures.	Supported
H 4: Degree of IS participation in merger planning influences post-merger IS integration success measures, such that greater degree of IS participation in merger planning results in greater post-merger IS integration success measures.	Indirectly Supported*
IS Factors	
H 5: Quality of IS integration planning influences post-merger IS integration success measures, such that greater quality of IS integration planning results in greater post-merger IS integration success measures.	Supported
H 6: Quality of communication of IS integration activities to user areas influences post-merger IS integration success measures, such that greater quality of communication of IS integration activities to user areas results in greater post-merger IS integration success measures.	Indirectly Supported*
H 7: Degree of end-user involvement in IS integration activities influences post-merger IS integration success measures, such that greater degree of end-user involvement in IS integration activities results in greater post-merger IS integration success measures.	Supported
H 8: Quality of technical support to users during the IS integration influences post-merger IS integration success measures, such that greater quality of technical support to users during the IS integration results in greater post-merger IS integration success measures.	Supported
H 9: Provisions for training due to integration influence post-merger IS integration success measures, such that greater provisions for training due to integration result in greater post-merger IS integration success measures.	Indirectly Supported*
H 10: Provisions for addressing IS employee morale influence post-merger IS integration success measures, such that greater provisions to address IS employee morale result in greater lower post-merger IS integration success measures.	Not Supported

Table 5.1 Hypotheses Analysis Results Summary (Continued)

Moderation Hypotheses	**Results**
Organizational Factors	
H11-1: The degree of IS integration moderates the relationship between executive (non-IS) management support for IS activities and post-merger IS integration success.	Supported
H11-2: The degree of IS integration moderates the relationship between quality of merger planning and post-merger IS integration success.	Not Supported
H11-3: The degree of IS integration moderates the relationship between quality of communication of merger activities to IS and post-merger IS integration success.	Not Supported
H11-4: The degree of IS integration moderates the relationship between degree of IS participation in merger planning and post-merger IS integration success.	Not Supported
IS Factors	
H11-5: The degree of IS integration moderates the relationship between quality of IS integration planning and post-merger IS integration success.	Not Supported
H11-6: The degree of IS integration moderates the relationship between quality of communication of IS integration activities to user areas and post-merger IS integration success.	Not Supported
H11-7: The degree of IS integration moderates the relationship between degree of end-user involvement in IS integration and post-merger IS integration success.	Not Supported
H11-8: The degree of IS integration moderates the relationship between quality of technical support to users during the IS integration and post-merger IS integration success.	Not Supported
H11-9: The degree of IS integration moderates the relationship between provisions for training due to integration and post-merger IS integration success.	Not Supported
H11-10: The degree of IS integration moderates the relationship between provisions for addressing IS employee morale and post-merger IS integration success.	Not Supported

* See Chapter 5, Section 7.1 for path model analysis results that indicate indirect support.

5.6.1 Hypotheses 1 – 10: Testing of Main-effect

To test the ten main-effect hypotheses, a multiple linear regression was conducted on **IS Capability** using all ten organizational and IS factors as predictors and controlling for respondent bias, *perceived merger success*. The model was statistically significant, F (11, 89) = 18.85, $p < 0.01$, and accounted for 66.3% of the variability in IS Capability, meaning that 66.3% of the variance in IS Capability can be predicted by the combination of the ten organizational and IS factors, after controlling for respondent bias. Means and standard deviations on the individual measures are presented in Appendix G, Table 3. The results are summarized and the beta coefficients are presented in Appendix G, Table 4, where for every one point increase in *degree of end-user involvement in IS integration activities,* there is an increase in IS Capability of 0.25. The results indicate that only *degree of end-user involvement in IS integration activities* significantly contributed to the model predicting IS Capability, thus supporting Hypothesis H7.

For the purpose of a more parsimonious model and to examine the pure predictive value of the ten organizational and IS factors on **IS Capability**, a forward stepwise regression was conducted, while controlling for respondent bias. The final model was significant, F (4, 96) = 49.67, $p < 0.01$, and accounted for 66.1% of the variability in IS Capability. The final model included only the control variable, *perceived merger success*, and the IS factors *degree of end-user involvement in IS integration activities*, *quality of IS integration planning*, and *quality of technical support to users during the IS integration.* The results mean that 66.1% of the variance in IS Capability can be predicted by the combination of *degree of end-user involvement in IS integration activities*, *quality of IS integration planning*, and *quality of technical support to users*

during the IS integration, holding *perceived merger success* constant, thus supporting Hypotheses H5, H7 and H8. The results are summarized and the beta coefficients are presented in Appendix G, Table 5, where for every one point increase in *degree of end-user involvement in IS integration activities*, there is an increase in IS Capability of 0.22, for every one point increase in *quality of IS integration planning*, there is an increase in IS Capability of 0.14, and for every one point increase in *quality of technical support to users during the IS integration*, there is an increase in IS Capability of 0.20.

To continue testing the ten main-effect hypotheses, a multiple linear regression was conducted on **IS Performance** using all ten organizational and IS factors as predictors and controlling for respondent bias. The model was statistically significant, F (11, 89) = 29.54, $p < 0.01$, and accounted for 75.8% of the variability in IS Performance, meaning that 75.8% of the variance in IS Performance can be predicted by the combination of the ten organizational and IS factors after controlling for respondent bias. Means and standard deviations on the individual measures are presented in Appendix G, Table 3. The results are summarized and the beta coefficients are presented in Appendix G, Table 6, where for every one point increase in *quality of communication to merger activities to IS*, there is an increase in IS Performance of 0.23. The results indicate that only *quality of communication to merger activities to IS* significantly contributed to the model predicting IS Performance, thus supporting Hypothesis H3.

For the purpose of a more parsimonious model and to examine the pure predictive value of the ten organizational and IS factors on **IS Performance**, a forward stepwise regression was conducted, while controlling for respondent bias. The final model was significant after controlling for respondent bias, F (3, 97) = 106.33, $p < 0.01$, and

accounted for 76.0% of the variability in IS Performance. The final model included only the control variable, *perceived merger success*, and organizational factors *quality of communication to merger activities to IS* and *quality of merger planning.* The results mean that 76.0% of the variance in IS Performance can be predicted by the combination of *quality of communication to merger activities to IS* and *quality of merger planning*, holding *perceived merger success* constant, thus supporting Hypotheses H2 and H3 . The results are summarized and the beta coefficients are presented in Appendix G, Table 7, where for every one point increase in *quality of communication to merger activities to IS*, there is an increase in IS Performance of 0.39, and for every one point increase in *quality of merger planning*, there is an increase in IS Performance of 0.23.

According to Tabachnick and Fidell (2001), forward stepwise regression analysis tends to capitalize on chance and overfit the data. It capitalizes on chance because decisions about which variables to include are dependent on the potentially minor differences in statistics computed from a single sample, where some variability in the statistics from sample to sample is expected. It overfits the data because the equation derived from a single sample is too close to the sample and may not generalize well to the population. They recommend cross-validation within a second sample. One of the ways this can be accomplished is to divide the data into two random samples, 50% for the stepwise and the remaining 50% for the cross-validation sample. After running the stepwise regression on both samples, the R^2 are compared between the two samples. Large discrepancy between R^2 in the two samples indicates overfitting and lack of generalizability of the results of the analysis. In this study, the R^2 for the stepwise regression predicting IS Capability Sample 1 was .715 and Sample 2 was .829. The R^2

for the stepwise regression predicting IS Performance Sample 1 was .635 and Sample 2 was .747, making the difference in R^2 small (.114 for the stepwise regression predicting IS Capability, and .112 for the stepwise regression predicting IS Performance), suggesting that the results are generalizable to the target population.

5.6.2 Hypotheses 11-1 to 11-10: Testing the Moderation Effect

To test the ten moderation hypotheses (H11-1 through H11-10) and examine whether standardized *degree of IS integration* moderates the relationship between each of the standardized organizational and IS factors and **IS Capability**, ten moderation regressions were conducted, while controlling for standardized *perceived merger success*. With the exception of the moderation regression including *executive (non-IS) management support* and IS Capability, none of the ten interaction variables were found to be significant. In the case of the moderation regression including *executive (non-IS) management support*, the final model including the interaction variable was statistically significant, F (4, 97) = 31.82, $p < 0.01$, and accounted for 55.0% of the variability in IS Capability. The interaction variable itself was also significant, indicating that the relationship between the standardized *executive (non-IS) management support* and IS Capability is influenced by the standardized *degree of IS integration*, after controlling for standardized *perceived merger success*. The results are summarized and the beta coefficients are presented in Appendix G, Table 8. The results also show that when the *degree of IS integration* is low, the relationship between *executive (non-IS) management support* and IS Capability is strongest, and when the *degree of IS integration* is high, the relationship between *executive (non-IS) management support* and IS Capability is weakest. Maximum

dispersal of the means of IS Capability occurred at low levels of *executive (non-IS) management support*, meaning that IS Capability varied greatest at low levels of *executive (non-IS) management support* and were lowest with a low *degree of IS integration*. Said differently, at high levels of *executive (non-IS) management support*, IS integration success varied little between low, medium, and high levels of degree of IS integration. These results are summarized in Chapter 5, Figure 1. This finding supports moderation Hypothesis H11-1.

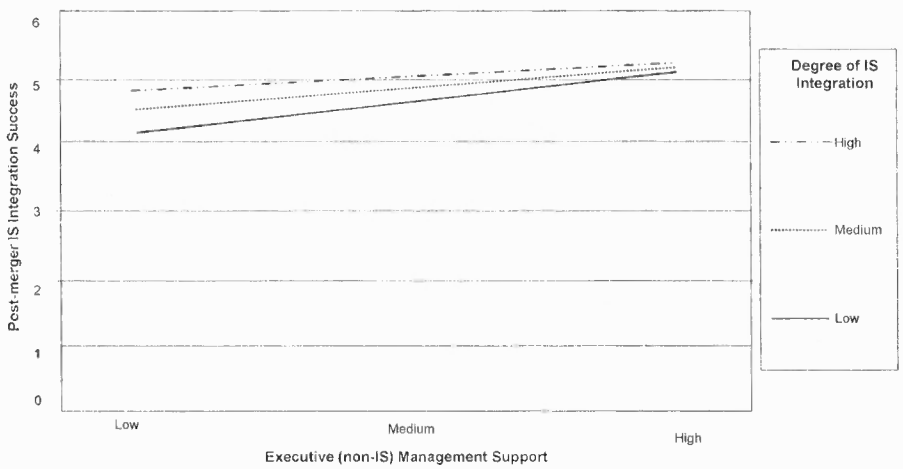


Figure 5.1 Degree of IS integration moderating executive (non-IS) mgnt. support.

To continue testing the ten moderation hypotheses (H11-1 through H11-10) and examine whether standardized *degree of IS integration* moderates the relationship between each standardized organizational and IS factors and **IS Performance**, ten moderation regressions were conducted, while controlling for standardized *perceived merger success*. In this case, none of the ten interaction variables were found to be significant. Thus, none of the moderation hypotheses were supported.

5.7 Supplemental Analyses

At first glance, the multiple regression analyses conducted to test the main-effect hypotheses suggest that only five of the factors significantly influence post-merger IS integration success. However, the strong relationships among the factors, evidenced by the correlation coefficients outlined in Appendix G, Table 1, suggest that perhaps the relationships are more complex than what multiple regression analyses are able to portray. Specifically with the goal of investigating the relationships among the five factors that are found to directly influence post-merger IS integration success and those that appear not to, Chapter 5, Section 7.1 describes the creation, testing, and results of two hypothesized path models predicting IS Capability and IS Performance, relying on structural equation modeling. The hypothesized path models that emerge become major contributions of this research, forming the basis for future research, as well as supporting the indirect influence of some of the factors on post-merger IS integration success. In addition, although not hypothesized by the study, to enhance the reliability of the study findings, Chapter 5, Section 7.2 outlines the results of the analyses on survey questions that asked respondents for their opinion regarding the relative importance of the IS integration to the overall success of the merger, the role of the target company's IS function in the firms' decision to merge, and the top three factors that had a positive/negative impact on the overall IS integration. The findings substantiate the importance of the IS integration to the merger success and enhance the reliability of the study findings by identifying factors that were also found to directly influence post-merger IS integration success during the multiple regression analyses. The supplemental analyses were not planned originally, rather it came to bear by the need to understand and

explain the results from the main-effect hypotheses tests, while also helping to compare the study findings with insight from experienced practitioners as to what they consider to be contributors and detractors of post-merger IS integration success.

5.7.1 Supplemental Path Model Analysis

As previously discussed, the multiple regression analyses support the Conceptual Model (Chapter 3, Figure 3), which indicates that together all ten factors significantly predict post-merger IS integration success, measured through IS Capability and IS Performance. However, from that analyses only five out of ten factors are found to individually, significantly predict IS Capability and IS Performance. Thus, three main-effect hypotheses are supported (H7, H5, and H8) connecting **IS Capability** with IS factors *F7 degree of end-user involvement in IS integration activities*, *F5 quality of IS integration planning*, and *F8 quality of technical support to users during the IS integration.* Similarly, two main-effect hypotheses are supported (H2 and H3) connecting **IS performance** with organizational factors *F2 quality of merger planning* and *F3 quality of communications of merger activities to IS.* The prefixes used when referring to the factors (e.g., *F7, F5, F8, F2, F3, etc.)* are used to facilitate the discussion and help the reader locate the factors in the hypothesized path models. Closer inspection of correlation among the factors, captured in Appendix G, Table 1, suggests that further investigation regarding the factors' relationship is merited. In this section, due to lack of a priori theory that predicts how the factors in question relate to one another, two hypothesized path models are developed using a sequential series of regressions (Ingram,

et al., 2000). Although not hypothesized, the path models are tested using structural equation modeling in an effort to understand the relationships among the factors.

Structural equation modeling is a confirmatory analytical tool for testing a hypothesized structural relationship among multiple variables. Unlike regression analysis, in which one linear relationship is tested, path analysis using structural equation modeling allows for the simultaneous analysis of a number of linear relationships in which a dependent variable in one equation can become an independent variable in a subsequent equation (Shook, et al., 2004). Structural equation modeling is thus an appropriate analytical tool for testing a complex relationship among the factors in this research. The hypothesized path models are assessed using goodness of fit indices (Byrne, 2001), and the mixed results from this assessment are indicative of hypothesized path models that require further investigation.

5.7.1.1 Path Models Creation. The model creation began by drawing the direct paths into IS Capability and IS Performance based on the results of the aforementioned forward stepwise regression analyses. First, the results indicate that three IS factors significantly predict IS Capability, thus direct paths into IS Capability were drawn and include *F7 degree of end-user participation in IS integration activities*, *F5 quality of IS integration planning*, and *F8 quality of technical support to users during the IS integration.* Similarly, the results show that two organizational factors predict IS Performance, thus direct paths into IS performance were drawn and include *F2 quality of merger planning*, and *F3 quality of communication of merger activities to IS*. Chapter 5, Figure 2 shows the direct paths into IS Capability and IS Performance. Next, the study identifies the

remaining paths in the hypothesized IS Capability path model and respective path coefficients, followed by the hypothesized IS Performance path model.

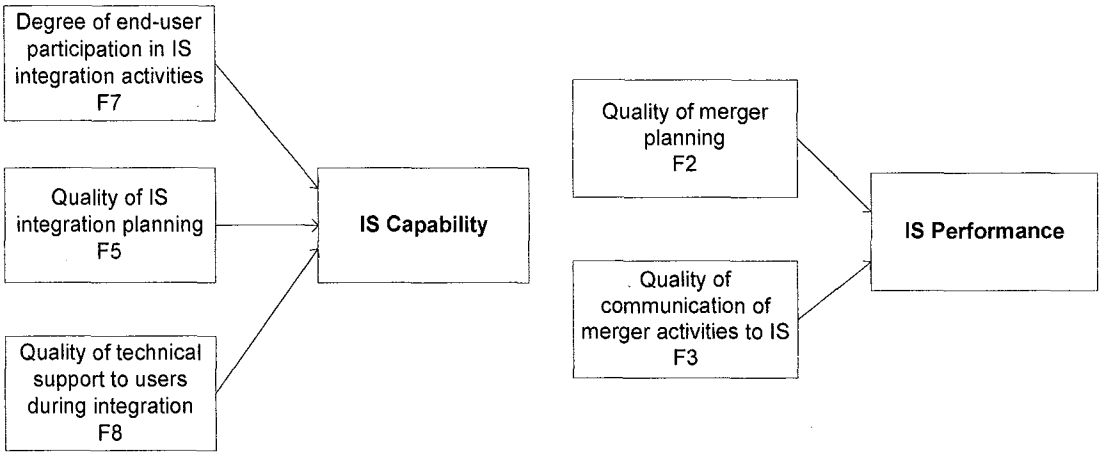


Figure 5.2 Factors directly influencing IS capability and IS performance.

To identify the relationship between the three factors directly influencing **IS Capability** (F7, F5, and F8) and the remaining seven factors in the Conceptual Model (Chapter 3, Figure 3), three multiple regressions were run. The multiple regressions used each of the three factors in turn, F7, F5, and F8, as the dependent variable, and the remaining seven factors at once as the independent variables, while controlling for respondent bias (*perceived merger success*). The results are summarized and the beta coefficients are presented in Appendix H, and indicate that *F9 provisions for training due to integration* and *F10 provisions to address IS employee morale as a result of the merger* significantly predict ***F7*** *degree of end-user participation in IS integration activities* (Appendix H, Table 1). Results show that *F2 quality of merger planning*, *F4 degree of IS participation in merger planning*, and *F10 provisions for training due to the integration* significantly predict ***F5*** *quality of IS integration planning* (Appendix H,

Table 2), and that *F6 quality of communication of IS integration activities to user areas* and *F4 degree of IS participation in merger planning* significantly predict ***F8 quality of technical support to users during the IS integration*** (Appendix H, Table 3). Based on these findings, the paths leading into F7, F5, and F8 were drawn. The double arrows between the exogenous variables in the model reflect the correlations among factors, as outlined in Appendix G, Table 1. The hypothesized path model predicting IS Capability and all its associated parameters, but no path coefficients, appears in Chapter 5, Figure 3.

The hypothesized path model being proposed to explain the relationship among the factors influencing **IS Capability** (Chapter 5, Figure 3) consists of four simultaneous equations. The first equation involves two parameter estimates and hypothesizes that ***F7*** *degree of end-user participation in IS integration activities* is a function of *F9 provisions for training due to the integration* and *F10 provisions to address IS employee morale as a result of the merger*:

$$\mathbf{F7} = \beta_1 F9 + \beta_2 F10 + \text{Residual}1$$

The second equation involves three parameter estimates and hypothesizes that **F5** quality of IS integration planning is a function of F10 provisions to address IS employee morale as a result of the merger, F2 quality of merger planning, and F4 degree of IS participation in merger planning:

$$\mathbf{F5} = \beta_3 F10 + \beta_4 F2 + \beta_5 F4 + \text{Residual}2$$

The third equation involves two parameter estimates and hypothesizes that **F8** quality support to users during integration is a function of F4 degree of IS participation in merger planning and F6 quality of communication of IS integration activities to user areas:

$$\mathbf{F8} = \beta_6 F4 + \beta_7 F6 + \text{Residual}_3$$

The fourth equation involves three parameter estimates and hypothesizes that **IS Capability** is a function of *F7 degree of end-user participation in IS integration activities*, *F5 quality of IS integration planning*, and *F8 quality support to users during integration*:

$$\mathbf{IS\ Capability} = \beta_8 F7 + \beta_9 F5 + \beta_{10} F8 + \text{Residual}_4$$

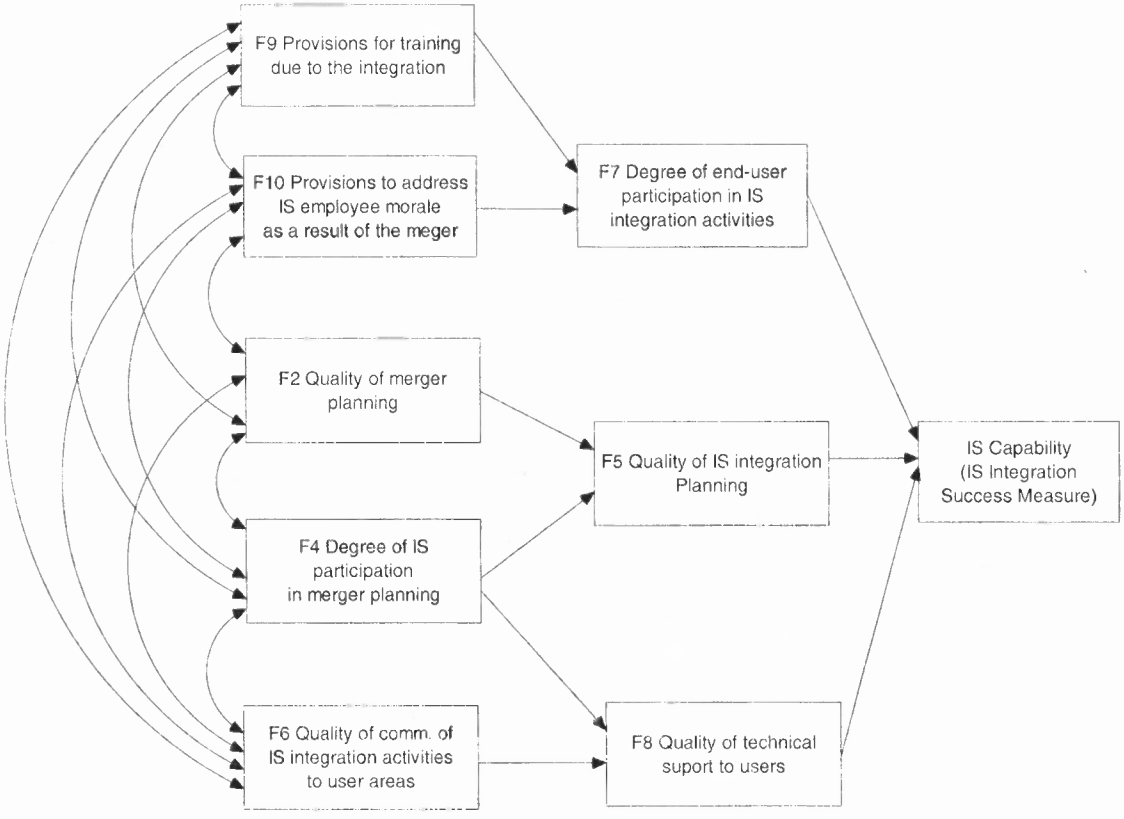


Figure 5.3 Factors indirectly influencing IS capability.

To identify the relationship between the two factors directly influencing **IS Performance** (***F2*** *quality of merger planning* and ***F3*** *quality of communication of merger activities to IS*) and the remaining eight factors in the Conceptual Model (Chapter 3, Figure 3), two multiple regressions were run. The multiple regressions used each of the two factors in turn, F2 and F3, as the dependent variable, and the remaining eight factors at once as the independent variables, while controlling for respondent bias (*perceived merger success*). The results are summarized and beta coefficients are presented in Appendix H, and indicate that *F1 executive (non-IS) management support for IS integration activities*, *F5 quality of IS integration planning*, *F10 provisions to address IS employee morale as a result of the merger*, and *F6 quality of communication*

of IS integration activities to user areas significantly contribute to ***F2*** *quality of merger planning* (Appendix H, Table 4), and that *F6 quality of communication of IS integration activities to user areas* also significantly contribute to ***F3*** *quality of communication of merger activities to IS* (Appendix H, Table 5). The double arrows between the exogenous variables in the model reflect the correlation among factors, as outlined in Appendix G, Table 1. The hypothesized path model predicting IS Performance is shown in Chapter 5, Figure 4.

The hypothesized path model being proposed to explain the relationship among the factors influencing **IS Performance** (Chapter 5, Figure 4) consist of three simultaneous equations. The first equation involves three parameter estimates and hypothesizes that ***F2*** *quality of merger planning* is a function of *F1 executive (non-IS) management support for IS integration activities*, *F5 quality of IS integration planning*, and *F10 provisions to address IS employee morale as a result of the merger*:

$$\mathbf{F2} = \beta_1 F1 + \beta_2 F5 + \beta_3 F10 + \text{Residual}_1$$

The second equation involves one parameter estimate and hypothesizes that **F3** *quality of communication of merger activities to IS* is a function of *F6 quality of communication of IS integration activities to user areas*:

$$\mathbf{F3} = \beta_4 F6 + \text{Residual}_2$$

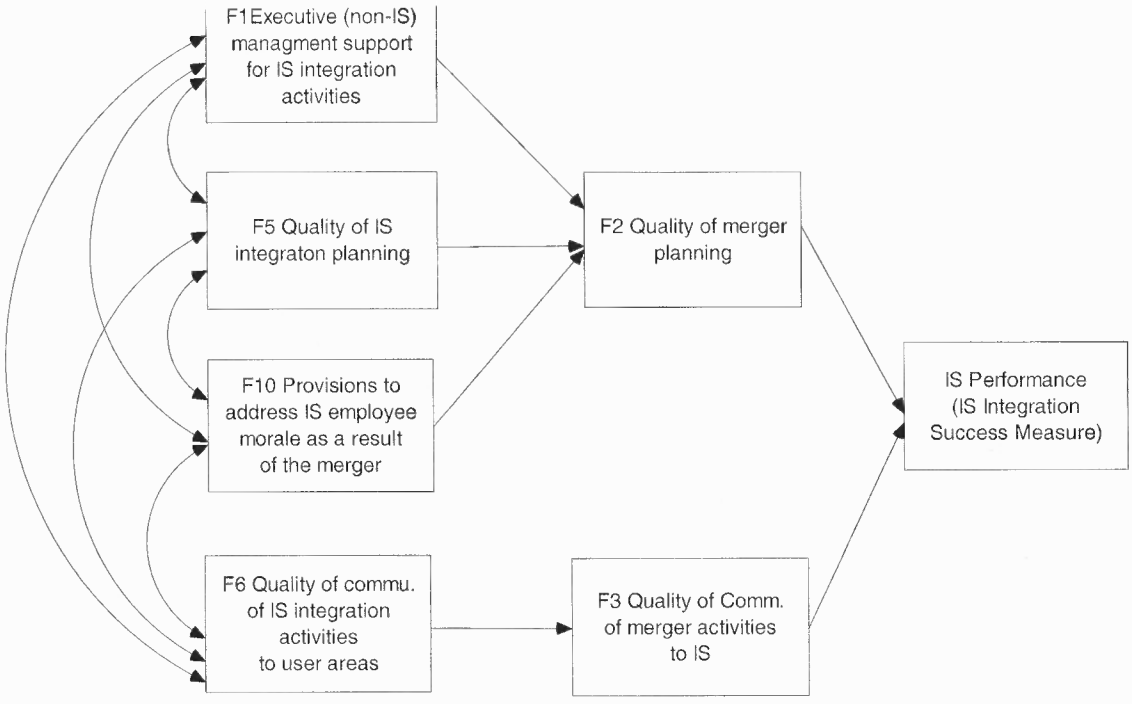


Figure 5.4 Factors indirectly influencing IS performance.

The third equation involves two parameter estimates and hypothesizes that **IS Performance** is a function of *F2 quality of merger planning* and *F3 quality of communication of merger activities to IS*:

$$\textbf{IS Performance} = \beta 5F2 + \beta 6F3 + \text{Residual3}$$

5.7.1.2 Path Models Testing. The two hypothesized path models (Chapter 5, Figure 3 and Figure 4) were tested using the study data described earlier. As discussed earlier, the study data met the assumption of normality, which is critical for structural equation modeling because non-normal data could result in overstated goodness-of-fit statistics (Shook, et al., 2004). The data was analyzed using the software program AMOS 16.0,

one of the notable software packages for structural equation modeling. AMOS has been widely used by researchers across different fields and has appeared in the top-tiered management journals (e.g., Capron, 1999; Cordano, Frieze, 2000; Hoegl, Gemuenden, 2001).

The final hypothesized path models predicting IS Capability and IS Performance and the corresponding parameter estimates from the analysis output are shown in Chapter 5, Figure 5 and Figure 6, respectively.

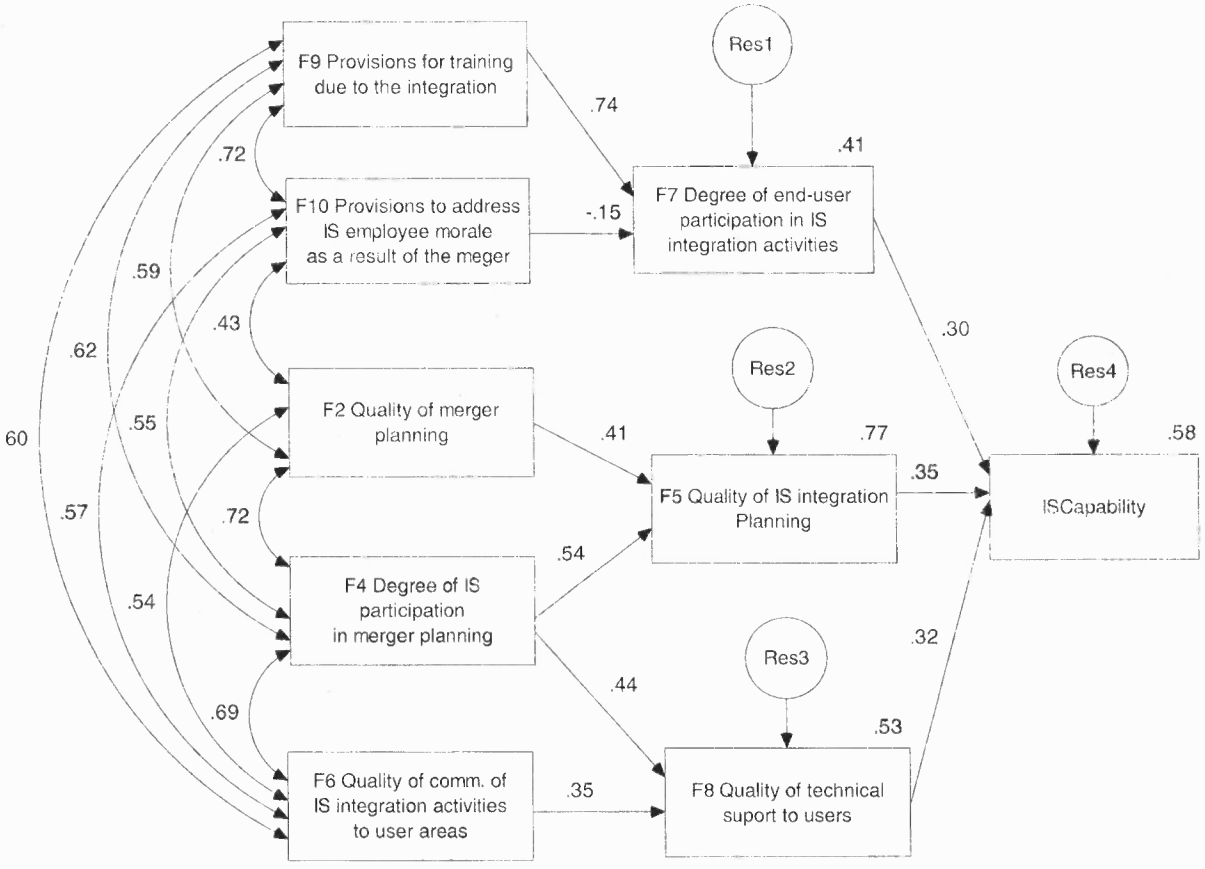


Figure 5.5 Hypothesized path model predicting IS capability.

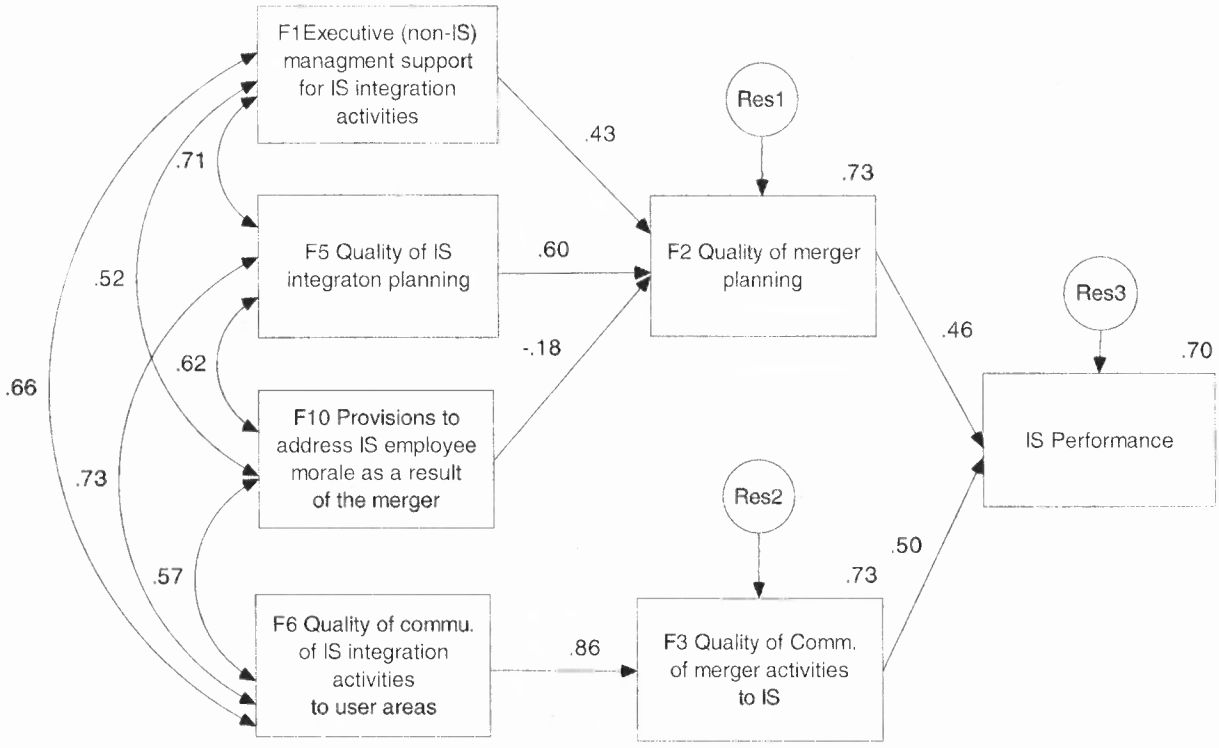


Figure 5.6 Hypothesized path model predicting IS Performance.

Structural equation modeling provides information about individual parameters or paths of the model. The analysis output for the parameter estimates in the hypothesized path model for **IS Capability** is presented in Chapter 5, Table 2. Individual parameters can be assessed based on three criteria (Byrne, 2001). The first criteria is that the parameter coefficients should have the correct sign as hypothesized, and a size that is less than or equal to 1. From Chapter 5, Table 2, it is clear that all factor loadings (standardized estimates), except for the loading of parameter F7 ← F10 which is discussed in Chapter 6, are positive and within the size guidelines, agreeing with the positive direction predicted in the main-effect hypotheses. The second criteria to assess the parameters is that the standard errors should be of appropriate size, neither extremely large nor approaching zero. All standard errors in Chapter 5, Table 2 also meet the

criteria. The third and last criteria is the statistical significance of the estimates, which in this type of analysis is the critical ratio, and is equivalent to the parameter estimate divided by its standard error. The guideline for statistical significance, based on a level of .05, is a critical ratio of > ± 1.96. All estimates' critical ratios, with the exception of parameter F7 ← F10, show statistical significance. Together, these three assessments indicate that while most parameter estimates adequately support the hypothesized path model for IS Capability, the F7 ← F10 parameter estimate does not. The hypothesized IS Capability path model supports the indirect influence of *F4 degree of IS participation in merger planning*, *F6 quality of communication of IS integration activities to user areas*, and *F9 provisions for training due to the integration* on **IS Capability**. Thus it could be argued that main-effect hypotheses H4, H6, and H9 are indirectly supported.

The analysis output for the parameter estimates in the hypothesized path model for **IS Performance** is presented in Chapter 5, Table 3. In this case, the parameter coefficients also have a positive sign, with the exception of the coefficient for parameter F2 ← F10 which is discussed furthering Chapter 6, and a size that is less than or equal to 1, agreeing with the positive direction predicted in the main-effect hypotheses. The standard errors are neither extremely large nor approaching zero, except again for parameter F2 ← F10. All estimates' critical ratios, with the exception of parameter F2 ← F10 (C.R. = -2.67), show statistical significance, i.e. C.R. > ± 1.96. Combined, these three assessments indicate that while most parameter estimates adequately support the hypothesized path model for IS Performance, the F2 ← F10 parameter estimate does not support it. The hypothesized path model for IS Performance supports the indirect influence of *F1 executive (non-IS) management support for IS integration activities* and

F6 quality of communication of IS integration activities to user areas on IS Performance. Thus it could also be argued that main-effect hypotheses H1 and H6 are indirectly supported.

Table 5.2 Path Model Analysis Output: Parameter Estimates (IS Capability)

AMOS Output: Parameter Estimates for the Regression Weights (Chapter 5, Figure 5)

Parameter	Nonstandardized Estimate	Standardized Estimate	Standard Error	Critical Ratio	*p*
F7 ← F9	.87	.74	6.69	.13	***
F7 ← F10	-.16	-.15	-1.33	.12	.18
F5 ← F2	.49	.41	5.98	.08	***
F5 ← F4	.59	.54	7.96	.07	***
F8 ← F4	.32	.44	4.68	.07	***
F8 ← F6	.29	.35	3.70	.08	***
ISCapability ← F5	.20	.35	4.25	.05	***
ISCapability ← F7	.19	.30	4.31	.04	***
ISCapability ← F8	.28	.32	4.07	.07	***

Note. *** $p < 0.001$

Table 5.3 Path Model Analysis Output: Parameter Estimates (IS Performance)

AMOS Output: Parameter Estimates for the Regression Weights (Chapter 5, Figure 6)

Parameter	Non-Standardized Estimate	Standardized Estimate	Standard Error	Critical Ratio	*p*
F2 ← F10	-.18	-.18	-2.67	.07	.01
F2 ← F1	.44	.43	5.85	.07	***
F2 ← F5	.50	.60	7.41	.07	***
F3 ← F6	.79	.86	16.73	.05	***
ISPerformance ← F2	.35	.46	7.04	.05	***
ISPerformance ← F3	.44	.50	7.69	.06	***

Note. *** $p < 0.001$

Of greatest interest in structural equation modeling is the goodness of fit of the entire model (Byrne, 2001). The model summary for each hypothesized path model in the output provided by AMOS is presented in Chapter 5, Table 4 and Table 5.

Table 5.4 Path Model Analysis Output: Model Summary (IS Capability)

AMOS Output: Model Summary (IS Capability)

The model is recursive.

Sample size = 102

Computation of degrees of freedom

Number of distinct sample moments:	54
Number of distinct parameters to be estimated:	37
Degrees of freedom (54 – 37):	17

Minimum was achieved

Chi-square = 65.30
Degrees of freedom = 17
Probability level = .00

Table 5.5 Path Model Analysis Output: Model Summary (IS Performance)

AMOS Output: Model Summary (IS Performance)

The model is recursive.

Sample size = 102

Computation of degrees of freedom

Number of distinct sample moments:	35
Number of distinct parameters to be estimated:	26
Degrees of freedom (35 – 26):	9

Minimum was achieved

Chi-square = 29.60
Degrees of freedom = 9
Probability level = .00

The output shows that the sample size is 102. In both models, the "minimum was achieved," which relates to model identification. Only models that are identified can be empirically tested (Byrne, 2001). To satisfy the requirement of model identification, a unique set of parameter estimates must be observable. For the hypothesized IS Capability path model, the summary in Chapter 5, Table 4 shows that the chi-square statistic is X^2 (17, N=102) = 65.30, p = 0.00, where 17 is the degrees of freedom. For the hypothesized IS Performance path model, the summary in Chapter 5, Table 5 indicates a chi-square statistic of X^2 (9, N = 102) = 29.60, p = 0.00. The chi square statistic should be used as a descriptive index, rather than a statistical test (Stevens, 2002) and reflects whether the covariance matrix reproduced in the model differs from the covariance matrix of the sample. In contrast to traditional significance testing, the researcher usually prefers a non-significant chi-square (Shook, et al., 2004). This is because the null hypothesis, Ho, states that the covariance matrix reproduced in the model and the covariance matrix of the population are equal, thus the researcher hopes not to reject Ho (Stevens, 2002). In the case of both hypothesized path models in this analyses, a significance of 0.00 indicates that the errors are significant and Ho must be rejected, indicating that the hypothesized path models may not be congruent with the observed data, and signaling that the models may be inadequate. Although the chi-square statistic is the most common goodness of fit measure reported in structural equation modeling, researchers argue that its applicability is limited by its sensitivity to sample size and its reliance on a centrally distributed chi-square (Byrne, 2001). The comparative fit index, CFI, compares the covariance matrix predicted by the model to the observed covariance matrix, and compares the null model with the observed covariance matrix to

measure the percent of lack of fit that is accounted for by going from the null model to the proposed SEM model (Tabachnick, Fidell, 2001). CFI and root mean square error of approximation (RMSEA) are among the measures least affected by sample size (Fan, et al., 1999). The CFI ranges from 0 to 1, with a CFI close to 1 indicating very good fit (Hu, Bentler, 1999). For the proposed hypothesized path models, a CFI of .93 for the IS Capability model (Chapter 5, Table 6) and a CFI of .97 for the IS Performance model (Chapter 5, Table 7) indicate very good fit.

Table 5.6 Path Model Analysis Output: CFI (IS Capability)

AMOS Output: Model Summary – Baseline Comparisons (IS Capability)

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.91	.76	.93	.81	.93
Saturated model	1.00		1.00		1.00
Independence model	.00	.00	.00	.00	.00

Table 5.7 Path Model Analysis Output: CFI (IS Performance)

AMOS Output: Model Summary – Baseline Comparisons (IS Performance)

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.95	.85	.97	.89	.97
Saturated model	1.00		1.00		1.00
Independence model	.00	.00	.00	.00	.00

The RMSEA is a measure of the closeness of fit, with values less than 0.05 indicating good model fit or good approximation, and values up to 0.08 indicating reasonable model fit (Browne, Cudeck 1993; Hu, Bentler 1999). Steiger (1990), Browne and Cudeck (1993), and MacCallum, et al. (1996) suggest that a confidence interval (CI) be calculated which should include values between 0 and 0.05 to indicate the possibility

of good fit. LO 90 and HI 90 are the lower and upper ends of a 90% confidence interval on this estimate. PCLOSE is the *p* value testing the null that RMSEA is no greater than .05 (Byrne, 2001). For the hypothesized path models for IS Capability and IS Performance, Tables 5.8 and 5.9 indicate and RMSEA of .17 and .15 for each model, respectively, suggesting poor model fit.

Table 5.8 Path Model Analysis Output: Model Fit RMSEA (IS Capability)

AMOS Output: Model Fit RMSEA (IS Capability)

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.17	.13	.21	.00
Independence model	.39	.36	.41	.00

Table 5.9 Path Model Analysis Output: Model Fit RMSEA (IS Performance)

AMOS Output: Model Fit RMSEA (IS Performance)

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.15	.09	.21	.00
Independence model	.46	.43	.49	.00

The mixed results regarding the hypothesized path models' fit suggest that further research is required to identify potential sources influencing the fit indices and to further explore the relationship among factors in the models predicting IS Capability and IS Performance.

5.7.2 Respondents Opinions – Top Three Positive/Negative Factors

Although not hypothesized, employing a 7-point semantic differential scale, the survey asked participants to assess the relative importance of IS integration to the overall success of the merger (question 9), and the role of the target company's IS function in the decision to merge (question 8). Descriptive statistics indicate that low consideration was given to the target company's IS function in the firms decision to merge (M=2.90, SD= 1.82). Results also indicate that respondents moderately agree that the IS integration is relatively important to the success of the merger (M=4.82, SD=1.69). The results are summarized in Appendix D, Table 15.

Additionally, the questionnaire asked participants to optionally identify the top three issues/factors that had a positive impact on the overall IS integration (question 19). Based on the responses received, Appendix D, Tables 8 through 10 provide the comprehensive list of response categories for Positive Factors 1, 2, and 3. Frequencies indicate that 64.7% of respondents opted to provide 1 positive factor, and among the 1st positive factors were quality planning (12.7%), quality communication (3.9%), and top management support (3.9%). On a 7-point semantic differential scale, respondents were also asked to assess how significant the first factor was to the overall IS integration. Overall, they thought the first positive factor was significant (*M*=5.95, *SD*=.86). 51% of respondents opted to provide a 2nd positive factor, with the top categories including quality planning (4.9%), quality communication (3.9%), structured integration plan (3.9%), and common technology platforms (3.9%). Participants indicated that the 2nd positive factor was also significant (*M*=6, *SD*=.85) to the overall IS integration. Finally, 40.2% of participants opted to provide a 3rd factor which they thought positively

influenced the overall IS integration. Among the top response categories in the 3rd positive factor was top management support (3.9%), quality planning (2.9%), and retaining key personnel (2.9%). Respondents indicated that the 3rd positive factor was also significant (*M*=5.65, *SD*=.95).

The questionnaire also asked respondents to optionally identify the top three issues/factors that had a negative impact on the overall IS integration (question 20). Based on the responses received, Appendix D, Table 11 through 13 provide the comprehensive list of the response categories for negative factor 1, 2, and 3. Frequencies indicate that 64.7% of respondents opted to provide 1 negative factor, and among the 1st negative factor were different technology platforms (8.8%), poor planning (7.8%), poor communication (6.9%), and poor integration (5.9%). On a 7-point semantic differential scale, participants indicated that the 1st negative factor was significant (*M*=5.37, *SD*=1.13). 43.1% of respondents opted to provide a 2nd negative factor, with top response categories including resistance to change (3.9%), staff lacking knowledge (2.9%), poor communication (2.9%), poor due diligence (2.9%), and unreasonable timeframe (2.9%). Participants indicated that the 2nd factor was also significant (*M*=5.38, *SD*=1.21). Lastly, 33.3% of participants opted to provide a 3rd factor which they thought negatively influenced the overall IS integration. Among the top categories in the 3rd negative factor were different technology platforms (8.8%) and resistance to change (3.9%). Respondents also considered the third negative factor significant (*M*=5.23, *SD*=1.46). Chapter 5, Table 10 summarizes all analyses presented in this chapter and applied to the study data.

Table 5.10 Analyses Plan Summary (including location in SPSS variable view)

Analysis Component	Variable	Survey Question	Analysis
Respondent Characteristics Merger profile data Respondents perception on the IS function's role in the decision to merger, the importance of the IS integration, the top three positive and top three negative factors impacting the overall IS integration & their importance	1. Title at time of IS integration 2. Years of IS management experience 3. Years of experience with IS integrations 4. Years of merger experience 5. Respondent's company line of business 6. Other company line of business 7. Year when the merger was completed 8. Respondent's company role in the merger 9. Company experiencing any other merger around the same time 10. IS function's role in the companies' decision to merge 11. Perceived relative importance of the IS integration to the overall merger success 12. Perceived top three positive factors impacting the overall IS integration & the importance of each 13. Perceived top three negative factors impacting the overall IS integration & the importance of each	1. Q21 (row 59) 2. Q22 (row 60) 3. Q23 (row 61) 4. Q24 (row 62) 5. Intro, pg. 2 (row 3) 6. Intro, pg. 2 (row 5) 7. Intro, pg. 2 (row 6) 8. Intro, pg. 2 (row 7) 9. Intro, pg. 2 (row 8) 10. Q8 (row 31) 11. Q9 (row 32) 12. Q19 (ai,bi,ci) (row 47, 48, 49)—the 3 pos. factors 13. Q19 (a, b, c) (row 50, 51, 52)—the importance of each pos. factor 14. Q20 (ai,bi,ci) (row 53, 54, 55)—the 3 neg. factors 15. Q20 (a, b, c) (row 56, 57, 58)—the importance of each neg. factor	Descriptive statistics

Table 5.10 Analyses Plan Summary (including location in SPSS variable view) (Continued)

Analysis Component	Variable	Survey Question	Analysis
IS integration success measures	1. Improved IS capability outcomes 2. IS contribution to merger plan and budget 3. IS ability to exploit opportunities and avoid problems 4. IS resource utilization 5. IS integration success	1. Q1: a – l (rows 9-20) 2. Q2: a, b (rows 21-22) 3. Q4: a, b (rows 26-27) 4. Q3: a, b, c (rows 23-25) 5. 5 (row 28)	Confirmatory principal component factor analysis (PCA)—two factors emerged and were called IS Capability and IS Performance
Respondent bias (i.e. only those involved in a successful merger respond)	Independent: Perceived merger success Dependent: IS Capability IS Performance	Independent: Q6 (row29) Dependent: See H1 below	2 Pearson *r* correlations, based on the 2 factors emerging from PCA.
Respondent bias (based on data collection method)	Independent: Collection [method—paper vs. online] Dependent: IS Capability IS Performance	Independent: Collection (row 2) Dependent: IS Capability (row 71) IS Performance (row 72)	MANOVA
Scales' internal consistency	1. 2 IS Integration Success Measures subscales pertaining to each factor from the PCA. 2. Degree of IS participation 3. Quality of merger planning 4. Quality of technical support to users during integration 5. Provisions for training due to the integration	1. 2, pertaining items within Q1 – Q5 2. Q12: a,b (rows 36-37) 3. Q13: a,b (rows 38-39) 4. Q15&Q16 (rows 42-43) 5. Q18: a, b (rows 45-46)	Cronbach's alpha scores Composite scores

Table 5.10 Analyses Plan Summary (including location in SPSS variable view) (Continued)

Analysis Component	Variable	Survey Question	Analysis
H 1: Executive (non-IS) management support for IS integration activities influences post-merger IS integration success measures, such that greater executive (non-IS) management support for IS integration activities results in greater post-merger IS integration success measures.	Independent: Executive (non-Is) management support Dependent: IS Capability IS Performance	Independent: Q10 (row33) Dependent: IS Capability (row 71) IS Performance (row 72)	Multiple Regression & Forward Stepwise Regression (All ten independent variables entered at once, while each of the 2 IS Integration Success Measures factors' scores resulting from the PCA are entered at once)
H 2: Quality of merger planning influences post-merger IS integration success measures, such that greater quality of merger planning results in greater post-merger IS integration success measures.	Independent: Quality of merger planning Dependent: See H1	Independent: Composite score Q13: a,b (rows 38-39) Dependent: See H1	Multiple Regression & Forward Stepwise Regression
H 3: Quality of communication of merger activities to IS influences post-merger IS integration success measures, such that greater quality of communication of merger activities to IS results in greater post-merger IS integration success measures.	Independent: Quality of communication of merger activities to IS Dependent: See H1	Independent: Q11: b (row35) Dependent: See H1	Multiple Regression & Forward Stepwise Regression
H 4: Degree of IS participation in merger planning influences post-merger IS integration success measures, such that greater degree of IS participation in merger planning results in greater post-merger IS integration success measures.	Independent: Degree of IS participation in merger planning Dependent: See H1	Independent: Composite score Q12: a,b (rows 36-37) Dependent: See H1	Multiple Regression & Forward Stepwise Regression

Table 5.10 Analyses Plan Summary (including location in SPSS variable view) (Continued)

Analysis Component	Variable	Survey Question	Analysis
H 5: Quality of IS integration planning influences post-merger IS integration success measures, such that greater quality of IS integration planning results in greater post-merger IS integration success measures.	Independent: Quality of IS integration planning Dependent: See H1	Independent: Q13: c (row40) Dependent: See H1	Multiple Regression & Forward Stepwise Regression
H 6: Quality of communication of IS integration activities to user areas influences post-merger IS integration success measures, such that greater quality of communication of IS integration activities to user areas results in greater post-merger IS integration success measures.	Independent: Quality of communication of IS integration activities to user areas Dependent: See H1	Independent: Q11: a (row34) Dependent: See H1	Multiple Regression & Forward Stepwise Regression
H 7: Degree of end-user involvement in IS integration activities influences post-merger IS integration success measures, such that greater degree of end-user involvement in IS integration activities results in greater post-merger IS integration success measures.	Independent: Degree of end-user involvement in IS integration Dependent: See H1	Independent: Q14 (row41) Dependent: See H1	Multiple Regression & Forward Stepwise Regression
H 8: Quality of technical support to users during the IS integration influences post-merger IS integration success measures, such that greater quality of technical support to users during the IS integration results in greater post-merger IS integration success measures.	Independent: Quality of technical support to users during the IS integration Dependent: See H1	Independent: Composite score: Q15&Q16 (rows 42-43 Dependent: See H1	Multiple Regression & Forward Stepwise Regression

Table 5.10 Analyses Plan Summary (including location in SPSS variable view) (Continued)

Analysis Component	Variable	Survey Question	Analysis
H 9: Provisions for training due to integration influence post-merger IS integration success measures, such that greater provisions for training due to integration result in greater post-merger IS integration success measures.	Independent: Provisions for training due to integration Dependent: See H1	Independent: Composite score Q18: a, b (rows 45-46) Dependent: See H1	Multiple Regression & Forward Stepwise Regression
H 10: Provisions for addressing IS employee morale post merger influence post-merger IS integration success measures, such that greater provisions for addressing IS employee morale result in greater post-merger IS integration success measures.	Independent: Provisions for addressing IS employee morale Dependent: See H1	Independent: Q17 (row44) Dependent: See H1	Multiple Regression & Forward Stepwise Regression
H11-1. The degree of IS integration moderates the relationship between executive (non-IS) management support and IS integration success.	Independent: (1) Executive (non-Is) management support Product of (1) and (2) Moderator: (2) Degree of IS integration Dependent: See H1	Independent: (1)Q10 (row33) Q10 X Q7 (row33 X row30) Moderator: Q7 (row30) Dependent: See H1	Moderation regression
H11-2. The degree of IS integration moderates the relationship between quality of merger planning and IS integration success.	Independent: - (1) Quality of merger planning - Product of (1) and (2) Moderator: (2) Degree of IS integration Dependent: See H1	Independent: - (1) Composite score Q13: a,b (rows 38-39) - (1) X Q7 = (1) X row30 Moderator: Q7 (row30) Dependent: See H1	Moderation regression

Table 5.10 Analyses Plan Summary (including location in SPSS variable view) (Continued)

Analysis Component	Variable	Survey Question	Analysis
H11-3. The degree of IS integration moderates the relationship between quality of communication of merger activities to IS and IS integration success.	Independent: - (1) Quality of communication of merger activities to IS - Product of (1) and (2) Moderator: (2) Degree of IS integration Dependent: See H1	Independent: - (1) Q11: b (row35) - (1) X Q7 = (row35 X row30) Moderator: Q7 (row30) Dependent: See H1	Moderation regression
H11-4. The degree of IS integration moderates the relationship between degree of IS participation in merger planning and IS integration success.	Independent: - (1) Degree of IS participation in merger planning - Product of (1) and (2) Moderator: (2) Degree of IS integration Dependent: See H1	Independent: - (1) Composite core Q12: a, b (rows 36-37) - (1) X Q7= (1) X row30 Moderator: Q7 (row30) Dependent: See H1	Moderation regression
H11-5. The degree of IS integration moderates the relationship quality of IS integration planning and IS integration success.	Independent: (1) Quality of IS integration planning Product of (1) and (2) Moderator: (2) Degree of IS integration Dependent: See H1	Independent: (1) Q13: c (row40) (1) X Q7= row40 X row30 Moderator: Q7 (row30) Dependent: See H1	Moderation regression
H11-6. The degree of IS integration moderates the relationship between quality of communication of IS integration activities to user areas and IS integration success.	Independent: - (1) Quality of communication of IS integration activities to user areas - Product of (1) and (2) Moderator: (2) Degree of IS integration Dependent: See H1	Independent: - (1) Q11: a (row34) - (1) X Q7 = row34 X row30 Moderator: Q7 (row30) Dependent: See H1	Moderation regression

Table 5.10 Analyses Plan Summary (including location in SPSS variable view) (Continued)

Analysis Component	Variable	Survey Question	Analysis
H11-7. The degree of IS integration moderates the relationship between degree of end-user involvement in IS integration and IS integration success.	Independent: (1) Degree of end-user involvement in IS integration - Product of (1) and (2) Moderator: (2) Degree of IS integration Dependent: See H1	Independent: - Q14 (row41) - Q14 x Q7 = row41 X row30 Moderator: Q7 (row30) Dependent: See H1	Moderation regression
H11-8. The degree of IS integration moderates the relationship between quality of technical support to users during the IS integration and IS integration success.	Independent: Quality of technical support to users during the IS integration - (1) - Product of (1) and (2) Moderator: (2) Degree of IS integration Dependent: See H1	Independent: (1) Composite score: Q15 & Q17 (rows 42-43) - (1) X Q7 = (1) X row30 Moderator: Q7 (row30) Dependent: See H1	Moderation regression
H11-9. The degree of IS integration moderates the relationship between provisions for training due to integration and IS integration success.	Independent: - (1) Provisions for training due to integration - Product of (1) and (2) Moderator: (2) Degree of IS integration Dependent: See H1	Independent: - (1) Composite score Q18: a, b (rows 45-46) - (1) X Q7 = (1) X row30 Moderator: Q7 (row30) Dependent: See H1	Moderation regression
H11-10. The degree of IS integration moderates the relationship between provisions to address IS employee morale and IS integration success.	Independent: - (1) Provisions for addressing IS employee morale - Product of (1) and (2) Moderator: (2) Degree of IS integration Dependent: See H1	Independent: - Q17 (row44) - Q17 X Q7 = row44 X row30 Moderator: Q7 (row30) Dependent: See H1	Moderation regression

Table 5.10 Analyses Plan Summary (including location in SPSS variable view) (Continued)

Analysis Component	Variable	Survey Question	Analysis
Supplemental Path Model Analysis For IS Capability model	Dependent: F7 Degree of end-user participation in IS integration activities F5 Quality of IS integration planning F8 Quality of technical support to users during the IS integration Independent: Factors 1, 2, 3, 4, 6, 9, and 10	Dependent: F7 -Q14 (row41) F5 - Q13: c (row40) F8 - Composite score: Q15&Q16 (rows 42-43 Independent: Factors 1, 2, 3, 4, 6, 9, and 10	SPSS 16.0 Multiple Regression & AMOS 16.0 Structural Equation Modeling
Supplemental Path Model Analysis For IS Performance model	Dependent: F2 Quality of merger planning F3 Quality of communication of merger activities to IS Independent: Factors 1, 4, 5, 6, 7, 8, 9, and 10	Dependent: F7 -Q14 (row41) F5 - Q13: c (row40) F8 - Composite score: Q15&Q16 (rows 42-43 Independent: Factors 1, 2, 3, 4, 6, 9, and 10	Multiple Regression & AMOS 16.0 Structural Equation Modeling

CHAPTER 6

DISCUSSION

This empirical study investigates the influence of ten organizational and IS factors on the effectiveness of post-merger IS integration. It also explores whether the degree of IS integration moderates the relationship between the factors and post-merger IS integration success.

The ten factors were selected based on an in-depth review of the literature (Chapter 3, Table 1), and the criteria that the factors are prominent across various information systems contexts, are relevant to a post-merger IS integration, and can be influenced or controlled by the management teams responsible for the post-merger integration. The study's Conceptual Model (Chapter 3, Figure 3) shows all ten organizational and IS factors having a direct influence on post-merger IS integration success. The main-effect hypotheses claim that each factor influences IS integration success. The Conceptual Model also indicates that degree of IS integration is a moderator in the relationship between the factors and post-merger IS integration success. The moderation hypotheses posit that degree of integration moderates the relationship between each of the factors and IS integration success. While the multiple regression analyses support the role of all ten factors predicting post-merger IS integration success, the forward stepwise regression analyses support only five out of ten main-effect hypotheses. Subsequently, the path model analyses lend support to the indirect influence of four additional factors on post-merger IS integration success. Regarding the ten moderation hypotheses, support is found for only one of the moderation hypotheses.

This chapter discusses the study findings, as outlined in Chapter 5, and relevance and implication to the study's Conceptual Model and extant literature.

6.1 Post-Merger IS Integration Success

Before discussing the study factors and relevant findings, it is important to first address findings relevant to the multi-dimensional construct post-merger IS integration success, the dependent variable in the Conceptual Model used when testing the main-effect and moderation hypotheses. As discussed in Chapter 3, the multi-dimensional construct to measure IS integration success was operationalized by Stylinou et al. (1996) and Robbins and Stylinou (1996). To ensure that the measures for post-merger IS integration success were actually measuring the indicated underlying dimensions, and before the main-effect and moderation hypotheses were tested using the five measures as dependent variables, a principal components factor analysis was conducted. The results indicate that indeed the five measures consolidate into two underlying dimensions, termed IS Capability and IS Performance in all subsequent analyses. The two dimensions were named based on the questionnaire items that loaded the highest on each. The IS Capability subscale primarily includes 13 items measuring *IS ability to exploit opportunities as a result of the merger*, and *improved IS capability outcomes*, or the capabilities that the post-merger IS integration enables, i.e. shape or enable critical business strategies, provide integration of related technologies across the organizational units, provide corporate-wide information accessibility, provide good quality information, develop systems efficiently and effectively, etc. (see Chapter 3, Section 1.2 for the full list of *improved IS capability outcomes*). The IS performance subscale includes seven items measuring *IS contribution*

to the overall merger schedule and merger budget, or how IS is able to adhere to the merger timeline and allocated budget, *IS function resource utilization throughout the IS integration*, or how well the time, personnel, and financial resources are utilized during the integration process, *perceived IS integration success*, or how well the IS integration is perceived to perform, and the *IS function's ability to avoid merger-related problems*, or IS performance preventing potential merger-related problems. In other words, the IS performance measure assesses how the IS function 'performed' during the post-merger IS integration. Both subscales indicate 'excellent' measures (George, Mallery, 2003) with Cronbach's alpha coefficients of .96 and .92, respectively. Thus, for the remaining analyses, including hypotheses testing, post-merger IS integration success is measured through the IS Capability and IS performance dimensions.

As discussed in Chapter 3 regarding the post-merger IS integration success measures, the objective of this study was not to measure the success of particular information systems, but rather it was to assess overall post-merger IS integration success at the organizational level from the perspective of the management team. To that end, the study adapted the post-merger IS integration success measures that correlate to the "net benefits" dimension in the 2003 DeLone and McLean IS success model (Chapter 3, Figure 2), which measures the "effectiveness level" of IS success, i.e. the effect of the information emanating from a system on the receiver. In the 2003 DeLone and McLean IS Success Model, the net benefits dimension consolidate the 1992 DeLone and McLean's IS Success Model dimensions *individual impact* and *organizational impact* and capture impact measures such as work group impacts, inter-organizational and industry impacts, consumer impacts, and societal impacts (DeLone, McLean, 2003).

Similarly, in this study, the IS Capability measure consolidates into one category *IS ability to exploit opportunities as a result of the merger* and *improved IS capabilities outcomes* resulting from the post-merger IS integration effort. The IS Performance measure consolidates into one category *IS contribution to the overall merger schedule and merger budget*, *IS function resource utilization throughout the IS integration*, *perceived IS integration success*, and *IS function's ability to avoid problems resulting from the merger*. Researchers have commented on the difficulty of applying the DeLone and McLean IS Success Model in order to operationalize IS success in a specific research context. Jiang and Klein (1999) find that users prefer different success measures depending on the type of system being evaluated. Whyte et al. (1997) find that differences deriving from organizational, user, and systems variations can modify the view as to which success measures are important. In reviewing IS success measures, it is obvious that no single measure is intrinsically better than another, so the choice of success variable is often a function of the objective of the study, the organizational context, the aspect of the information system which is addressed in the study and the level of analysis, i.e. individual, organization, or society (Markus, Robey, 1988). This study extends the contributions by Stylinou et al. (1996) and Robbins and Stylinou (1999) by consolidating five post-merger IS integration success dimensions into two, namely IS Capability and IS performance, and by providing a specific research context in which the post-merger IS integration success measures can be applied, i.e. the organizational level of analysis, from the perspective of the management team.

6.2 The Factors

The results from multiple regression analyses clearly support the Conceptual Model's claim that together all ten factors positively influence post-merger IS integration success, with models using all ten organizational and IS factors at once significantly predict 66.3% of the variability in IS Capability (Appendix G, Table 4) and 75.8% of the variability in IS Performance (Appendix G, Table 6). While Stylianou, et al. (1996) and Robbins and Stylianou (1999) identify that each of the ten factors is significantly correlated with post-merger IS integration success, this study extends those findings by identifying that together all ten factors generate synergies that positively impact post-merger IS integration. The ten main-effect hypotheses claim that each of the ten individual factor influence post-merger IS integration success, a claim that multiple regression tests fully support for only five of the hypotheses.

Forward stepwise multiple regression analyses uncovered that instead of requiring all ten factors to predict post-merger IS integration success, more parsimonious models predicting IS Capability and IS Performance exist. The five main-effect hypotheses supported correspond to the five factors making up the more parsimonious models. The first parsimonious model predicting IS Capability includes three IS factors, namely *quality of IS integration planning, degree of end-user involvement in IS integration activities, and quality of technical support to users during the IS integration* (Appendix G, Table 4 and Table 3). This model is significant and explains 66.1% of the variability in IS Capability, virtually the same variability explained by the model utilizing all ten factors as predictors. In addition to the model being significant, each individual factor within the model significantly contributes to IS Capability. As a result, the three

hypotheses that posit that the aforementioned three factors have a positive influence on IS integration success are supported, namely hypotheses H5, H7, and H8 (Chapter 5, Table 1). The second parsimonious model predicting IS Performance involves organizational factors *quality of merger planning* and *quality of communication of merger activities to IS* (Appendix G, Table 6 and Table 5). The model and each of its factors are significant and explain virtually the same variance in IS Performance as the model with all ten factors as predictors. Thus, the two hypotheses claiming that these two factors have a positive influence on IS integration success are supported, namely hypotheses H2 and H3 (Chapter 5, Table 1). An interesting observation is that all three factors predicting IS Capability are *IS factors* and both factors predicting IS performance are *organizational factors*. This may be explained by the fact that the IS factors pertain to the context of the IS function and the IS integration process, and the IS Capability dimension measures the capabilities that the post-merger IS integration enables, e.g., provide integration of related technologies, provide good quality information, etc. (Chapter 6, Section 1). On the other hand, the organizational factors are relevant to the context of the entire organization, and the IS performance dimension focuses on how the IS function performed in the context of the entire organization, e.g., IS contribution to the overall merger schedule and merger budget, IS function resource utilization, etc., (Chapter 6, Section 1).

6.2.1 The Three Factors Predicting IS Capability

The three factors making up the forward stepwise regression model predicting IS Capability and the two factors making up the model predicting IS Performance concur with researchers which also find them to be important in the IS integration context, and in some cases, in different contexts. The first factor in the model predicting IS Capability, *quality of IS integration planning*, has been found to be important in the context of IS integrations, and it refers to the quality of IS integration planning activities. Vester (2002) supports that an acquisition could be successful by following a disciplined integration program based on best practices, and recommends a solid strategic foundation that explains the reason for the deal as the correct place to start customizing the integration process in order to capture maximum value. Lajoux (2006) indicates that acquirers should follow the classic wisdom of project planning, which is to prepare to plan, assess the current environment, define integration plan objectives, develop plans and identify resources, and validate the plan. Wijnhoven et al. (2006) find that after a merger contract is finalized, the IT departments are often expected to consolidate the systems as quickly as possible with minimal disruption to the business. Bailey (2001) indicates that if integration is required to meet the merger goals, managing the information technology integration risk associated with a merger is a major component in determining the ultimate success or failure of mergers. The problem that Buck-Lew, et al. (1992) and Stylianou, et al. 1996) find is that IS integration is often given insufficient priority in merger discussions, with the management seemingly focusing more on the strategic and organizational compatibility of the two firms and leaving the IS issue to a later state. To address these challenges successfully, Bailey (2001) indicates that the IS team leaders

should present a strong business case for participation in the earliest phase of the merger life cycle, as early participation is essential to set realistic expectations regarding achievement of economies of scale and to define the strategic role of the IS area in supporting effective business processes with the new organization. All these recommendations support the relevance and importance of a quality IS integration plan to facilitate post-merger IS integration success.

The second factor in the model predicting IS Capability is *degree of end-user involvement in IS integration activities*, which refers to the extent to which internal end-users of the post-merger information systems participate in IS-related integration activities. This factor has been found to be relevant in the context of IS integrations, IS development and traditional software engineering projects, and end-user computing. In the context of IS integrations, Robbins and Stylianou (1999) suggest that end-user involvement with post-merger related IS integration activities improves communication, where if end-users understand the process and problems associated with the post-merger IS integration and are able to provide input, an atmosphere of cooperation is created, allowing the IS department to more readily achieve its objectives. In the context of IS development and traditional software engineering projects, user involvement has been found to be a specific application of the management techniques of participative decision making and group problem solving (Ives, Olson, 1984). Robey and Farrow (1982) find that user participation improves systems by providing a more accurate and complete assessment of user information requirements, and that by avoiding the development of unacceptable or unimportant features. Lucas (1974) finds that it provides expertise about the organization the system is to support. Lucas (1974) and Robey and Farrow (1982)

find that end-user involvement improves user understanding of the system. Findings suggest that participation may lead to increased user acceptance by developing realistic expectations about system capabilities (Gibson, 1977), providing an arena for bargaining and conflict resolution about design issues (Keen, 1981), increasing system ownership by users (Robey, Farrow, 1982), diminishing user resistance to change (Lucas, 1974), and committing users to the systems (Lucas, 1974; Markus, 1983). User involvement is deemed key to avoiding software project failure (Jiang, et al., 2002), and key to success (Clavadetscher, 1998). Baroudi, et al. (1986) find that end-user involvement helps to deliver more relevant solutions to user problems and greater commitment to those solutions than when systems are developed without user involvement, contributing to both improvements in the technical performance of information systems and also enabling greater acceptance and use. Newman and Sabherwal (1996) and Hunton and Beeler (1997) suggest that user participation in software development projects improves the requirements determination process, leads to greater buy-in, and keeps users informed about progress. Hwang and Thorn (1999) find that it leads to higher levels of user satisfaction, system quality, and system usage. Doll and Torkzadeh (1989) recommend that end-user involvement in systems development may improve the quality of design decisions and applications developed, improve end-user skills in system utilization, develop user abilities to define their own information requirements, and enhance user commitment to and acceptance of the developed application. In the context of an end-user computing environment, Mann and Watson (1984), Athey and Zmud (1986), and Meador and Mezger (1984) agree that user involvement is expected to be particularly important in determining user satisfaction and improving decision making. The findings

in this study confirm that in addition to being relevant in the contexts of IS development/traditional software engineering projects and end-user computing, end-user involvement is also relevant and important in the context of post-merger IS integration.

The third and last factor in the new model predicting IS Capability is *quality of technical support to users during the IS integration*, which refers to the level of technical support given to the end-users during the post-merger IS integration. This study claims that this factor is important in the context of IS integrations as it may ultimately influence system use and user information satisfaction. It claims that it may ultimately affect systems use, as part of the work networks that affect subjective norm, the person's perception that most people who are important to the person think the person should or should not perform the behavior in question (Fishbein, Ajzen, 1975). Empirical evidence suggests that information technology usage is a key dependent variable in MIS research (DeLone, McLean, 1992). A number of studies have examined the effect of perceived usefulness and perceived ease of use on system usage and have found these to be important determinants of self-reported system use (Karahanna, et al., 1999). Karahanna, et al. (1999) find that for users of IS one of the second most important referent groups is local computer specialists, and that local computer experts, falling in the local computer specialist group, are a valuable source of assistance with potential problems and questions with the technology. Furthermore, Karahanna et al. (1999) indicate that sustained IS usage intentions may hinge on the efficacy of the local computer specialists in providing technical support. In terms of this study's claim that technical support to users during the IS integration may influence user information satisfaction, Joshi and Bostrom (1986) find that one of the three factors influencing user

information satisfaction is attitudes toward IS staff and services, which includes items such as time taken for development of new systems and relationship with IS staff. Joshi and Bostrom (1986) also indicate that attitudes towards IS staff and services is one the most dominant factors influencing user information satisfaction, with a correlation factor of .70. Technical support has the potential to influence user information satisfaction by impacting the attitude towards IS staff and services. Zmud (1983) indicates that the consequences of dissatisfaction can range from non-usage of the systems to sabotage. The findings in this study confirm its earlier claim that technical support to users is relevant to the post-merger IS integration process.

6.2.2 The Two Factors Predicting IS Performance

The two factors included in the parsimonious model predicting IS Performance, *quality of merger planning* and *quality of communication of merger activities to IS*, have been identified as being important in the contexts of post-merger IS integration, software engineering, and business-IS strategic alignment. The first factor, *quality of merger planning*, refers to the quality of a merger plan in identifying and addressing risks associated with the merger, as well as identifying the details critical to the success of the merger. Quality of merger planning has been identified to be relevant in the contexts of IS integrations and software engineering projects. Massimilian (2001) suggests that a quality merger plan considers in detail the level of integration required between the firms, and it also establishes the governance structures that would facilitate decisions relevant to the merger and communicates such structures to the firms. The plan also includes the due diligence activities that should take place prior to the merger and post merger, and

account for the resources that would make the firms' combination possible. Buono et al. (1985) indicates that a quality merger plan takes into account potential sources of merger failure, such as people issues and culture clashes and puts forth a plan to mitigate the risks of merger failure. Stylianou et al. (1996) find that quality of merger planning appears to be an important contributor to the success of the integration process, contributing to the ability to exploit merger opportunities while avoiding problems in merging the IS processes. Larsson et al. (2001) indicate that quality merger planning can help mitigate intangible losses associated with a merger, namely losses associated with experience/memory, motivation, commitment, and competence. In the context of software engineering projects, Wallace and Keil (2004) indicate that execution risks have a significant relationship with product outcome, where execution risks include inadequate project staffing, inappropriate development methodology, failure to define roles and responsibilities, and poor project planning and control,. Thus, managers concerned with meeting schedule deadlines and budget limitations must find ways to reduce the risks associated with project execution. Wallace and Keil (2004) suggest that managers have very high level of control over these risks, concurring with the claim in this study that quality of merger planning is a factor that can be controlled by management teams.

The second factor in the model predicting IS Performance is *quality of communication of merger activities to IS*, which refers to the quality of communication from business areas to the IS areas regarding merger activities. Communication has been found to be relevant in the contexts of software engineering projects and IS/business alignment. In the context of software engineering projects, Mohtashami et al. (2006) identify that collaborative communication is one of the risk factors for collaborative

software development projects, and also one of the most important factors for collaborative development. In this context, Mohtashami et al. (2006) find that communication adds value and efficiency to collaborative efforts, but to be effective, communication must have high information content, must be continuing and bidirectional, and must support personal and business relationships as well as technical content. In the context of IS/business alignment, Boynton et al. (1994) indicate that effective application of IS depends on the interactions and exchanges that bind IS and line managers. Littlejohn (1996) suggests that as communication increases it is more likely that group members will share common ideas. Rockart et al. (1996) contribute that communication ensures that business and IS capabilities are integrated into the business effectively. Lind and Zmud (1991) indicate that there is empirical support for the connection between frequency of the communication and convergence in understanding. Based on the findings in this study, communication is confirmed to be relevant in a post-merger IS integration context.

An argument could be made that forward stepwise regression analyses require a larger sample size than the 102 responses achieved in this study. Tabachnick and Fidell (2001) suggest a 40 to 1 ratio of cases to independent variables, or 400 cases for this study with ten factors as predictors. However, the sample size of 102 cases was sufficiently large for all the multiple regressions to be statistically significant beyond the .01 level. The large effect sizes for these parsimonious models, which explain a variability of 66.1% for the model predicting IS Capability and 76% for the model predicting IS Performance, indicate that there are strong relationships among these

variables and those relationships are evident in spite of a sample of 102 cases. A larger sample size would only help to amplify those relationships.

6.3 The Moderator: Degree of IS Integration

While the results from statistical tests support five out of ten main-effect hypotheses, the tests only support one of the ten moderation hypotheses. The moderation hypotheses posit that the degree of IS integration moderates the relationship between the factors and post-merger IS integration success. Indeed, the data does support that the *degree of IS integration* moderates the relationship between *executive (non-IS) management support for IS integration activities* and IS Capability, where degree of IS integration refers to the extent to which the IS components between the merging firms are combined as a result of the merger, and executive (non-IS) management support refers to the extent to which the senior business management team supports IS integration-related activities. However, even in the model where the interaction variable including degree of IS integration and executive management support was found to be significant (Appendix G, Table 8), the findings do not support the study's theory that the relationship between the organizational and IS factors and IS integration success will be stronger when the degree of IS integration is higher, due to the additional analysis and higher complexity of the integration. Quite the opposite, the findings show that the relationship between executive (non-IS) management support for IS integration activities and IS Capability is actually weaker at high degrees of IS integration, and strongest at lower degrees of IS integration. This means that executive (non-IS) management support for IS integration activities is most influential at a low degree of IS integration, and least influential at a high degree of

IS integration. Said slightly different, at a low degree of IS integration, an increase in executive (non-IS) management support leads to a larger increase in IS Capability, than at a high degree of IS integration. This finding was surprising and one potential explanation is that when there's a lower degree of IS integration, the complexities in the merger environment are few, in which case the executive management support may actually be more influential, where under higher degrees of integration, there may be some many complexities around people, systems, and processes, for example, that the executive support may have very little significance. Statistics indicate that in acquired companies, 47% of executives leave within the first year, and 75% leave within the first three years (Galpin, Herndon, 2007). In this type of environment, it is possible that other factors, such as IS integration planning and merger planning are more significant than executive (non-IS) management support. This rationale is supported by the hypothesized path model in Chapter 5, Figure 6, where executive (non-IS) management support for IS integration activities directly influences quality merger planning, which in turn influences IS Performance. The finding pertaining to the moderating role of degree of IS integration on the relationship between executive (non-IS) management support and post-merger IS integration success is unique, as previous studies in the field have addressed related topics, however, none were found to have explored the role of degree of IS integration. For example, Johnston and Yetton (1996) identify three IT merger strategies and models of change, namely coexistence (maintaining different configurations), absorption (of one configuration by the other), and best of breed (new integrated configuration). Giacomazzi, et al. (1997) identify six different integration strategies that correspond to the final configuration of the applications (software) and the architecture of the new IS,

and group these six IS integration strategies into three main classes of behavior which include total integration, partial integration, and no integration. Chapter 2, Table 1 summarizes four prominent IS integration strategies based on the aforementioned findings, namely co-existence, absorption, best of breed, and transformation. The literature seems to suggest that degree of IS integration is driven by the IS integration strategy, with complexity increasing from the co-existence strategy, where integration is minimized to establishing communications components among the companies, to the transformation strategy, where the adoption of a new system requires the type of effort associated with an enterprise-wide IS project, which can be laborious and time consuming to plan and execute. In this study, the data does not support the original claim that degree of IS integration is a moderator in all relationships between the factors and post-merger IS integration success, or that the higher the degree of IS integration, the higher the moderation effect would be, however, it makes a contribution to the IS field by uncovering that executive (non-IS) management support for IS integration activities is most influential at a low degree of IS integration and least influential at a high degree of IS integration higher the degree of IS integration.

6.4 New Hypothesized Path Models

Findings from main-effect hypotheses testing have implications worth discussing. The Conceptual Model relying on all ten factors to predict post-merger IS integration success is supported. However, at first glance, the more parsimonious models, which explain virtually the same variance in IS Capability and IS Performance as the model using all ten factors, suggest that only the aforementioned five factors have an influence on post-

merger IS integration success. A closer examination of the correlations between the factors (Appendix G, Table 1) suggests that a more complex relationship may exist between the five influential factors and the remaining ones, which the literature also supports as influencing post-merger IS integration success. This thought process evoked the supplemental path model analysis presented in Chapter 5, Section 7.1. The findings from such analysis can be used to argue that four of the remaining ten factors indirectly influence post-merger IS integration success, thus lending indirect support to four of the main-effect hypotheses (Chapter 5, Table 1).

In the supplemental path model analyses (Section 5.7.1), due to lack of a priori theory predicting how the ten factors relate to each other, two hypothesized path models predicting IS Capability and IS Performance are built using a sequential series of regressions and are tested using structural equation modeling. As suspected, between the two hypothesized path models (Chapter 5, Figure 5 and Figure 5.6) all ten factors are reflected as either directly or indirectly influencing IS Capability or IS Performance. Although the model fit analyses for the two hypothesized path models generated mixed results, as will be discussed shortly, the two models advance the body of research and provide the basis for future work. The relationships expressed by the hypothesized path models predicting IS Capability and IS Performance are described below.

6.4.1 The Hypothesized Path Model for IS Capability

In the hypothesized path model predicting IS Capability (Chapter 5, Figure 5), eight out of ten factors are reflected as having a direct or indirect link to IS Capability. Based on the results described in Chapter 6, Section 2, Chapter 5, Figure 5 shows a direct influence

between IS factors *F5 quality of IS integration planning*, *F7 degree of end-user participation in IS integration activities*, and *F8 quality of technical support to user during the IS integration* and IS Capability, indicating a 58% correlation. The model also shows five exogenous variables having an indirect influence on IS Capability. Those variables reflect these five factors, in order from top to bottom, as they appear on Chapter 5, Figure 5: F9 provisions for training due to the integration, F10 provisions for addressing IS employee morale as a result of the merger, F2 quality of merger planning, F4 degree of IS participation in merger planning, and F6 quality of communication of IS integration activities to user areas.

First, starting from top to bottom, the hypothesized IS Capability path model displays factors F9 provisions for training due to the integration and F10 provisions for addressing IS employee morale as a result of the merger significantly correlated to *F7 degree of end-user participation in IS integration activities* (41%). The correlation coefficient between F9 provisions for training due to the integration and F10 provisions for addressing IS employee morale as a result of the merger is .72.

Second, the hypothesized IS Capability path model (Chapter 5, Figure 5) shows factors F2 quality of merger planning and F4 degree of IS participation in merger planning significantly correlated with *F5 quality of IS integration planning* (77%). It also shows a correlation coefficient of .72 between F2 quality of merger planning and F4 degree of IS participation in merger planning.

Third, and lastly, the hypothesized IS Capability path model (Chapter 5, Figure 5) portrays factors F4 degree of IS participation in merger planning and F6 quality of communication of IS integration activities to user areas significantly correlated with *F8*

quality of technical support to user during the IS integration (53%). The correlation coefficient between F4 degree of IS participation in merger planning and F6 quality of communication of IS integration activities to user areas is .69.

The Indirect Influences on IS Capability. The exogenous variables in the model (Chapter 5, Figure 5) appear to have an indirect, positive influence on IS Capability, which include factors F9 provisions for training due to the integration, F10 provisions for addressing IS employee morale as a result of the merger, F2 quality of merger planning, F4 degree of IS participation in merger planning, and F6 quality of communication of IS integration activities to user areas. The only exception is F10 provisions for addressing IS employee morale as a result of the merger. This factor, in particular, is part of the only parameter in the model that has a negative parameter weight, and is the only parameter that was found to be insignificant, suggesting that further investigation into its role is merited by future, relevant research. As indicated earlier, although previous studies have not predicted the relationship between the factors, these factors have been associated with success in various contexts.

In the hypothesized IS capability model (Chapter 5, Figure 5), exogenous factor F9 Provisions for training due to the integration refers to the availability of training , or formal efforts to transfer required IS knowledge to both business users and IS staff as a result of the post-merger integration. Training plays a very important role in end-user computing (EUC), may also play a role in enhancing an employee's education level, may be viewed as a way to improve employees' self-efficacy, and provides end-users and IS staff with conceptual and procedural knowledge about the target system.

Regarding the role that training plays in end-user computing, Dickson et al. (1984), Zmud and Lind (1985), Hartog and Herbert (1986), and Harrison and Rainer (1992) identifiy end-user training as a critical factor, and the most effective mechanism for ensuring the success of EUC. Cheney et al. (1986) also link the availability of end-user training programs with the success of EUC satisfaction. Sein et al. (1987) indicate that the success or failure of EUC within an organization will ultimately depend on whether end-users effectively use EUC software. White and Christy (1987), Brancheau and Wetherbe (1987), and Rivard and Huff (1988) suggest that basic and advanced training should be integral elements of any strategy designed to enhance end-user efficiency and effectiveness. Sein et al. (1987) find that structure training programs contribute to the development of an accurate initial mental model encompassing certain vital and essential part of the software, while Norman (1986) and Owen (1986) propose that mental models are then constantly refined and perfected through the users' continuous interaction with the system.

In terms of training playing a role in enhancing an employee's education level, Nelson and Nelson (1987) indicate that education involves an understanding of abstract theory, and training pertains to gaining the skills necessary to accomplish a task. However, this study claims that training can help enhance the user's knowledge base and can increase the user's education related to information systems usage. Davis and Davis (1990) find that end-users with higher levels of education perform significantly better in training environments than those with less education. Igbaria and Parasuraman (1989) report education to be negatively related to computer anxiety, and positively correlated

with computer attitudes. Lucas (1978) find that less educated individuals possess more negative attitudes toward information systems than individuals with more education.

Relevant to training being viewed as a way to improve employees' self-efficacy, Compeau and Higgings (1995) indicate that end-user training may help improve computer self-efficacy, the judgment of one's capability to use a technology (e.g., computer) to accomplish a particular job or task. In the context of computer use and a variety of computer behaviors, studies have found evidence of a relationship between self-efficacy and registration in computer courses at universities (Hill, et al., 1987), adoption of high technology products (Hill, et al., 1986), innovations (Burkhardt, Brass, 1990), and performance in software training (Gist, et al., 1989; Webster, Martocchio, 1992, 1993).

Finally, regarding training, Venkatesh (1999) suggest that IS training provides end-users and IS staff with conceptual and procedural knowledge about the target system, and thus plays an important role in influencing the formation of user perceptions and attitudes towards the new technology. Empirical IS research supports that training significantly increases procedural knowledge, which in turn affects perceived ease of use (Venkatesh, Davis, 1996). Training also affects attitudes (Raymond, 1990), usage (Schewe, 1976; Fuerst, Cheney, 1982; Lee, 1986; DeLone, 1988; Igbaria, et al., 1989; Kraemer, et al., 1993), and has a positive relationship with the acceptance of IT within an end-user environment (Cronan, Douglas, 1990).

In this study (Chapter 5, Figure 5), F9 provisions for training due to the integration appears to have a strong, positive influence (.74 beta weight) on *F7 the degree of end-user participation in IS integration activities*, which as discussed in Chapter 6,

Section 2, has a direct, positive influence on IS Capability. This relationships support earlier findings. The relationship could be explained by the aforementioned benefits of training in enhancing end user computing (EUC), EUC satisfaction, end-user education level related to IS usage, computer self-efficacy, conceptual and procedural knowledge about the target systems, and acceptance of IT within and end-user environment. The findings suggest that end-users who are more comfortable with the IS environment have a good attitude towards Technology, and are more satisfied with their ability to use Technology, thus, they are more likely to participate in IS-related integration activities.

In the hypothesized IS capability model (Chapter 5, Figure 5), exogenous factor **F10 provisions for addressing IS employee morale as a result of the merger** refers to the measures taken to enable IS employees' ability to maintain belief in the organization after the merger occurs, and to minimize departures of key personnel. Employee morale may be addressed by focusing on controlling negative factors, such as resistance and anxiety caused by the merger, and empowering employees.

First, regarding resistance to address IS employee morale, Buono et al. (1985) and Sales and Mirvis (1984) find that resistance results in lower commitment and cooperation among acquired employees. Hambrick and Canella (1993), Lubatkin et al., (1999) suggest that it leads to greater turnover among acquired managers. Chatterjee et al. (1992) identifies that resistance leads to a decline in shareholder value at the acquiring firm, while Very et al. (1997) and Weber et al. (1996) link resistance to deterioration in operating performance at the target firm. Larsson et al. (2001) indicate that employee resistance can occur at many levels, such as cultural clashes at the collective level, communication breakdowns and negative rumors at the interpersonal level, as well as

negative psychological and career implications at the individual level. Larsson et al. (2001) point to the risk of potential intangibles losses such as experience, memory, motivation, commitment, and competence.

Similarly, to address IS employee morale, Schweiger and Denisi (1991) indicate that management should communicate with employees as soon as possible regarding the anticipated affects of the change, and that not addressing the anxiety that follows a merger or acquisition announcement will increase uncertainty and employees' willingness to rely upon rumors, which can further increase anxiety. Such uncertainty and anxiety can lead to dysfunctional outcomes such as stress, job dissatisfaction, low commitment, low trust in the organization, and increase intentions to leave the organization (Ashford, et al., 1989; Buono, et al., 1985; Marks, Mirvis, 1983; Robino, DeMeuse, 1985; Schweiger, Ivancevich, 1985; Shirley, 1973).

Lastly, in addressing IS employee morale, Dunker (1994) proposes that empowerment is a tool to maximize the morale and productivity of its employees and suggests keys to empowerment within a computer consulting department. These keys include creating trust, assigning responsibility, listening, employee importance, team building, idea recognition, praise, flexible controls, direction, communication, knowledge, resource availability, and support.

In this study (Chapter 5, Figure 5), F10 provisions for addressing IS employee morale as a result of the merger displays a small, negative influence (-.15 beta weight) on *F7 the degree of end-user participation in IS integration activities*, which as discussed in Chapter 6, Section 2, has a direct, positive influence on IS Capability. This finding contradicts previous studies which have addressed potential dysfunctional behavior that

could result from employees' resistance and anxiety after a merger announcement. Furthermore, this study reveals that the parameter F7 ← F10 is insignificant (Chapter 5, Table 2), suggesting that it is target for further analysis and potential removal in future research. Even then, the possibility that F10 provisions to address IS employee morale as a result of the merger may be removed in the hypothesized IS Capability path model requires further exploration to help explain why it is not significant in this context, when it has been found to be in the past, for reasons stated earlier.

In the hypothesized IS Capability path model (Chapter 5, Figure 5), exogenous factor **F2 quality of merger planning** appears to have a strong, positive relationship with *F5 quality of IS integration planning* (.41 beta weight). A detailed discussion regarding the relevance of this factor is provided in Chapter 6, Section 2.2, as it is one of the two factors that have a positive, direct influence on IS Performance. In this study, the relationship between F2 quality of merger planning and F5 quality of IS integration planning points to the importance of a quality merger plan, which among other things should identify the details critical to the success of the merger, consider in detail the level of integration required between the firms Massimilian (2001), and contribute to the ability to exploit merger opportunities, while avoiding problems in merging the IS processes (Stylianou, et al., 1996).

It is interesting to highlight that in both the IS Capability and IS Performance hypothesized path models, F2 quality of merger planning and F5 quality of IS integration planning take turns in sequence to directly influence IS Capability and IS performance. In each model, the two factors take turn being the dependent and independent variables. However, the beta weight from F5 quality of IS integration planning to F2 quality of

merger planning is higher (.60) than the beta weight from F2 to F5 (.41), suggesting that of the two, F5 quality of IS integration planning has a larger influence on F2 quality of merger planning. This finding makes a great deal of sense, because as discussed earlier, the IS integration is one of the major areas of potential risks to successful merger integration.

In the hypothesized IS capability model (Chapter 5, Figure 5), exogenous factor **F4 degree of IS participation in merger planning** refers to the level to which the IS team takes part in merger planning activities. This participation is conducive to the IS teams achieving the merger objectives throughout the lifecycle of the merger. Lederer and Burky (1988) find that IS executives who participate in business planning believe that they have a better understanding of executive management's objectives than those who participate less. Reich and Benbasat (2000) and Zmud (1988) indicate that the level of alignment between business and IS teams is influenced by connections between business and IS planning processes. Planning activities occur throughout the lifecycle of a merger, and the literature supports the participation of IS teams throughout the merger lifecycle (Chapter 2, Section 7 and Table 2.4). Robbins and Stylianou (1999) suggest that IS participation in high quality merger planning is an important contributor to the success of the integration process, contributing to the ability to exploit merger opportunities while avoiding problems in merging the IS processes.

In this study (Chapter 5, Figure 5), F4 degree of IS participation in merger planning appears to have a strong, positive influence on both *F5 quality of IS integration planning* (.54 beta weight) and *F8 quality of technical support to users* (.44 beta weight). These relationships support the aforementioned findings. As it relates to F5 quality of IS

integration planning, being part of the merger planning would allow the IS team to understand merger goals, objectives, timelines, resources availability, and constraints around the integration, enabling the IS team to plan to meet expectations. Regarding F8 quality of technical support to users, IS participation in merger planning would help the IS team assess the potential needs around end-user technical support and coordinate technical training programs that would address those needs.

Finally, in the hypothesized IS capability model (Chapter 5, Figure 5), exogenous factor **F6 quality of communication of IS integration activities to user areas** refers to the quality of communication from the IS areas to the business areas regarding IS integration activities. In the context of mergers, Robbins and Stylianou (1999) indicate that good communication between IS teams and end user areas regarding the progress of the merger activities helps generate understanding and support from the end-user constituency. Good communication has also been associated with system development projects and the innovation diffusion process.

Regarding the role of communication in system development projects, DeBrabander and Thiers (1984) identify that communications between developers and users is a factor conducive to computer-based systems implementation success or failure. Edstrom (1977) indicates that symptoms of ineffective communication between computer specialists and users are consistently related to user dissatisfaction with the system, and this appears to be true for communication problems at all phases of the system development process. Nah and Delgado (2006) identify communication as being critical to an Enterprise Resource Planning (ERP) project implementation, where the primary

purpose of such communication is to set expectations and share goals effectively among stakeholders and throughout all levels of the organization.

Lastly, in addressing the role of communication in diffusion of innovation, Ebadi and Utterback (1984) and Chakrabarti et al. (1983) note that diffusion of innovations can be affected by both sources of information and channels of communication. Chakrabarti et al. (1983) define an information source as a medium in which knowledge/information is stored, while a communication channel is defined as a means by which information is moved from one point to another. In the context of innovation in research and development organizations, Allen et al. (1979) and Hauptman (1986) show the importance of project team communication with both external and internal sources on implementation of innovation.

In this study (Chapter 5, Figure 5), F6 quality of communication of IS integration activities to user areas shows a positive influence on *F8 quality of technical support to users* (.35 beta weight). This relationship supports previous findings and suggests that in a post-merger integration environment, quality communication of IS integration activities to user areas promotes mutual understanding between the IS team and the business teams. This enables IS teams to identify user need for technical support around the systems that are being introduced due to the merger, or that have changed as a result of the IS integration or merger.

6.4.2 The Hypothesized Path Model for IS Performance

In the hypothesized path model predicting IS Performance (Chapter 5, Figure 6), six out of ten factors are reflected as having a direct or indirect link to IS Performance. Based on the results described in Chapter 6, Section 2, Chapter 5, Figure 6 shows a direct influence between organizational factors *F2 quality of merger planning* and *F3 quality of communication of merger activities to IS* and IS Performance, indicating 70% correlation. The model also shows four exogenous variables having an indirect influence on IS Capability. The variables reflect these four factors, in order from top to bottom, as they appear on Chapter 5, Figure 6: F1 executive (non-IS management support for IS integration activities, F5 quality of IS integration planning, F10 provisions for addressing IS employee morale as a result of the merger, and F6 quality of communication of IS integration activities to user areas.

First, starting from top to bottom, the hypothesized IS Performance path model displays factors F1 executive (non-IS management support for IS integration activities, F5 quality of IS integration planning, and F10 provisions for addressing IS employee morale as a result of the merger significantly correlated with *F2 quality of merger planning* (73%). The correlation coefficient between F1 executive (non-IS management support for IS integration activities and F5 quality of IS integration planning is .71. The correlation coefficient between F1 executive (non-IS) management support for IS integration activities and F10 provisions for addressing IS employee morale as a result of the merger is .62, and between F5 quality of IS integration planning and F10 provisions for addressing IS employee morale as a result of the merger it is .52.

Lastly, the hypothesized IS Performance path model (Chapter 5, Figure 6) shows factors F6 quality of communication of IS integration activities to user areas significantly correlated with *F3 quality of communication of merger activities to IS* (73%).

The Indirect Influences on IS Performance. The exogenous variables in the hypothesized IS Performance path model (Chapter 5, Figure 6) include factors F1 executive (non-IS) management support for IS integration activities, F5 quality of IS integration planning, F10 provisions for addressing IS employee morale as a result of the merger, and F6 quality of communication of IS integration activities to user areas. With the exception of F10 provisions for addressing IS employee morale as a result of the merger, all factors in the model appear to have an indirect, positive influence on IS Performance. As started earlier, previous studies have not predicted the relationship between the factors, however, these factors have been associated with success in various contexts. Chapter 5, Section 2.1 outlines previous findings associated with F5 quality of IS integration planning. Chapter 6, Section 4.1.1 describes previous findings related to F10 provisions for addressing IS employee morale as a result of the merger, as well as F6 quality of communication of IS integration activities to user areas. However, each of these factors, along with F1 executive (non-IS) management support for IS integration activities, which will be discussed shortly, can be viewed uniquely in the context of the hypothesized path model predicting IS performance.

In the hypothesized IS Performance path model (Chapter 5, Figure 5), exogenous factor **F1 executive (non-IS) management support for IS integration activities**, as stated earlier, refers to the extent to which the senior business management team supports

IS integration related activities. This factor has been found to have a positive influence in different research contexts, including software engineering projects, the deployment of IS innovations, and IS project management.

Regarding the role of executive management support within a software engineering context, executive management support has been found to positively influence the development and implementation of management information systems (Jarvenpaa, Ives, 1991), system development projects (Lee, 1986; Leitheiser, Wetherbe 1986), and data warehousing projects (Wixon, Watson, 2001). Yoon et al. (1995) find it to influence expert systems success. Soliman et al. (2001) suggest that it has a positive influence on the integration of computer-aided design/computer-aided manufacturing systems with resource planning systems.

In the context of IS innovations, Jarvenpaa and Ives (1991), Kwon and Zmud (1987), Leonard-Barton and Deschamps (1988), and Purvis et al (2001) have examined the effect of a wide range of factors on successful implementation, and in particular have identified management support as a critical factor in the implementation of IS innovations. Sharma and Yetton (2003) indicate that substantial material and management resources are required to not only develop IS applications and infrastructures, but also to support end-users during implementations, and that such resources are more likely to be forthcoming when the change enjoys management support.

Relating to the role of executive management support in IS project management, Mahaney and Lederer (1999) also find management support to be significant in the context of runaway projects. As a component of IS integration leadership, Schweiger et

al. (1987), Brown et al. (2003) and Datta (1991), recognize executive support as being important.

In this study (Chapter 5, Figure 6), F1 executive (non-IS) management support for IS integration activities shows a strong, positive influence on *F2 quality of merger planning* (.43 beta weight). This finding concurs with previous studies, and in this context it is not surprising, as the merger planning requires top business leaders to set direction, identify merger goals and objectives, and actively provide financial and human resources required for successful integration.

In the hypothesized IS Performance path model (Chapter 5, Figure 6), exogenous factor **F5 quality of IS integration planning** refers to the quality of IS integration planning activities, and appears to have a strong, positive relationship with *F2 quality of merger planning* (.60 beta weight). A detailed discussion regarding the relevance of this factor in previous studies is provided in Chapter 6, Section 2.1, as it is one of the three factors that has a positive, direct influence on IS Capability. In this study, the relationship between F2 quality of merger planning and F5 quality of IS integration planning, as portrayed in the hypothesized IS Capability path model and the IS Performance model, points to the mutual influence the factors have on one another. However, as noted earlier, the IS Performance model suggests that F5 quality of IS integration planning has a bigger influence on F2 quality of merger planning, based on a .60 beta weight vs. a .41 beta weight. The converse of what was said earlier, while discussing F5 quality of IS integration planning, applies here. The influence of F5 quality of IS integration on F2 quality of merger planning highlights the importance of a quality IS integration plan, which among other things should identify the details critical

to the success of the merger as it relates to the IS integration, and consider in detail the goal of the merger to ensure that the IS integration plans are aligned with merger goals.

In the hypothesized IS Performance path model (Chapter 5, Figure 6), exogenous factor **F10 provisions to address IS employee morale as a result of the merger**, as discussed earlier, refers to the measures taken to enable IS employees' ability to maintain belief in the organization after the merger occurs, to minimize departures of key personnel, and appears to have a weak, negative relationship with *F2 quality of merger planning* (-.18 beta weight). A detailed discussion regarding the relevance of this factor in previous studies is provided in Chapter 6, Section 4.1.1. This finding contradicts previous studies and furthermore, in this study, the parameter F2←F10 is insignificant (Chapter 5, Table 5.3), suggesting that it is target for further analysis and potential removal in future research. But as stated earlier, even then, the possibility that F10 provisions to address IS employee morale as a result of the merger may be removed from the hypothesized IS Capability path model and the hypothesized IS Performance model requires further exploration to help explain why it is not significant in this context, when it has been found to be in the past, for reasons stated earlier.

Lastly, in the hypothesized IS Performance path model (Chapter 5, Figure 6), exogenous factor **F6 quality of communication of IS integration activities to user areas**, as stated earlier in Section 4.1, refers to the quality of information from IS teams to business areas regarding IS integration activities, and shows a very strong, positive influence (.86 beta weight) on *F3 quality of communication of merger activities to IS*. A detailed discussion regarding the relevance of this factor to previous studies is also presented Chapter 6, Section 4.1.1. This finding suggests that as important as F3 quality

of communication of merger activities to IS is to attaining IS Performance (beta weight .50), it is also of great importance to have F6 quality of communication of IS integration activities to user areas, signaling the overall significance of mutual communication between the IS and user areas

To conclude on the hypothesized path models, first, between the two models, all ten factors are represented, suggesting that all ten factors are important in predicting post-merger IS integration success. However, the lack of significance for the parameters that involve F10 provisions to address IS employee morale as a result of the merger signal that further investigation and analysis and is required. Secondly, with the exception of F10 provisions to address IS employee morale as a result of the merger, both models suggests strong relationships between the factors. In fact, in this study, for the hypothesized IS Capability path model, the lowest beta weight is .30 (for the parameter IS Capability ← F7 degree of end-user participation in IS integration activities), while for the hypothesized IS Performance path model, the lowest beta weight is .43 (for the parameter F2 quality of merger planning ← F1 executive (non-IS) management support for IS integration activities). Furthermore, the strong relationships between the endogenous and exogenous factors, as well as the strong correlations among the exogenous factors suggest that the underlying constructs may merit closer examination in the future.

6.4.3 The Goodness of Fit Indices

The goodness of fit tests for both hypothesized IS Capability and IS Performance models generated mixed results, where the chi square and root mean square error of approximation (RMSEA) statistics pointed to poor fit of the models, and the comparative fit index (CFI) signaled good fit. Problems with the proposed models may be a result of sample size or misspecified models, where the latter points to the aforementioned insignificant parameters, or those parameters including F10 provisions to address IS employee morale as a result of the merger. With regard to appropriate sample size, it is well established in the literature that structural equation modeling requires a large sample size, although recommendations of exactly how large the sample should be are inconsistent. Conservative estimates generally indicate 15 cases per measured variable (Bentler, Chou, 1987; Tabachnick, Fidell, 2001), while Quintana and Maxwell (1999) recommend a minimum of 200 participants. More liberal recommendations (Anderson, Gerbing, 1984) report that a sample size of 150 is sufficient for obtaining a proper solution. A conservative approach (15 cases per indicator times 9 indicators for the model of IS Capability) would include 135 respondents. The supplemental path model analysis explored how the ten factors relate to each other and to post-merger IS integration success. The findings create opportunities to respecify the models (Shook, et al., 2004) or modify the models (Stevens, 2002) to improve model fit.

6.5 Validity and Reliability

The statistical tests conducted on the respondents' characteristics as well as other relevant answers submitted by the respondents lend validity and reliability to the findings. In terms of validity, the descriptive statistics in this study (Appendix D, Table 1 through 5) indicate that the target audience was indeed reached. The survey participants were senior IS executives with experience in IS integrations and mergers, across different industries, mitigating the risk of external validity (Fink, 2003b), the risk that the sample is not representative of the target population. The risk to internal validity due to a lengthy survey was also mitigated, as the survey was conducted during the first four months of 2008. The mergers reported mainly occurred during 2005, 2006, and 2007, fairly recently to allow the respondents to recall the information (Appendix D, Table 6). A similar timeframe going back three years from the data collection year was used by Weber and Pliskin (1996).

To improve the findings reliability, two survey questions asked respondents to identify the top three factors that in their opinion had a positive and negative impact on the overall IS integration. The answers provided partially support the results obtained from the hypotheses testing analyses. Among the top three factors listed as having a positive impact on the overall IS integration were quality planning, quality communication, top management support, structured integration plan, common technology platforms, and retaining key personnel (Appendix D, Table 8, 9, and 10). From these, quality planning, which may include both merger planning and IS integration planning, and quality communication, which may include both communication from user areas to IS and vice versa, concur with results in this study. From the answers provided,

a structured integration plan could be interpreted to be implicitly part of a quality IS integration plan. Furthermore, from the supplemental path model analysis, the hypothesized IS Performance path model shows top management support as one of the factors having an indirect influence on quality of merger planning. Among the top three factors that respondents indicated had a negative impact on the IS integration were poor planning, poor communication, resistance to change, unknowledgeable staff, poor due diligence, unreasonable timeframes, and different technology platforms (Appendix D, Table 11, 12, and 13). In this case, the opposite of good planning and good communication make the list. Resistance to change would be addressed by the factor provisions to address IS employee as a result of the merger, poor due diligence and unreasonable time would be addressed by both factors quality merger plan and quality IS integration plan. Among the top three positive/negative factors, respondents included common technology platforms and different technology platforms. This factor cannot be controlled by management teams, where the team cannot directly or indirectly influence whether the technology platforms of the merged firms are the same or different, thus this type of factor is excluded from the factors considered by this study.

The responses to a survey question aiming to assess the relative importance of the IS integration to the overall merger success validate previous findings and confirm one of this study's premises that the IS integration is important to overall merger success. When asked about the relative importance of the IS integration to the overall success of the merger, respondents moderately agree that the IS integration is relatively important to the success of the merger (Appendix D, Table 15), concurring with Larsson and Lubatkin (2001), Lajoux and Weston (1998), Haspeslagh and Jeminson (1987), Ravenscraft and

Scherer (1989), and Massimilian (2001), and highlighting the importance of this research topic.

CHAPTER 7

CONCLUSION

7.1 Summary and Conclusion

The Influence of Organizational and Information Systems Factors on the Effectiveness of Post-Merger Technology Integration is a dissertation research study which focuses on examining the influence of four organizational and six information systems factors on post-merger IS integration success. Specifically, the factors are important in a variety of information systems contexts, are relevant to an IS integration, and most importantly, can be controlled by management teams, who can influence how the factors are manifested in the post-merger integration environment. The study also explores the role of degree of IS integration as a moderator in that relationship. The dependent variable, post-merger IS integration success, is conceptualized using a multi-dimensional construct and operationalized using five measures. However, after a factor analysis, and based on the underlying items making up the subscales, the five measures are consolidated into two, namely IS Capability and IS Performance. A self-administered survey instrument was used to collect data during the first four months of 2008. Data were collected from 102 senior IS executives at organizations which completed a U.S. public merger greater than $25 million between the years 2004 and 2007, as identified by the *Mergers & Acquisitions: The Dealermaker's Journal* and Lexis Nexis' Hoover's Company Records.

The four organizational factors considered in this study include 1) F1 executive (non-IS) management support for IS integration activities, 2) F2 quality of merger planning, 3) F3 quality of communication of merger activities to IS, and 4) F4 degree of IS participation in merger planning. The six IS factors of interest in this study are 1) F5

quality of IS integration planning, 2) F6 quality of communication of IS integration activities to user areas, 3) F7 degree of end-user participation in IS integration activities, 4) F8 quality of technical support to users during the IS integration, 5) F9 provisions for training due to the integration, and 6) F10 provisions for addressing IS employee morale as a result of the merger. The moderator in this study is degree of IS integration.

As it relates to all ten factors in unison predicting post-merger IS integration success, the study's Conceptual Model (Chapter 3, Figure 3) is supported. Initially, based on multiple regression analyses presented in Chapter 5, Section 6.1, five out of 10 hypothesized positive relationships between the factors and post-merger IS integration success were supported. The supported hypotheses includes factors 1) F2 quality of merger planning, 2) F3 quality of communication of merger activities to IS, 3) F5 quality of IS integration planning, 4) F7 degree of end-user participation in IS integration activities, and 5) F8 quality of technical support to users during the IS integration. Subsequently, based on path model analyses presented in Chapter 5, Section 7.1, all but one of the five remaining main-effect hypotheses were indirectly supported. The indirectly supported hypotheses include factors 1) F1 executive (non-IS) management support for IS integration activities, 2) F4 degree of IS participation in merger planning, 3) F6 quality of communication of IS integration activities to user areas, and 4) F9 provisions for training due to the integration. The main-effect hypothesis including F10 provisions to address IS employee morale as a result of the merger was not supported. The hypothesized moderation of degree of IS integration on the relationship between post-merger IS integration success and F1 executive (non-IS) management support for IS integration activities was supported. Furthermore, the data supports that F1 executive

(non-IS) management support for IS integration activities is most effective at low levels of IS integration, and least effective at high levels of IS integration. The remaining nine moderation hypotheses are not supported.

In a supplemental path model analysis that sought to identify the relationship among the factors, two hypothesized path models are developed and tested. The results indicate that a complex relationship exists between the aforementioned factors in this study and IS Capability and IS Performance. In the hypothesized path model predicting **IS capability** (Chapter 5, Figure 5), the following factors directly influence IS Capability: F5 quality of IS integration planning, F7 degree of end-user participation in IS integration activities, and F8 quality of technical support to users during the IS integration. Indirectly influencing IS Capability are factors: F2 quality of merger planning and F4 degree of IS participation in merger planning, which influence F5 quality of IS integration planning; factors F9 provisions for training due to the integration and F10 provisions for addressing IS employee morale as a result of the merger, which influence F7 degree of end-user participation in IS integration activities; and factors F4 degree of IS participation in merger planning and F6 quality of communication of IS integration activities to user areas, which influence F8 quality of technical support to users during the IS integration. In the hypothesized path model predicting **IS Performance** (Chapter 5, Figure 6), two factors directly influence IS Performance: F2 quality of merger planning and F3 quality of communication of merger activities to IS. Indirectly influencing IS Performance are factors: F1 executive (non-IS) management support for IS integration activities, F5 quality of IS integration planning, and F10 provisions for addressing IS employee morale as a result of the merger, which influence

F2 quality of merger planning are factors; and factor F6 quality of communication of IS integration activities to user areas, which influences F3 quality of communication of merger activities to IS. However, in both models the parameter that includes F10 provisions for addressing IS employee morale as a result of the merger proved to be insignificant, suggesting that it may be a target for removal in a future study.

This study informs the Conceptual Model (Chapter 3, Figure 3) by consolidating the five IS integration measures into two and by proposing two hypothesized path models (Chapter 5, Figure 2 and Figure 3) that attempt to explain the complex relationship between the factors and their influence on IS Capability and IS performance.

7.2 Limitations

The results of this research must be considered in light of various limitations associated with sample size, the quality of factor measures, self-reported dependent and independent variables, and the generalizability of the findings. First, the final research sample size in this study was 102 subjects. Given the ten factors involved in the analyses, the target sample size had been a conservative sample of 130 subjects ($N > 50 + 8m$, where m = number of independent variables) (Tabachnick, Fidell, 2001). The target sample of 130 responses was a conservative target, as Stevens (1996) recommends that 'for social science research, about 15 subjects per predictor are needed for a reliable equation.' For this study, that would have meant including approximately 150 subjects for the analyses. The main challenge in achieving the target sample size of 130 cases was the nature of the target sampling unit, particularly very busy IS executives and senior IS managers in organizations. In addition to having schedules that are highly constrained, this target

audience is also difficult to motivate. For example, many studies offer the study findings as an incentive to participate. However, high profile business professions have access to multiple sources of industry research (e.g., Gartner, Forrester, Cutter, etc.), making this method of incentive ineffective with this target audience. In terms of monetary or 'prize' incentives, IS executives belong to higher income segments in the population, making monetary incentives that would normally be effective with student audiences, for example, quite ineffective. Among other factors influencing the lack of response were company policies that prevented potential participants from answering the survey. Others indicated that they had not been involved in the particular merger, with some pointing out that they had joined the firm after the merger took place. The number of responses achieved in this study confirms the claim that few survey undertakings are as difficult as defining, sampling, contacting, and obtaining responses to self-administered questionnaires from businesses and other organizations (Dillman, 2000). The conflicting goodness of fit results from the hypothesized paths models may also be attributed to the sample size, where a conservative sample size for structural equation modeling would include 15 cases per measured variable (Bentler, Chou, 1987; Tabachnick, Fidell, 2001) or 135 cases (9 measured variables in the hypothesized IS Capability path model X 15).

A second limitation of this study is the nature of the measures for the independent variables—the factors. Out of the ten factors, five factors use single-item measures, and data were captured through surveys, not secondary sources, which would make the data more reliable. A single-item measure can raise questions associated with the reliability of the measure. As indicated when discussing the study's survey creation in Chapter 4, the dependent and independent variables are measured using scales previously validated by

Stylianou et al. (1996) and Robbins and Stylianou (1999). While single-item measures are not the most desirable, they are often used due to limitations regarding the availability of or difficulty in obtaining data. The challenges associated with collecting data from busy IS executives was just discussed as the first limitation in this study.

A third limitation or concern is that data for the dependent variable, post-merger IS integration success, and the independent variable, the factors, are collected through a survey instrument, which does not have the same objectivity as secondary sources, and from the same respondents at the same time, creating the potential for self-report bias. Unfortunately, because of the type of information being sought by this research, data to assess post-merger IS integration success and the factors in question could not be collected through any secondary sources. Had the study been seeking to measure merger success, for example, objective measures would have been available in that case. To name a few, those measures would have been based on: stock based returns (Jensen, Rubart, 1983), return on capital (Pennings, Barkema, 1994), value creation (Seth, 1990), long-term performance (Megginson, et al., 2002), stockholder risk (Chatterjee, Lubatkin, 1990), shareholder value (Chatterjee, et al., 1992), and ROA—return on asset (Ramaswamy, 1997). In addition, a related limitation is that IS integration success is being self-reported by members of the IS senior management team, not their business counterparts who may be more objective about the success of the IS integration. Above and beyond the limitation of reaching IS senior managers, reaching the appropriate business counterparts who have access to IS integration-related information could have further negatively impacted the response rate. In this research, there is a trade-off between data availability and reliability.

Finally, the fourth limitation is related to the generalizability of the findings. Based on the profile of the merger firms targeted, the findings of this study are only generalizable to U.S. public merger greater than $25 million. This suggests that researchers must be careful about applying these results to mergers smaller than $25 million, mergers occurring between U.S. and cross-border firms, and mergers occurring in the private sector. The characteristics of such mergers may very significantly based on economical, cultural, and regulatory factors, for example.

7.3 Implications for Future Research

This research is a stepping stone in helping to explain and understand how ten controllable factors in the Conceptual Model (Chapter 3, Figure 3) influence post-merger IS integration success. The findings uncover several topics worth exploring in future research. The findings show that strong relationships exist among the ten factors. One extension of this research would be to assess the factors' underlying constructs and explore whether some of them consolidate, generating a smaller number of factors. A consolidation of the factors may address the concern relevant to the factors' single-item measures. The path model analysis performed in this study using structural equation modeling can be repeated using the consolidated factors, and goodness of fit can be re-checked. The findings from such analysis may uncover a more parsimonious path model predicting IS Capability and IS Performance.

Another potential direction for this topic of research is the creation of an assessment tool for IS participation throughout the merger lifecycle based on best practices. The literature suggests that a gap exists between the role that the IS team

currently plays throughout the merger lifecycle and the role which the literature prescribes that the IS team should play in order to improve the performance of the post-merger IS integration and merger performance in general (Chapter 2, Table 4). This study built the theoretical foundation to develop a measurement tool to assess IS team participation throughout the different phases of the merger lifecycle, enabling management teams to identify and then improve upon how IS teams can add value throughout the merger process. The new IS team merger participation assessment tool would be analogous to the one developed by Barki and Hartwick (1994) to measure user participation during the system development lifecycle.

Furthermore, throughout this dissertation, the researcher makes several contributions to the IS field, which can be useful to researchers and future studies. Appendix A is a compilation and sample of merger research across a number of merger topics, including: M&A impact on human resources; M&A motives and characteristics; M&A impact on organizational performance; M&A integrations; and M&As and information systems. Chapter 2, Figure 1 provides a graphical summary of major merger research topics. The question marks on this figure indicate areas where academic research is scarce or non-existent, and where the researcher recommends additional research efforts. Finally, regarding the evolution of the role of the IS leader, Chapter 2, Table 3 expands on the references provided by Karimi et al. (1996) and enhances the original format by organizing the references in chronological order. This information may be valuable to researchers in IS management or strategic management disciplines, for example.

7.4 Implications for Professional Practice

Slow, poor, or lack of post-merger integration is partly responsible for merger failure (Lajoux, Weston, 1998; Worthen, 2007; Kitching, 1967; Ranft, Lord, 2002; Shrivastava, 1986). Given the prevalence of mergers in the corporate landscape, this research suggests that careful attention must be paid to the ten factors of interest in this study. Together, all ten factors are significant, but the way they are applied and integrated is of value. While five factors are found to have a direct influence on IS integration success, the findings suggest that four others have an indirect effect. The five factors having a direct influence on IS integration success are: quality of merger planning, quality of communication of merger activities to IS, quality of IS integration planning, degree of end-user participation in IS integration activities, and quality of technical support to users during the IS integration. The findings suggest that the following factors have an indirect effect: executive (non-IS) management support for IS integration activities, degree of IS participation in merger planning, quality of communication of IS integration activities to user areas, and provisions for training due to the integration.

While there are other factors that have significant influence on IS integration success, the factors identified by this study are those that can be controlled and planned for by management teams. In other words, the management teams have the ability to influence the factors in terms of how the factors are manifested in the post-merger IS integration environment. However, that is not to say that the factors of focus in this study are more important than others. Although this research is preliminary and future research is proposed to address certain study limitations and improve upon the findings, the

findings concur with previous studies that have found a link between these factors and IS success.

In this study, the survey respondents indicate that in 44.6% of the cases, their firms were undergoing more than one merger, suggesting that this is an area of research that should be supported, as firms engage in mergers multiple times throughout their lives (Haleblian, Finkelstein, 1999). In the competitive, global business environment in which firms operate today, growth and diversification by means of mergers or acquisitions is a viable strategic option. From this perspective, IS executives and other senior executives can benefit from expanding their knowledge as it relates to the factors and components that could potentially promote merger success and mitigate merger failure.

APPENDIX A

SUMMARY OF MAJOR THEMES IN THE MERGER LITERATURE

Compilation and sample of merger research across a number of merger topics: M&A impact on human resources; M&A motives and characteristics; M&A impact on organizational performance; M&A integrations; and M&As and information systems.

Table A.1 Summary of Major Themes in the Merger Literature

Study	Period	Method/Comments	Measures	Results/Suggestions
M&A impact on Human Resources				
Schweiger, Ivancevich, Power, 1987 *The Academy of Management Executive*	**n.a**	***Structured interviews*** ***Data Source***: *Fortune* manufacturing and service firms to identify employees ***Data 1***: 160 acquired employees ***Goal:*** To identify executive actions for managing HR before and after an acquisition.	Categories	• Identified categories to reflect major problems created by the acquisition, HR decisions that needed attention and action, and effective and ineffective management behaviors and actions in response to them.
Walsh, J. 1988 HR *Strategic Management Journal*	**1975-79**	***Surveys*** ***Sample 1 source***: Statistical Report on Mergers and Acquisitions, 1979, published by FTC in 1981 used to identify firms in manufacturing and mining ***Sample 1 size***: 130 executives, response rate: 55%, 42% useful ***Sample 2 Source:*** Standards and Poor's Stock Guide for control group (no M&A activity), NYSE and American Stock Exchange to identify firms ***Sample 2 size***: 30 companies ***Goal:*** To identify turnover rate patterns of senior executives of target companies based on the strategic purpose of the merger.	***Dependent***: Turnover rate ***Independent***: M&A activity Unrelated M&A	• Turnover rate of top executives of acquired firms was higher for each of the five years. • No statistically significant evidence that target's executive turnover is higher following a related M&A than an unrelated M&A. • Turnover rate of senior top managers are higher than their colleagues of lesser rank.
Buono and Bowditch,1989 *Book*	**n.a**	***Data Analysis*** ***Data Source:*** Field studies, interviews, organizational surveys, archival research ***Goal***: Research on M&As with emphasis on human resource considerations. Focus on the managerial decisions and actions that can aid the success and mitigate the failed efforts to merge the HR of two previously autonomous firms.	n.a.	M&As impact people at the workplace, evidenced by: • Psychological difficulties • Culture clashes • Communication breakdowns • Lowered commitment • Drop in productivity • Power struggles • Loss of key personnel

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
Schweiger, Denisi, 1991 *Academy of Management Journal*	n.a.	***Experiment, field study*** ***Sample Source***: Two plants engaged in light manufacturing belonging to one of two merging *Fortune* 500 companies ***Sample 1 size***: 75 employees in the experimental plant ***Sample 2 size:*** 72 employees in the control plant ***Goal***: To assess the impact that a merger announcement would have on the dependent variables, where a group receives merger communications and another does not. ***Comment:*** Data was collected at four different points in time throughout the merger: before the announcement of the merger, the day the company released the merger announcement, two weeks after the announcement, three days after beginning of preview program.	***Dependent:*** Perceived uncertainty Global stress, turnover Job satisfaction Organizational commitment Perceptions of the company's trustworthiness, honesty, and caring Intentions to stay with the organization Performance Absenteeism ***Independent:*** Merger announcement ***Control:*** Participation in merger preview program	• Results provide strong, empirical evidence that mergers do have a negative impact. • Uncertainty appears to increase, along with a rise in stress, and a decrease in satisfaction, commitment, intentions to remain with an organization, and perceptions of the organization's trustworthiness, honesty, and caring. • Results did not substantiate a decrease in performance or absenteeism. • Realistic communications during a merger process in the form of realistic merger preview can help employees get through the process by coping with the uncertainty of the situation and to insulate themselves from some associated dysfunctional outcomes. • The negative effects of M&As do not seem to go away with time, but seem to get more serious.
Datta, 1991 *Strategic Management Journal*	1/80-3/84	***Survey*** ***Sample Source***: Quarterly issues of *Mergers and Acquisitions* for acquisitions valued at $1 million or more in the U.S. manufacturing and mining sectors; Moody's Industrial Manuals and list of recent executive to cross check senior executives at acquiring firms ***Sample size***: 703 firms, included only completed acquisitions in data period and firms that were not later acquired themselves by 1986. Two mailings were conducted, 27% response rate. ***Goal***: To identify the impact of the independent variables on the acquisition performance. ***Comment:*** Some of the reasons for executives not participating included time pressures, company policies prohibiting this type of participation, and data confidentiality.	***Dependent:*** Acquisition performance (used accounting-based measures-ROI[1], EPS[2], stock price, cash flow, and sales growth) ***Independent:*** Differences in management style Differences in reward and evaluation systems Post-acquisition integration Low, High Relative size	• A negative relationship exists between differences in the management styles of the acquiring and acquire firms and post-acquisition performance. • In acquisitions characterized by high post-acquisition integration, there was a negative relationship between differences in management styles and post-acquisition performance. • In acquisitions characterized by low post-acquisition integration, differences in management styles are related to post-acquisition performance. • A negative relationship did not exist between differences in the reward and evaluation systems of the acquiring and acquired firms and post-acquisition performance.

[1] ROI=Return On Investment
[2] EPS=Earnings Per Share

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
Hambrick, Cannella, 1993 *Academy of Management Journal*	1980-84	***Data Analysis*** ***Data Source***: *Mergers and Acquisitions* to identify the largest 200 transactions reported in data period; Securities and Exchange Commission (SEC) 10K form reports to identify top executives of acquired firms; COMPUSTAT data to obtain data to calculate ROE; *Wall Street Journal* to distinguish between tender offers or mergers (for measures of social climate), and to identify statements from executive officers regarding their support or opposition to offers; expert informants, security analysts and acquiring firm officers, to assess autonomy; SEC filing to identify if acquired executive became an officer; 10K reports and Dun & Bradstreet's *Reference Book of Corporate Managements* for age data; judges to categorize business as related or unrelated, using the two firm descriptions from Moody's manuals; SIC codes provided by the Center for Research in Securities Prices for acquisitions used to examine categorizations provided by judges ***Data Size:*** 430 executives in 97 acquired firms ***Goal***: Using the concept of relative standing, or local social status, explain why some acquired executives leave. ***Comment:*** Used ROE (Return on common Equity) to measure pre-acquisition performance. Analyzed the results using five sub-periods, ranging from 0 – 48 months.	***Dependent:*** Acquired firm's ROE ***Independent:*** Executive departure Pre-acquisition performance Relative size Social climate (amicability to hostility) Removal of autonomy Status bestowal ***Control:*** Age Relatedness	• Show that the size of the bidder's capacity, demand volume, and volatility affect its valuation of the target in a significant and non-monotonic way. Changing any of these three characteristics can cause either an increase or a decrease in the target's value, depending on the values of other parameters. • Two-year executive departures was negatively associated with the acquired firm's pre-acquisition ROE and even somewhat more associated with their ROE relative to their acquirer's. • Friendly mergers were associated with the fewest executive departures and contested tender offers with the most. • Executives who were personally granted status were less likely to depart that were others. Those who were indirectly granted status were more likely to depart. • Neither the relative sizes of the acquired firms nor removal of autonomy showed a simple correlation with executive departures. • Executive age was positively associated with departures. • Relatedness showed no association with two-year executive departure • The fact that indicators of relative standing were somewhat more strongly related to two-year departure than to four-year departure is consistent with the expectation that effects of relative standing on departure would diminish over time. • More detailed results associated with the five sub-periods are available in the article.
Nahavandi, Malekzadeh, 1998 *Academy of Management. The Academy of Management Review*	n.a.	***Literature Review*** ***Goal***: Propose an interdisciplinary acculturation model of the planning and implementation of mergers as a strategic alternative.	***Dependent:*** Successful implementation ***Independent:*** How much do members of the acquired firm value preservation of their own culture (very much/not at all)	• Propose that the degree of congruence between the preferred modes of acculturation for the acquirer and the target company will affect the success of the implementation of the merger. • Suggest that a successful merger involves not only thorough financial and strategic analysis building, but also planning regarding congruence between the two companies' preferences about

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
			Perception of the acquirer's attractiveness (Very attractive/not at all attractive) Degree of multiculturalism Degree of relatedness of firms	the implementation strategy for the merger. • The concept of acculturation and congruence suggest that many of the problems associated with post-merger integration of two firms can be avoided or managed if they agree on the mode of acculturation. • Suggest that the various subcultures of the subgroups within the target organization must be understood by the acquirer, and that each may need to be managed differently. • Suggest testing the proposition.
Larsson, Driver, Holmqvist, Sweet, 2001 *European Management Journal*	**n.a.**	***Model introduction*** ***Goal***: To present a Career Concept approach to better understand and manage sources and incentives for individual contributions and reactions to M&As. The article outlines: career concepts and motives; career disruptions in M&A; the career question of voluntary exit or not; predicting career outcomes in M&A; individual career perceptions of different types of M&A; being acquired or the acquiring; hidden drains of intangible assets resulting from M&A; career re-integration opportunities for growing the intangibles; selecting co-competence .combinations; and co-motivational integration ***Comment:*** The model provides insights into the human side of M&A from the perspective of the individual.	n.a.	• Organizations face opportunity to select new combinations and integrate work in ways that individual careers can be re-integrated into the goals of the M&A with the goals and motivations of participants affected by it, by recognizing and effectively supporting different motivational and competence provides. • The Career Concepts model helps describe how individual careers can more or less disintegrate in M&A efforts, thus being a strong and hidden source of resistance, while the model can also provide guidance for re-integrating careers through a career-based understanding of M&A integration efforts. • By recognizing the different career concepts, motives, and competencies, it is possible to avoid both individual career threats and organizational drains as well as select co-competence combinations and implement co-motivational integration in order to achieve career reintegration and high co-performance in M&A.
Larsson, Lubatkin, 2001 *Human Relations*	**1959-88**	***Case Survey*** ***Sample Source***: M&A case catalogs, reference lists, computer searches, and bibliographies ***Sample size***: 50 US and Swedish cases ***Goal***: To identify how post-acquisition acculturation is affected by the independent variables.	***Dependent:*** Achieved acculturation ***Independent:*** Autonomy removal Merger relatedness Relative size Social controls	• The more closely related the merging firms, the smaller the acquired firm tends to be relative to the size of the buying firm. • US mergers are more likely to be unrelated than Swedish ones. • Related mergers appear to be associated with higher levels of social controls.

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
			Nationality (US/Sweden) Cross-nationality ***Control:*** Year	• Swedish mergers are associated with higher levels of social control than US mergers.
Weber, Camerer, 2003 *Management Science*	**n.a**	***Experiment*** ***Sample Source***: Students at the California Institute of Technology (Caltech) and Carnegie Mellon U. (CMU) who were recruited from a list of people interested in participating in experiments. They were paid their earnings in cash at the conclusion of the experiment. ***Goal***: To introduce a simple experimental paradigm to explore cultural conflict as a possible cause of merger failure. Specifically, the experiments explore what happens when two groups that have independently developed tacit share knowledge, which allows them to operate efficiently, need to combine their knowledge and anticipate how difficult it will be to do so.	***Dependent:*** Merger performance ***Independent:*** M&A event in lab	• Performance decreases following the merger. • Subjects overestimate the performance of the merger firm and attribute the decrease in performance to members of the other firms, rather than to situational difficulties created by conflicting culture .
M&A Motives/Characteristics				
Lubatkin, 1983 *Academy of Management. The Academy of Management Review*	**1971-80**	***Literature Review*** ***Data Source***: Strategic management and industrial organization literature ***Goal:*** Addresses the questions: do mergers provide real benefits to acquiring firms? If mergers do not, then why do firms continue to merge? If they do, then why have empirical studies found no evidence? ***Comments:*** Describes the three basic kinds of synergies: technical economies (e.g., same inputs produce higher outputs, thus reducing cost through efficiency, include marketing and production economies; pecuniary economies (market power through size); and diversification economies (improving performance relative to risk	n.a	• Literature, primarily in the field of industrial organizations, suggests that acquiring firms may benefit from merging because of technical, pecuniary, and diversification synergies. • Studies, almost exclusively in the field of finance, using performance measures from the capital asset pricing model, find that all the significant gains of merger go to the target firm. • However, these studies treat mergers as a homogeneous phenomenon, when mergers can lead to a range of possible outcomes contingent on the strategic fit between acquiring and target firm. The strategic management literature recognizes that mergers are not homogenous, but rather they can lead to a range of possible

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
		and vice versa).		outcomes contingent on the strategic fit between acquiring and target firm. • Suggests studies for integrating the techniques currently employed in empirical studies with the concepts developed in industrial organizations and strategic management literature in order to obtain a better understanding of merger activity.
Ravenscraft, Scherer, 1988 *International Journal of Industrial Organization*	**1975-77**	***Data Analysis*** ***Data Source***: U.S. FTC line of business surveys ***Data Size***: 2,732 lines of business operated by U.S. manufacturing corporations. ***Goal:*** Investigate the statistical support for the claim that mergers occur to displace inefficient managers and to achieve economies of scale and scope in production. ***Comment:*** Provides objective measures for identifying the strategic type of acquisition.	***Dependent:*** Post-merger profitability ***Independent:*** Pre-merger profitability	• No statistical evidence exist that target firms are profit under-performers. Rather they were found to be extraordinarily profitable, the more so the smaller their size. • Post-merger profitability declined except among pooling-of-interest merger partners of roughly equal pre-merger size.
Scott, 1989 *International Journal of Industrial Organization*	**1951** **1977-78**	***Case Study*** ***Data 1 source***: U.S. FTC 1980 report of two major conglomerate mergers ***Data 1 size:*** 2 conglomerate mergers ***Data 2 source***: U.S. FTC, 1980 report, to identify conglomerate mergers ***Data 2 size:*** 95 large conglomerate mergers ***Goal:*** Explores conglomerate mergers [unrelated mergers] as source of market power.	Congruence	• Market power and cost-reducing hypothesis imply that the economics of a conglomerate merger case requires weighing any welfare loss from increased market power against any welfare gain from lower costs.
Trautwein,, 1990 *Strategic Management Journal*	**n.a**	***Literature review*** ***Data Source***: Surveys of merger motive theories ***Goal:*** Overviews merger motives and relates them to merger strategies. Identifies seven groups for theories of merger motives. Looks at acquisition mode, entry mode and integration mode as prescriptions for merger strategies.	n.a	• The valuation, empire-building, and process theory of mergers have the highest degree of plausibility. The evidence is favorable, though severely limited. • The efficiency and the monopoly theories have the next degree of plausibility. • The raider and disturbance theories are rather implausible and unsupported by evidence.

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
Vermeulen, Barkema, 2001 *Academy of Management Journal*	**1966-94**	***Data Analysis*** ***Data Source***: Largest-excluding the top 4-, non-financial, non-conglomerate, subsidiaries of Dutch firms listed on the Amsterdam Stock Exchange; Standard Bedrijfs Indeling (SBI), equivalent to U.S. SIC codes, to identify new market/business, related/unrelated ***Data Size:*** 25 firms ***Goal***: Explore the way in which acquisitions affect a firm's later expansion by testing the idea that acquisitions are another way for organizations to administer shocks to their system and to counter the process of progressing simplicity. They argue that expansion through greenfields may contribute to progressing simplicity, but that acquisitions, in contrast, revitalize a firm and enhance its ability to react adequately to changing circumstances. ***Comment:*** An acquisition is described as a takeover of an existing firm; a greenfield is defined as setting up a subsidiary from scratch. Also took at look at joint ventures as an alternative form, replacing greenfields with joint ventures. The results remained consistent.	***Dependent:*** Survival [of subsequent expansions] Acquisition/Greenfield ***Independent:*** Number of preceding greenfields and acquisitions Preceding greenfields in familiar markets/new markets Preceding acquisitions in unrelated/related domains ***Control:*** Multinational diversity Product diversity Firm size Profitability Cultural distance Country's level of economic development Subsidiary expansion geography (domestic, foreign) Subsidiary expansion relatedness (related, unrelated business) Subsidiary ownership by expanding firm (jointly, wholly owned) Calendar time	• Greenfields decrease the survival rate of subsequent expansions, both greenfields and acquisitions. • A firm's acquisitions increase the survival rate of subsequent acquisitions and greenfields. • Prior greenfields in familiar product and geographic markets have a significant, negative influence on the survival of later expansions. • Prior acquisitions in related domains have a significant positive effect . • Preceding greenfields increase a firm's propensity to make acquisitions and vice versa. • Suggest, that over time, firms strike a balance between the use of greenfields and acquisitions. The use of each mode pulls a firm back to a preference for the other mode. • Prior greenfields in familiar markets have a significant, positive influence on the likelihood of acquisitions. • Acquisitions in related domains have a negative, significant effect on the likelihood of acquisitions. • Acquisitions in new countries also have a significant, negative effect on the likelihood of further acquisitions.
Melicher, Ledolter, D'Antonio, 1983 *The Review of Economics and Statistics*	**1947-77**	***Data Analysis*** ***Data Source*** : Quarterly data from the Federal Reserve Board's Index of Industrial Production and Dun and Bradsheet's record of failed firms to obtain economic activity; Standard and Poor's 425 Industrial Stock Price Index and Bond Index to obtain capital market conditions; Nelson (1959, 1966) to obtain Federal Trade Commission quarterly merger data for manufacturing and mining firms; FTC for recent years of merger data	***Dependent:*** Business failure Merger activity ***Independent:*** Stock market movement Bond Yield movement Production changes	• Mergers respond positively to previous movement in the stock market, suggesting that an increase in the stock market will be followed by an increase in merger activity. • Mergers respond negatively to prior changes in bond prices. • Suggest that a rise in the stock market would be followed by a rise in M&A activity, while the opposite would happen with the rise of bond prices.

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
		Data Size: time series, mergers during the period covered in this study ***Goal:*** Developed an explanatory model, using time-series analysis to investigate the structural relationship between aggregate merger activity and macroeconomic/ market factors, such as industrial activity, business failures, stock prices, and interest rate levels. ***Comment:*** The study's time period covers the 3rd post –World War II merger wave occurring at the time of the study.		• Changes in merger activity and changes in stock prices lead changes in production. • Mergers are leading indicators for business failure. The negative relationship implies that as merger activity increases, the number of business failures decrease one quarter later. • Business failures respond inversely to prior changes in stock prices and directly to change in bond yields. • Business failure has a negative relationship with economic activity and serves as a leading indicator for industrial production.
Golbe, While, 1993 *The Review of Economics and Statistics*	**1919-1979** **1895-1989**	***Data Analysis*** ***Data Source 1***: Time series data on U.S. mergers; used data collected by William Thorp in Nelson(1959, pp. 166-167) for years 1919-1939 - see article for details; U.S. Federal Trade Commission's *Annual Statistical Report on Mergers and Acquisitions* published in 1981 for data during 1940-1979 ***Data Size 1:*** Data series on the annual number of mergers in manufacturing and mining in first data period ***Data Source 2***: Appended two additional data series to the Thorp-FTC series. Nelson (1959) for a series on annual number and value of mergers 1895-1920; *Mergers & Acquisitions* for a series covering the number and mergers 1967-1989, and values from 1979-1989; total data include annual number of mergers 1895-1989, and value of mergers 1895-1920 and 1948-1989; GNP deflator used to correct the value series for inflation ***Data Size 2:*** Data series on the annual number of mergers in the second data period ***Goal:*** Offer a direct and formal test of a wave hypothesis as a characterization of the time series pattern of U.S. merger activity. ***Comment:*** Used regression analysis to fit a set of sine curves to the annual time series data on	n.a.	• Find that the sine curves generally provide significant explanatory power to the time series data. • The parameters characterizing the sine curves are statistically significant and reasonable in magnitude. • The timing of the peaks and troughs in merger activity implied by the fitted sine curves I reasonably close to the actual dates of the peaks and troughs in the data. • Peaks were reached in 1929 (1,245 mergers), 1968 (2,407 mergers), a trough was reached in 1939 (87 mergers). • Conclude that the data are consistent with a wave characterization. • Suggest exploring hypothesis related to the temporal patterns and causes of mergers.

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
		merger activity.		
M&A Impact on Performance				
Jensen, Ruback, 1983 *Journal of Financial Economics*	**1958-79**	***Data Analysis*** ***Data Source***: Literature review ***Goal***: Explore M&As effect on performance .	***Dependent:*** Performance (Stock-based returns) ***Independent:*** Takeover activity	• Corporate takeovers generate positive gains. • Target firm shareholders benefit. • Acquiring firm shareholders do not lose. • The gains created by corporate takeovers does not appear to come from market power.
Hitt, Hoskisson, Ireland, Harrison, 1991 *Academy of Management Journal*	**1970-86**	***Data Analysis*** ***Data Source***: Standards and Poor's COMPUTSTAT research files to find acquired companies; Moody's Industrial Manual and the Large Merger Series, by the FTC, to find the acquirers; primary, supplementary, tertiary, and over-the-counter research files distributed by COMPUTSTAT services to find R&D expenditures. ***Data size***: 191 acquisitions, representing 29 industries ***Goal***: Explore the effect of acquisition on R&D inputs and outputs.	***Dependent:*** Patent intensity R&D intensity ***Independent:*** Acquisitions ***Control:*** diversification, leverage, size, liquidity, profitability/performance/ROA, avg. industry R&D intensity	• Strong support for the negative effects of acquisitions on R&D investments. • Strong support for the negative effects of diversifying acquisitions on R&D outputs, or patents.

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
Pennings, Barkema, 1994 *Academy of Management Journal*	1966-88	***Data Analysis*** Longitudinal and lateral learning ***Data Source***: Amsterdam Stock Exchange to identify top 20-based on sales- non-financial firms in the Netherlands ***Data size***: 14 firms, 462 expansion projects ***Goal***: Examine individual expansion projects and analyze their success rate based on the characteristics of the independent variables.	***Dependent:*** Success of expansion (return on capital) ***Independent:*** Diversification type Horizontal, Related, Unrelated, Vertical Mode new venture, acquisition Location Domestic Foreign Ownership Full, 50.1 – 100%, 50%, 50% Expansion experience ***Control:*** Year	• The longevity of vertical expansions is considerably better than that of any of the other diversification types. • The unrelated expansions are the shortest-lived. • Related and horizontal expansions had a shorter longevity than vertical, but longer longevity than unrelated expansions, and turned out to have quite similar life spans. • Acquisitions longevity marginally outperformed start-ups. • There is a very similar trend between domestic and foreign expansions, and differences are not statistically significant. • Expansions in which the acquiring firm has exactly 50% ownership had the worst survival. • Full or majority ownership had the best longevity. • Minority ownership endured longer than 50% but under performed full or majority ownership.
Larsson, Finkelstein 1999 *Organization Science*	n.a.	***Case Survey*** ***Sample Source***: research journals, books, dissertations, conference proceedings and papers, teaching cases, business publications, and unpublished papers ***Sample size***: 61 M&As ***Goal***: Test a process-oriented integrative model that integrates theoretical perspectives from economics, finance, strategy, organizational theory, and human resource management. ***Comment:*** Used case survey method because it combines the richness of in-depth case studies with the breadth and generalisability of large-sample empirical investigations. Provides list of the case sample. Measure success by measuring synergy realization, instead of accounting of stock-based measures.	***Dependent:*** Synergy realization ***Independent:*** Combination potential Organizational integration Employee resistance Management style Cross-nationality Relative company size ***Control:*** Case data collection Case perspective Case publication Case calendar year Case period length	• Synergy realization is positively associated with .combination potential and organizational integration • Combination potential and organizational integration are positively associated. • There are no correlations between employee resistance and synergy realization. • Management style similarity is negatively correlated with employee resistance. • Relative size is positively associated with combination potential and organizational integration. • There is some support for cross-border M&As being positively associated with combination potential. • The case data collection is positively correlated with all four constructs in the integrative M&A model developed in the study.

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
Seth, 1990 *Strategic Management Journal*	**1962-79**	***Data Analysis*** ***Data 1 Source***: Bradley et al. (1988) for tender offers; U.S. FTC Statistical Report on *Mergers and Acquisitions* (1981) for all completed offers of firms with assets >=10 million; *Wall Street Journal* for announcement dates; CRSP database for security returns and prices, and common shares outstanding, firm's 10-K fillings and annual reports to cross-check shares outstanding; Conrad and Kaul (1988) for risk-free return data ***Data 1 size:*** 63 combined entities ***Data 2 Source***: COMPUSTAT database ***Data 2 size:*** 102 tender offers for control ***Goal***: Examines how value is created in related and unrelated types of acquisitions, using a two tier approach to examine those sources of value creation. ***Comment:*** A tender offer is an offer to purchase some or all of shareholders' shares in a corporation. The price offered is usually at a premium to the market price.	***Dependent:*** Value creation in M&As/synergistic gains ***Independent 1:*** Type of acquisition: related / unrelated ***Independent 2:*** Type of acquisition: related / unrelated Product relatedness (cost= change in production cost) Marketing relatedness Operating relatedness (size=relative market value of target to bidder) Debt (changes in long term debt) Total Debt (changes in total debt)	• Both related and unrelated acquisitions create value, primarily on the basis of changes in expected cash flows. • There is no evidence that market imperfections are so severe as to result in significant value creation in acquisitions through financial diversification. However, this finding must be viewed cautiously in light of the confounding effect of debt financing. • For both related and unrelated acquisitions considered together, value increases are associated with changes in operating decisions (operating relatedness) and changes in financing decisions (captured by the debt variables). • Value creation is positively associated with greater marketing relatedness between the bidder and the target, and with declines in operating costs. **For related acquisitions** • Changes in operating decisions (operation relatedness) are significantly associated with value creation. • Marketing relatedness, product relatedness nor debt are significantly associated with value creation. **For unrelated acquisitions** • An increase in debt is positively associated with value creation.
Megginson, Morgan, Nail, 2002 *Journal of Banking & Finance*	**1977-96**	***Data Analysis*** ***Data 1 Source***: Herfindahl index to distinguish between levels of corp. diversification in classifying mergers ***Data 1 size:*** 203 strategic mergers ***Goal***: To examine the long-term wealth effects of the independent variables to see if one or more has a dominant effect on long-term merger performance. Also use the continuous measure of change in focus to see if the magnitude of focus changes significantly impacts post-merger performance measures. Corporate focus is achieved through the divestiture of non-core	***Dependent:*** Long-term performance ***Independent:*** Corporate focus Corporate diversification ***Control:*** Firms' lines of business Merger type Method of payment Managerial resistance Value effects (Book To Market-BTM-ratio of the acquirer)	• There is a significant positive relationship between corporate focus changes and long-term merger performance in strategic merges. • Mergers that decrease focus result in significant loses in relative shareholder wealth, operating performance, and firm value over the three years following merger completion. • Mergers that either preserve or increase focus result in marginal improvements in long-term performance • Cash financing has a significant positive impact on long-term operating performance, but this positive impact does not translate into stockholders returns

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
		assets. ***Comment:*** Use strategic mergers to avoid the biases inherent in a comparison of mergers or acquisitions with different objectives. Employed a benchmarking methodology designed to remove biases in measuring the merger-related changes in corporate focus and long-term merger performance.	Merger time period	*or firm value changes.* • Did not find that firms with low BTM ratio outperform those with high BTM ratio. • Did not find superior performance for hostile takeover • Corporate focus is the primary determinant of long-term merger performance, followed by t he form of payment. • The extend of the corporate focus change is a more important measure of corporate focus or diversification than the sign of the change.
Shelton, 1988 *Strategic Management Journal*	**1962-83 Late 1970s Earl 1980s**	***Data Analysis*** ***Data 1 Source***: Rumelt (1974, 1978) for random selection of bidding firms. Rumelt selected 100 *Fortune* 500 industrial companies in the sample period. ; *Fortune* 500 industrial companies in late 1970s and early 1980s for additional random sample ***Data 1 size:*** The bidding firms made 218 acquisitions during the sample period ***Goal***: *Presents a new method of classifying* acquisitions and focus on how the assets of the target fit with the assets of the bidder, and how the assets of the target change the product market opportunities of the bidder. In short, explores the performance effects on different types of combinations.	***Dependent:*** Normalized dollar value created by the merger = dollar gain created in an acquisition per dollar of equity involved in the transaction ***Independent:*** Percentage Related-supplementary Percentage related-complementary Percentage identical Target sales/bidder sales Rival bidders ***Control:*** Rival bidders Changes in merger regulation (Post-William Act)	• Business fits in which the assets of either the target or the bidder are used more intensely create value: identical, related-complementary, and related-supplementary. • Acquisitions that permit expansions into new markets (related-complementary) or within the same business (identical) create the most value. • Suggests that bidder management should seek the largest target firms with the high-quality assets that will enable them to expand into related markets or to grow their existing businesses. • Suggests that bidder management should not be afraid to pursue highly sought-after targets since these companies are often desirable merger candidates.
Chatterjee, Lubatkin 1990 *Strategic Management Journal*	**1962-79**	***Data Analysis*** ***Data Source 1***: FTC large merger series (>=10 million); *Wall Street Journal* for announcement dates; CRSP Monthly Price and Return File; CRSP Daily Returns File; COMPUSTAT data files for bidder's list ***Data 1 Size:*** 85 "monthly merger" ***Data 2 Size***: 120, "daily merger" including Data 1 ***Data 3a Size***: 116 "daily leverage merger" from	***Dependent:*** Systematic/stockholder risk ***Independent:*** M&A type: related, unrelated Monthly mergers Daily mergers Leverage ***Control:*** Systematic risk of target	• Related mergers will lower the systematic risk of *the bidding firm.* • Evidence suggests that both merger strategies, related and unrelated, are effective at mitigating general environmental/stockholder risk. • Suggest that the set of possible merger targets may need to be limited solely by the criterion of operational relatedness.

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
		the 120 "daily merger" ***Data 3b Size***: 65 "daily mergers" ***Goal***: To explore if the magnitude and direction of the systematic risk of bidding firms is determined by the degree to which the merging business are related. ***Comments***: Estimated shifts in risk over daily as well as monthly time horizons. Uses stock based returns.		
Chatterjee, Lubatkin, Schweiger, Weber, 1992 *Strategic Management Journal*	**1985-87**	***Survey*** ***Sample Source 1***: *Journal of Mergers and Acquisitions* during sample period; Standard Industrial Classification (SIC) codes to assess company relatedness; Directory of Corporate Affiliations and Moody's Manuals for top management information; *Wall Street Journal* for announcement dates; Center for Research in Security Prices (CRSP) for acquiring firm listing ***Sample 1 Size:*** 185 acquired firms, 39% response rate, after eliminations the final sample contained 25 firms ***Goal***: To explore whether shareholder gains are associated with the relatedness of merging firms and the perceptions of differences in culture between the two firm's top management, of firms with similar strategic fit. ***Comments***: Used stock-based measures because 1) stock prices are believed to be fully specified; that is they are not limited to a specific aspect of performance, 2) stock prices have been shown to see through managers attempt to manipulate reported accounting measures, 3) stock prices are reported objectively.	***Dependent:*** Shareholder value (financial performance) ***Independent:*** Cultural differences Target's firm tolerance for multiculturalism Relative organization size	**The change in shareholder value of buying firms involved in related mergers**: • is inversely related to the degree of perceived cultural differences between the combining top management teams. • is directly related to the degree to which the buyer's top management team tolerates multiculturalism. • Capital market's perceptions about the earnings impact of a related merger are associated with the target managers' perception of cultural differences between their top management team and that of the acquiring firm. • Findings show that investors are skeptical about mergers where the cultures between the top management teams are perceived to be incompatible, while they are supportive of mergers where the cultures appear to be compatible. • Suggest that the management of a buying firm should pay at least as much attention to issues of cultural fit during the pre-merger search process as they do to issues of strategic fit. • Regarding multiculturalism, an overemphasis on controlling newly acquired firms by imposing goals and decisions on them may be dysfunctional. • Finding suggests that integration needs to proceed carefully in order to reap any anticipated synergies.
Ramaswamy, 1997	**1984-90**	***Data Analysis***	***Dependent:***	• Mergers between target and bidder firms

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
Academy of Management Journal		***Data Source 1***: Federal Deposit Insurance Corporation (FDIC) to ID bank membership of banks involved in intrastate mergers consummated in 1987; annual compilations of the *Bank Quarterly* and statewide annual reports of banks published by Sheshunoff Information Services for objective, secondary data relating to both target and bidder banks in the data period; Call and Income Reports file by each FDIC member bank and the *Data Book-U.S. States, Counties, Other Areas*, and FDIC publication to supplement the data ***Data 1 Size:*** 46 mergers (comprising 92 banks, bidders and targets) ***Goal***: Examines the impact of strategic similarities between target and bidder firms on changes in post-merger performance. ***Comments***: Focused on horizontal mergers to address why some related mergers fail while others succeed. Used accounting measures to assess performance.	Post-merger performance ***Independent:*** Strategic characteristics Market coverage Operational efficiency Emphasis on marketing activity Client mix Risk propensity ***Control:*** Pre-merger Return On Asset (ROA) Relative size (bidder to target)	emphasizing similar strategic characteristics result in better performance than mergers between targets and bidders emphasizing dissimilar strategic characteristics. • Strategic dissimilarities between bidder and target firms had a negative influence on performance following a merger. • These findings make a persuasive case for using strategy indicators to characterize bidder-target relatedness in studies of pos-merger performance. • Suggests that using SIC codes or FTC categories, vs. strategic characteristics, can result in not encompassing crucial areas of operations in which matching managerial skills and competencies could add value. • Suggests strong support for the dominant school of thought that emphasizes similarities in strategic characteristics as a precondition for superior post-merger performance.
Healy, Palepu, Ruback, 1997 *MIT Sloan Management Review*	**1979-mid 1984**	***Data Analysis*** ***Data Source 1***: Center for Research in Securities Prices database to identify 382 firms that were removed in data period due to takeovers; *Wall Street Journal* to identify the acquiring company's name; NYSE and American Stock Exchange to check that firm was a U.S. company; *Compustat* to compute target firm size ***Data 1 Size:*** 50 largest takeovers in data period meeting criteria ***Goal***: Examine acquiring companies' cash flow performance after a merger ***Comments***: Used accounting performance measures (e.g., revenues). Suggest that post-takeover accounting performance measures represent actual economic benefits generated by takeovers, whereas takeover announcement returns represent investor's expectations of takeover benefits. Suggest that future research	***Dependent:*** Acquirer's cash flows ***Independent:*** Attitude (friendly, unfriendly) Degree of business overlap (low, medium, high) Financing Takeover type (strategic, financial)	• Strategic takeovers generated substantial gains for acquirers. Financial transactions broke even at best. • Find a significant relation between the profitability of takeover transactions and three transaction characteristics that are under management control. o Friendly takeovers outperformed hostile takeovers. o Acquisitions with stock payment outperformed cash transactions. o Transaction with a high overlap between acquirer and target companies performed better than those of unrelated businesses. • The superior performance outlined above is attributed to both higher takeover synergies and lower premiums paid to the stockholders of target companies, suggesting that transaction characteristics under management control

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
		explore how strategic acquirers both negotiate lower takeover premiums and integrate target firms more effectively to realize larger synergies.		substantially influenced the ultimate payoffs from the takeovers. • Suggested that acquirers realize positive performance outcomes.
Chatterjee, 1991 *Academy of Management Journal*	**July 1962-79**	***Data Analysis*** ***Data Source 1***: Large merger series of the Federal Trade Commission to identify 116 mergers in data period; Center for Research in Security Prices (CRSP) daily tapes; SIC 4 digit codes used to identify the industry, and thus assess that merger was vertical; CRSP tapes to identify 1,459 rival firms in similar SIC codes to the acquiring firms at the time of the merger announcements; *Census of Manufacturers* published in the year closed to the announcements and four-digit SIC codes to obtain seller concentration ratios to asses market power and obtain the acquiring industry's sales ***Data 1 Size:*** 38 target firms, 68 bidder firms ***Goal***: Investigates the factors that can explain the gains resulting from vertical mergers. ***Comments***: Used cumulative abnormal returns to measure performance.	***Dependent:*** Acquirer's standardized cumulative abnormal returns Target's standardized cumulative abnormal returns Rival's standardized cumulative abnormal returns ***Independent:*** Relative market power Acquiring firm's industry seller concentration Target firm's industry seller concentration Growth	• After a merger the revaluation of the acquiring firm is high if its production stage has high market power and the target firm is in a relatively competitive industry. • Rate of growth does not seem to influence the revaluation of acquiring firms in the context of vertical mergers. • Suggests that gains can be made from vertical mergers when acquiring firms select targets from relatively competitive industries.

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
Light, 1999 *Harvard Business Review*	n.a.	***Literature Review*** ***Goal***: To introduce a study completed by two business school professors, Harbir Singh and Maurizio Zollo , regarding acquisitions in the US banking industry. The study looked to determine why few acquisitions make money for the buyer and what situations make an acquisition more likely to create value. The researchers compared return on assets (ROA) one year before a deal and three years later, using regression analysis to see how changes in ROA correlated with pre-acquisition conditions, acquiring company experience with the acquisition process and the post-acquisition process. ***Comment***: Tacit knowledge is the know-how a company gains by doing a task frequently. It's the knowledge that resides in the heads of employees. Codified knowledge is the kind that resides in documents and models. It can include manuals on systems conversion and training as well as computer programs for financial evaluation and project management.	***Dependent:*** Acquisition success ***Independent:*** Target company's assets Acquiring company's experience Post-acquisition process	• The acquired company's assets are not a crucial determinant of the performance of the merged company. • Suggests that any new value has to be created through the decisions managers make after the deal is done. • High levels of integration are strongly related to better performance. In other words, banks that move quickly to combine functions, products, systems, and branches gain higher payoffs from acquisitions than banks that take a more hands-off approach. • Suggests that once companies understand that post-acquisition decisions are the drivers of success, they might reasonably ask whether they can use the knowledge they've gained from previous acquisitions to standardize the acquisition process. • Regarding learning from experience, find that for banks in the study, tacit knowledge did have a positive impact on the value created if that knowledge was accumulated through "in-market" acquisitions - those in which the combining banks served the same geographic market and targeted the same customer groups with similar products. • Tacit knowledge did not improve performance in cases where the acquiring bank was seeking to extend its geographic or market reach by buying a less familiar target. • Codified knowledge was especially useful in acquisitions involving a high degree of integration . • Conversely, when two companies are not trying to tightly integrate themselves, a heavy emphasis on codification can hurt the acquisition's chances of creating value.

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
Gupta, Gerchak, 2002 *Management Science*		***Model introduction*** ***Goal***: To develop simple models that a senior manager of a firm contemplating a bid can use to quantify the effect of production and demand characteristics. The focus is on valuation issues rather than organizational, regulatory or technical (such as compatibility of information systems) issues. Focus on valuation is for the purpose of helping would-be bidders gain a better understanding of key drivers of operational synergies. This is turn will help them determine how much premium (over prevailing market price prior to the tender announcement) can be justified on the basis of improved production efficiency.	Target firm's valuation Production capacity Manufacturing flexibility Demand correlation and volatility	• The production characteristics of the both the bidder and the target matter significantly, although widely used methods for valuing target firms in M&A do not account for these characteristics. • Show that these characteristics have a significant, and often non-monotone, impact on the target's value and on the value of operational synergy. • Show that the size of the bidder's capacity, demand volume, and volatility affect its valuation of the target in a significant and non-monotonic way. Changing any of these three characteristics can cause either an increase or a decrease in the target's value, depending on the values of other parameters.

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
Fowler, Schmidt, 1989 *Strategic Management Journal*	**1975-79**	***Data Analysis*** ***Data Source 1***: 60 firms in the industrial manufacturing category, using SIC codes 2000-3999), that engaged in tender offers in data period; COMPUSTAT industrial tapes for financial statements; 110 COMPUSTAT companies to compute the time-specific, industry-specific index values using SIC industry codes for performance calculations; *Austin Tender Offer* statistics database for determine if tender offer was hostile or uncontested; *Mergers and Acquisitions Cross-Roster Index* and *Moody's Industrial Manuals* to assess number of previous acquisitions; *Moody's Industrial Manuals* to acquire acquiring company's age; SIC codes to measure industry commonality ***Data 1 Size:*** 42 industrial manufacturing firms engaged in tender offer form of acquisitions ***Goal***: Examine the relationships between commonly discussed strategic acquisition factors and long-term financial performance measures of acquiring firms . ***Comments***: The financial performance measures include both accounting and capital market data. Analyzed performance over an extended period of time. The type of firm restriction was used based on the recommendation that mergers are not 'homogeneous' phenomenon .	***Dependent:*** Financial performance (return on common equity, total return to shareholders) ***Independent:*** Relative size Contested vs. uncontested Acquisition experience Organizational age Percentage acquired Industry commonality	• The relative size measure exhibited a negatively correlation with both performance measures. • Post-acquisition performance decreased significantly for acquiring firms when target firms contested the acquisition. • On average, post-acquisition financial performance improved significantly for organizations that had previous acquisition experience, acquired a higher percentage of target, or were older. • Did not observe a significant relationship between industry commonality and either performance measures. • Suggest that older firms may be more adept at integration efforts. • Tender offers that were contested by target firm's managers resulted in significantly lower levels of change in abnormal return on common equity and change in abnormal return to shareholders than uncontested tender offers. • Percentage acquired explained a significant portion of the change in abnormal return on common equity. Presumably, as the percentage acquired increases, more control is exerted over a target and integration effectiveness is enhanced. • Suggest that performance measures should control for market, industry and economic effects. Using abnormal returns, rather than raw returns, helps to accomplish this. • Suggest that post-acquisition performance analysis should be contrasted with performance in the period preceding acquisition activity so that inferences can be drawn concerning the effectiveness of the acquisition strategy.

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
Haleblian, Finkelstein, 1999 *Administrative Science Quarterly*	**Jan. 1980 – Dec. 1992**	***Data Analysis*** ***Data Source 1***: FTC Large Merger Series (1948-1979), which consists primarily of publicly traded manufacturing firms making large, completed majority acquisitions, to assess prior acquisition experience by measuring the number of acquisitions an acquirer made; Securities Data Corporation (SDC) database from 1980-1983 and the Lexis/Nexus database from 1984-1992 to acquire data on acquisition experience, announcement dates, and several of the control variables; COMPUSTAT values and Lexis/Nexus to ensure validity of the data , such as asset values; *Wall Street Journal* to verify the classification of attitude of the acquisition and announcement dates; COMPUSTAT for financial data; the Center for Research in Securities Pricing (CRSP) for market returns ; *Dun and Bradsheet's Reference Book of Corporate Management* to collect CEO tenure data used in supplementary analysis ***Data 1 Size:*** 449 acquisitions ***Goal***: Using behavioral learning theory, examine the influence of prior organizational acquisition experience on the performance of acquisitions. ***Comments***: Used abnormal stock price returns, which are the same as financial measures, commonly used by the finance and strategic management literature, as well as accounting based measures in a supplementary analysis. Results remained consistent.	***Dependent:*** Acquisition performance ***Independent:*** Organization acquisition experience Target-to-Target similarity CEO acquisition experience (used in supplementary analysis) ***Control:*** Acquirer-to-target relatedness Relative acquisition size Stock consideration Acquirer slack Attitude (friendly/unfriendly) Acquiring firm performance Period effects	• Data shows an overall U shaped relationship between organization acquisition experience and acquisition performance. • The more similar a firm's acquisition targets are to its prior targets, the better they perform. • Suggest that relatively inexperienced acquirers, after making their first acquisition, inappropriately generalize acquisition experience to subsequent dissimilar acquisitions, while more experienced acquirers appropriately discriminate between their acquisitions. • Both relatedness and relative acquisitions size were positively and significantly related to acquisition performance, though size was only marginally significant in one of the models. • The free cash flow measure of slack was found to be – related to acquisition performance in two of the three models, while debt-to-equity, a measure inversely related to slack, was found to be positively related to acquisition performance. • Suggest that behavioral theory may enhance understanding of organization experience effects. • CEO acquisition experience is negatively related to acquisition performance. • Due to the shorter time lines inherent in CEO-based measures, which include experience and number acquisitions during tenure, relative to an organization based measure, meant that few CEOs would have had time to amass sufficient experience to pass the inflection point of the U-shaped relationship.
M&A Integration				
Pablo, 1994 *Academy of Management Journal*	**1990-93**	***Survey*** Questionnaire (policy capturing technique) ***Sample Source***: ADP Network Services Corporation's Mergers and Acquisitions database to identify the acquiring firms. Identified the CEO or president	***Dependent:*** Decision on the level of integration Decision criteria in combination **Independent:**	**In making integration design decisions manager's decision models reflect:** • A positive relationship between strategic task needs and the level of integration chosen • A negative relationship between organizational task needs and the level of integration chosen.

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
		Sample Size: 58 firms, 21.4% response rate, 20% useful ***Goal:*** Examine manager's decisions in order to more fully understand how acquisitions' task, cultural, and political characteristics enter into the decision models that guide manager's judgments about integration design.	Strategic task needs Organizational task needs Multiculturalism of acquirer firm Compatibility of Acquisition visions Power differential Acquisition experience Organizational size Industry category Management level Functional background	• A negative relationship between multiculturalism of the target and the level of integration chosen. • A negative relationship between compatibility of acquisition visions and the level of integration chosen. • A negative relationship between power differential and the level of integration chosen. • In making integration design decisions, managers from service industry organizations will weight multiculturalism more heavily than will managers from manufacturing industry organizations.
Ranft, Lord, 2002 *Organization Science*	**6/00-7/02**	***Case Study Research*** Interviews ***Sample Source***: Security Data Corp (SDC) Worldwide Mergers and Acquisitions database to identify "high tech" acquisitions; consulted archival data sources, press releases, and firms' web pages ***Sample size***: 7 cases, domestic firms in high-tech industries, where acquisition occurred in the last 36 months, and acquisition < $250 million ***Goal***: Investigate the dynamics of acquisition implementation in firms that attempt to gain new technologies and capabilities by acquiring other firms. ***Comment:*** Limiting the time elapsed since the acquisition facilitated interacting with key executives involved in pre-acquisition decisions and post-acquisition implementation processes Selected smaller acquisitions to increase the likelihood of being able to identify and discuss issues related to the transfer of technologies and capabilities.	Five major components of a grounded model of acquisition: 1) the nature of underlying knowledge 2) multiple dimensions of the acquisition implementation process 3) the acquisition context 4) management practices 5) the transfer of technologies and capabilities to the acquiring firm	The following propositions are posed: **1) Nature of underlying knowledge** • The greater the a) tacitness and b) social complexity of knowledge underlying an acquired firm's technologies and capabilities, the more difficult it is to transfer during acquisition implementation **2) Dimensions of acquisition implementation** **During acquisition implementation:** • Greater autonomy inhibits the transfer of the target's technologies and capabilities that are based on tacit/or socially complex knowledge. • Rich communications facilitate the transfer/preservation of the target's technologies and capabilities by enhancing the exchange of tacit and/or socially complex knowledge (SCK). • Retention of key acquired employees facilitates the preservation of the acquired firm's technologies and capabilities that are based on tacit and/or SCK. **Slow acquisition implementation is positively associated with:** • The degree to which acquired technologies and capabilities are based on tacit and/or SCK. • Post-acquisition autonomy of the acquired firm. • A) The preservation of tacit and/or SCK, but is B) curvilinearly (inverted U shape) associated with the transfer of these technologies and capabilities

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
				to the acquirer. **3) Acquisition context** • The relative size and the relative performance of the target firm are positively associated with a) autonomy and b) retention of key employees but are negatively associated with c) communications between the two firms. **4) Management practices** • The proportion of managers from the acquirer appointed to key post-acquisition management roles a) reduces post-acquisition autonomy of the acquired firm, b) reduces retention of acquired employees, and c) is curvilinearly (inverted U shape) related to communications between acquirer and target firm. • During acquisition implementation, a) greater tacitness and/or SCK underlying an acquired firm's technologies and capabilities is positively associated with the use of financial incentives aimed at retention, and b) use of such financial incentives enhances retention of key target employees. • During acquisition implementation, evidence of the acquirer's commitment to the acquisition are positively associated with a) communications and b) retention of employees.
M&A Information Systems				
Pal, Palmer 2000 *Decision Support Systems*	n.a	***Literature Review*** ***Goal:*** Introduce an implemented prototype of a hybrid Decision-Support System for Business Acquisition Process (DSBAP) that uses rule-based and case-based reasoning methods. ***Comment:*** This type of system could be used in making acquisition decision.	n.a.	• In 1990s, knowledge-based systems development methods have been playing an important role in a new generation of DSS. The ability of these systems in processing knowledge has let to cost savings, faster decision process, good payoff, and significant competitive advantage. • The production of partial rule-based advice and the argument generation facilities reflect the intelligent ability of the implemented system to use the rule and case knowledge in ways that correspond to how humans use it.

Table A.1 Summary of Major Themes in the Merger Literature (Continued)

Study	Period	Method/Comments	Measures	Results/Suggestions
				• Suggest that the company valuation methods require further work.

APPENDIX B

THE SURVEY INSTRUMENT

The survey instrument used in this dissertation research.

NJIT New Jersey's Science & Technology University

DEPARTMENT OF INFORMATION SYSTEMS

New Jersey Institute of Technology
College of Computing Sciences
University Heights
Newark, NJ 07102
973.596.3368 Fax 973.592.2986
Gab0650@njit.edu Att: Ginny Baro
http://is.njit.edu/

TECHNOLOGY DEPARTMENT POST-MERGER & ACQUISITION TECHNOLOGY INTEGRATION SURVEY (ID#)

Without the help and participation of experienced technology executives like you, this important Ph.D. dissertation research at the New Jersey Institute of Technology cannot be completed.

This survey is designed to take approximately 5 - 10 minutes (24 key questions). All responses will remain anonymous, and all information provided will be kept confidential. None of the questions ask for proprietary information about your firm. No private group has any proprietary interest in the project.

You will receive an executive, interpretive summary of the findings, which will describe to you **manageable factors that influence post-merger technology integration performance**, allowing your team to manage them more closely; no specific merger firms will be identified in the summary report.

Ginny Baro, principal investigator, will make a **$5 donation to the American Cancer Society** for each completed survey and consent form returned. An aggregate donation receipt will be included with the Executive Summary.

In addition, all returned questionnaires will be entered into a raffle to win an *iPod nano* and a $100 iTunes gift card, for a total value of $250.

Kindly place the **completed survey** and **consent form** in the enclosed, addressed, postage-paid envelope by **February 8th, 2008.**

If you cannot complete this questionnaire and consent form, please consider asking a colleague or staff member with technology post-merger integration experience to complete them.

Thank you!

If you have any questions, please contact Ginny Baro at 201-388-6318 or gab0650@njit.edu.

To fill out this survey, please select a completed M&A where you were privy to details associated with the information systems integration, and provide us with your assessment immediately after the IS integration was completed, not your assessment today.

Terms used in the survey:

Acquirer: The M&A partner who initiates the M&A.

Target: The M&A company which is targeted and which accepts the M&A.

Completed M&A: A merger or acquisition where the IS integration has been implemented.

M&A Success: The overall ability to attain the goals and objectives set forth by the M&A plan and the ability to effectively implement such plan to combine the merging firms.

IS integration Success: The ability to effectively integrate information systems (IS) components as a result of the M&A, where IS components refer to the infrastructure, processes, applications, people (skills), and culture that make up the information systems environment of the merging firms.

IS integration Activities: All the activities that the technology team engaged in relevant to the IS integration, e.g., planning, evaluation and assessment, system integration, re-training, etc.

Degree of IS integration: The extent to which the IS components between the merging firms were "actually" combined as a result of the M&A, where IS components refer to the infrastructure, processes, applications, people (skills), and culture that make up the information systems environment of the merging firms.

M&A Profile:

Your company name in the **completed M&A**: _____ Line of Business: _____

Other company name in the **completed M&A**: _____ Line of Business: _____

Year when M&A was completed: (*check only one*) 2002 2003 2004 2005 2006 Other _____

What was your company's role in the M&A? (*check only one*) Acquirer Target

Was your company involved in any other M&As around the same time as the M&A above? Yes No

Note: If there are other M&As for which you would also like to complete this survey, please contact Ginny Baro.

Survey Introduction:

This questionnaire has three main sections. Section one inquires about the M&A's technology integration. Section two ascertains the state of the organizational an information systems factors associated with the technology integration. Section three asks questions relevant to your M&A background. In the remainder of this questionnaire, ***italics will be used to provide instructions*** and **regular type will be used for the survey questions.**

PART I. INFORMATION SYSTEMS (IS) INTEGRATION ASSESSMENT

For the completed M&A between the companies you listed in the previous page, using the given scale, please ***circle*** *a number that best describes your answer. If you cannot recall or are unaware of the answer, please circle "Don't know."*

1. How would you assess the impact of the IS integration on the ability of the IS function to...?

a.	Enhance the organization's competitive position (by market share increase, profit increase, etc., attributable to the IS function)	**Very negative**	1	2	3	4	5	6	7	**Very positive**	Don't know
b.	Shape or enable critical business strategies	**Very negative**	1	2	3	4	5	6	7	**Very positive**	Don't know
c.	Integrate IS planning with organizational planning	**Very negative**	1	2	3	4	5	6	7	**Very positive**	Don't know
d.	Provide integration of related technologies across organizational units	**Very negative**	1	2	3	4	5	6	7	**Very positive**	Don't know
e.	Provide corporate-wide information accessibility	**Very negative**	1	2	3	4	5	6	7	**Very positive**	Don't know
f.	Provide good quality information (accurate, useful, timely, etc.)	**Very negative**	1	2	3	4	5	6	7	**Very positive**	Don't know
g.	Contribute to overall organizational financial performance (as measured by return on investment, return on assets, etc.)	**Very negative**	1	2	3	4	5	6	7	**Very positive**	Don't know
h.	Manage its own financial performance (meeting budgets, controlling systems maintenance cost, etc.)	**Very negative**	1	2	3	4	5	6	7	**Very positive**	Don't know
i.	Operate systems efficiently by ensuring systems availability, reliability and responsiveness	**Very negative**	1	2	3	4	5	6	7	**Very positive**	Don't know

Please check that you have answered every question on this page

j.	Develop systems efficiently and effectively (on time, within budget, satisfying requirements, etc.)	**Very negative**	1	2	3	4	5	6	7	**Very positive**	Don't know
k.	Recruit and maintain a technically and managerially competent staff	**Very negative**	1	2	3	4	5	6	7	**Very positive**	Don't know
l.	Identify and assimilate new technologies	**Very negative**	1	2	3	4	5	6	7	**Very positive**	Don't know

2. What is your assessment of the contribution of the IS integration activities to the following aspects of the overall M&A plan...?

a.	M&A schedule	**Very negative**	1	2	3	4	5	6	7	**Very positive**
b.	M&A budget	**Very negative**	1	2	3	4	5	6	7	**Very positive**

3. How would you assess the efficiency of IS resource utilization during the integration process?

a.	Time resources	**Very low**	1	2	3	4	5	6	7	**Very high**
b.	Personnel resources	**Very low**	1	2	3	4	5	6	7	**Very high**
c.	Financial resources	**Very low**	1	2	3	4	5	6	7	**Very high**

4. What is your assessment of the capabilities of the IS function with regard to...?

a.	Exploiting opportunities from the merger or acquisition	**Very low**	1	2	3	4	5	6	7	**Very high**
b.	Avoiding problems typically arising from the merger or acquisition	**Very low**	1	2	3	4	5	6	7	**Very high**

5.	**How successful has this IS integration been?**	**Very unsuccessful**	1	2	3	4	5	6	7	**Very successful**
6.	**For the combined organization, what is your assessment of the M&A (in terms of benefit to the organization)?**	**Very unsuccessful**	1	2	3	4	5	6	7	**Very successful**
7.	**What is your post-M&A assessment of the degree of IS integration that was required after the M&A?**	**Non-Existent**	1	2	3	4	5	6	7	**Extensive**

Please check that you have answered every question on this page

8.	**What is your assessment of the role that the target company's IS function played in the acquirer's decision to merge?**	**Not considered**	1	2	3	4	5	6	7	**Motivating factor**
9.	**How would you assess the relative importance of the IS integration to the overall success of the M&A?**	**Very low**	1	2	3	4	5	6	7	**Very high**

PART II. ORGANIZATIONAL AND INFORMATION SYSTEMS ATTRIBUTES

For the completed M&A between the companies you listed on Pg. 2, using the given scale, please ***circle*** *a number that best describes your answer.*

10.	**How would you characterize executive management (non-IS) support of IS integration activities resulting from the M&A?**	**Very negative**	1	2	3	4	5	6	7	**Very positive**

11. How would you assess the quality of communication between the IS and end-user areas regarding the progress of the M&A activities?

a.	Communication of IS integration activities to end-user areas	**Very low**	1	2	3	4	5	6	7	**Very high**
b.	Communication of end-user areas M&A activities to IS	**Very low**	1	2	3	4	5	6	7	**Very high**

12. How would you characterize the degree of IS participation in the following planning processes?

a.	Overall business planning	**Very low**	1	2	3	4	5	6	7	**Very high**
b.	M&A planning	**Very low**	1	2	3	4	5	6	7	**Very high**

13. What is your assessment of the quality of these planning processes?

a.	Overall business planning	**Very low**	1	2	3	4	5	6	7	**Very high**
b.	M&A planning	**Very low**	1	2	3	4	5	6	7	**Very high**
c.	IS integration planning	**Very low**	1	2	3	4	5	6	7	**Very high**

14.	**How would you characterize end-user involvement in IS integration activities resulting from the M&A?**	**Very low**	1	2	3	4	5	6	7	**Very high**

Please check that you have answered every question on this page

15. How would you characterize the quality of technical support available to end-users during the IS integration?	Very low	1	2	3	4	5	6	7	Very high
16. How was the quality of technical support available to end-users during the IS integration compared to how it was before the M&A?	Much Worse	1	2	3	4	5	6	7	Much better
17. How would you characterize the provisions made for addressing IS employee morale after the M&A?	Very low	1	2	3	4	5	6	7	Very high

18. How would you characterize the provisions made for re-training due to the IS integration?

a. IS personnel	Very low	1	2	3	4	5	6	7	Very high
b. End-users	Very low	1	2	3	4	5	6	7	Very high

19. In your opinion, what were the top three issues/factors that had a <u>positive</u> impact on the overall IS integration? (*please print*)

a. _____	Not significant	1	2	3	4	5	6	7	Very significant
b. _____	Not significant	1	2	3	4	5	6	7	Very significant
c. _____	Not significant	1	2	3	4	5	6	7	Very significant

20. In your opinion, what were the top three issues/factors that had a <u>negative</u> impact on the overall IS integration? (*please print*)

a. _____	Not significant	1	2	3	4	5	6	7	Very significant
b. _____	Not significant	1	2	3	4	5	6	7	Very significant
c. _____	Not significant	1	2	3	4	5	6	7	Very significant

PART III. PARTICIPANT DEMOGRAPHICS

Please PRINT the answer to the following questions regarding your background.

21. **What was your title during the IS integration?** _____

22. **How many years of experience do you have in IS Management?** _____

23. **How many years of experience do you have with IS integrations?** _____

24. **How many M&As have you experienced in your career?** _____

Thank you for taking the time to complete this questionnaire!
Your assistance in providing this information is essential to the success of this dissertation research.

Please check that you have answered every question on this page

If you have any comments about this survey, please PRINT them in the space provided below.

Kindly place the **completed survey** and **consent form** in the enclosed, addressed, postage-paid envelope and mail to:

Ginny A. Baro, Ph.D. Candidate
New Jersey Institute of Technology
College of Science and Liberal Arts
323 M.L.King Blvd.
University Heights
Newark, NJ 07102-1982

If you are not the person to whom this questionnaire was originally mailed, please provide us your contact information in the space below so that we may also send you the Executive Summary and enter you in the raffle:

Name: _____

Title: _____

City: _____ State: _____ Zip: _____

Contact Information:

Office: _____ Cell: _____

Email: _____

APPENDIX C

SURVEY MAILINGS

Mailing artifacts, which include the consent form, pre-letter, survey cover letter, follow-up reminder letter, replacement survey and cover letter, and sample e-mails sent with the online survey URL.

MAILING 1 OF 5:

CONSENT FORM

(**Note:** The same text approved by the Institutional Review Board was used for both the paper and online versions of the consent form)

NEW JERSEY INSTITUTE OF TECHNOLOGY
323 MARTIN LUTHER KING BLVD.
NEWARK, NJ 07102-1982

CONSENT TO PARTICIPATE IN A RESEARCH STUDY *(PAPER VERSION)*

Please read the following consent form required to be completed for all NJIT research studies. Upon your agreement, on the last page, sign and date the form and kindly return to the researcher along with the completed survey.

CONSENT FORM #:

THIS NUMBER HELPS TO ENSURE THE ANONYMITY AND CONFIDENTIALITY OF THE INFORMATION YOU PROVIDE.

TITLE OF STUDY:

The Influence of Organizational and Information Systems Factors on the Effectiveness of Post-Merger Technology Integration

RESEARCH STUDY:

I have been asked to participate in a survey under the direction of Ginny A. Baro, Principal Investigator, Dr. Alok Chakrabarti and Dr. Fadi P. Deek, co-Chairs and advisors, from the New Jersey Institute of Technology, in Newark, NJ.

PURPOSE:

The purpose of this research is to investigate how ten factors influence post-merger information systems (IS) integration success between two companies. Specifically, this study looks at four organizational and six information system factors manageable by leadership teams.

DURATION:

My participation completing the survey in this study will require approximately 5-10 minutes.

PROCEDURES:

My participation in this study consists of completing a survey. The survey will assess my opinion regarding the post-merger IS integration success, the organizational and IS characteristics of the integration, and ask me to provide my merger background.

PARTICIPANTS:

I will be one of approximately 1,000 senior technology managers who will be asked to participate in this research study. I was chosen because my firm has experienced a merger.

EXCLUSIONS:

I will e-mail the researcher (providing my survey #) if any of the following apply to me:

- I have never been involved in a merger/ acquisition.
- I do not have the time to participate in this study.
- I have difficulty with the English language.

RISKS/DISCOMFORTS:

I have been told that the study described above may involve the following risks and/or discomforts: NONE

There also may be risks and discomforts that are not yet known: NONE

I fully recognize that there are risks that I may be exposed to by volunteering in this study which are inherent in participating in any study; I understand that I am not covered by NJIT's insurance policy for any injury or loss I might sustain in the course of participating in the study.

CONFIDENTIALITY:

I understand that confidential is not the same as anonymous. Confidential means that my name will not be disclosed if there exists a documented linkage between my identity and my responses as recorded in the research records. Every effort will be made to maintain the confidentiality of my study records. If the findings from the study are published, I will not be identified by name or company. My identity and my company's identity will remain confidential unless disclosure is required by law.

VIDEOTAPING/AUDIOTAPNG:

I understand that I will not be audio or video taped during this study.

PAYMENT FOR PARTICIPATION:

I have been told that I will not be paid for the time that it takes me to complete the survey. I have been told that I will receive an executive, interpretive summary of all returned questionnaires. Upon receipt of each completed survey, the researcher will make a $5 donation to the American Cancer Society. The lump-sum donation will be made in the name of the principal investigator, to keep my anonymity intact. A receipt of the donation will be included with the Executive Summary. In addition, my name will be entered in a raffle to win an *iPod nano* and a $100 iTunes gift card, for a total value of $250.

RIGHT TO REFUSE OR WITHDRAW:

I understand that my participation is voluntary and I may refuse to participate, or may discontinue my participation at any time with no adverse consequence. I also understand that the investigator has the right to withdraw me from the study at any time.

INDIVIDUALS TO CONTACT:

If I have any questions about my treatment or research procedures, I understand that I should contact the principal investigator or her dissertation advisors:

Ginny A. Baro, Principal Investigator
New Jersey Institute of Technology
College of Computing Sciences
gab0650@njit.edu
201.388.6318
http://web.njit.edu/~gab0650/

Fadi P. Deek, Ph.D.
New Jersey Institute of Technology
Dean, College of Science and Liberal Arts
Professor, Information Systems, Information Technology, Mathematical Sciences
Fadi.deek@njit.edu
973. 596.3676; http://csla.njit.edu/fadi/

Alok Chakrabarti, Ph.D.
New Jersey Institute of Technology
School of Management
Distinguished Professor
Management & Industrial Engineering
Foundation Chair in Management of Technology
chakrabarti@njit.edu
973.596.5478
http://web.njit.edu/~chakraba/

If I have any additional questions about my rights as a research subject, I may contact:
Dawn Hall, PhD, Institutional Review Board Chair
New Jersey Institute of Technology
323 Martin Luther King Boulevard
Newark, NJ 07102, hall@njit.edu, 973.642.7616

AGREEMENT OF PARTICIPANT

I have read this entire form and I understand it completely. All of my questions regarding this form or this study have been answered to my complete satisfaction. By signing, I agree to participate in this research study.

Signature: _____ Date: _____

Note: Please return this Consent Form along with the completed survey.

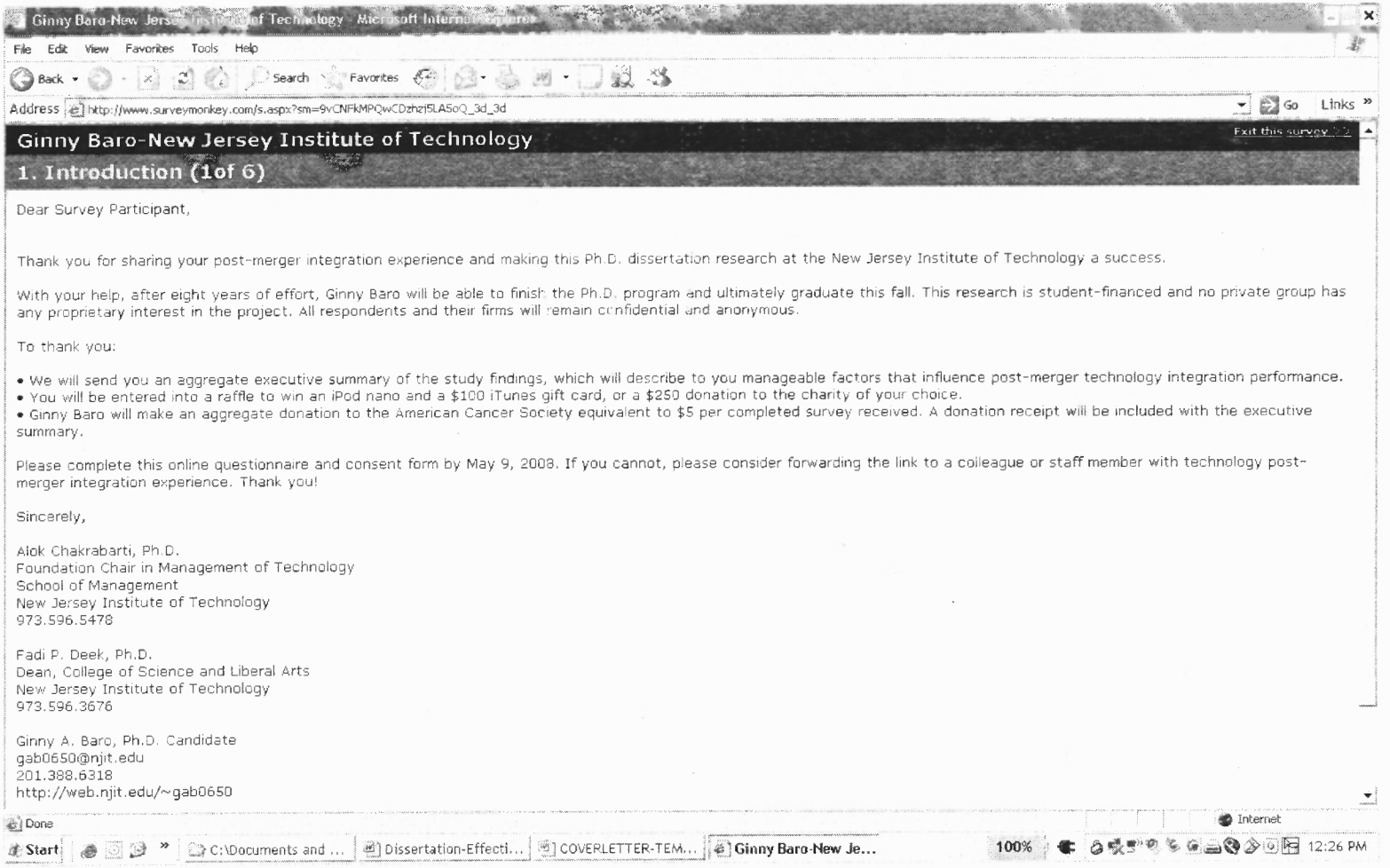
AGREEMENT OF INVESTIGATOR OR RESPONSIBLE INDIVIDUAL

To the best of my knowledge, the participant has understood the entire content of the above consent form, and comprehends the study. The participant questions have been accurately answered to his/her complete satisfaction.

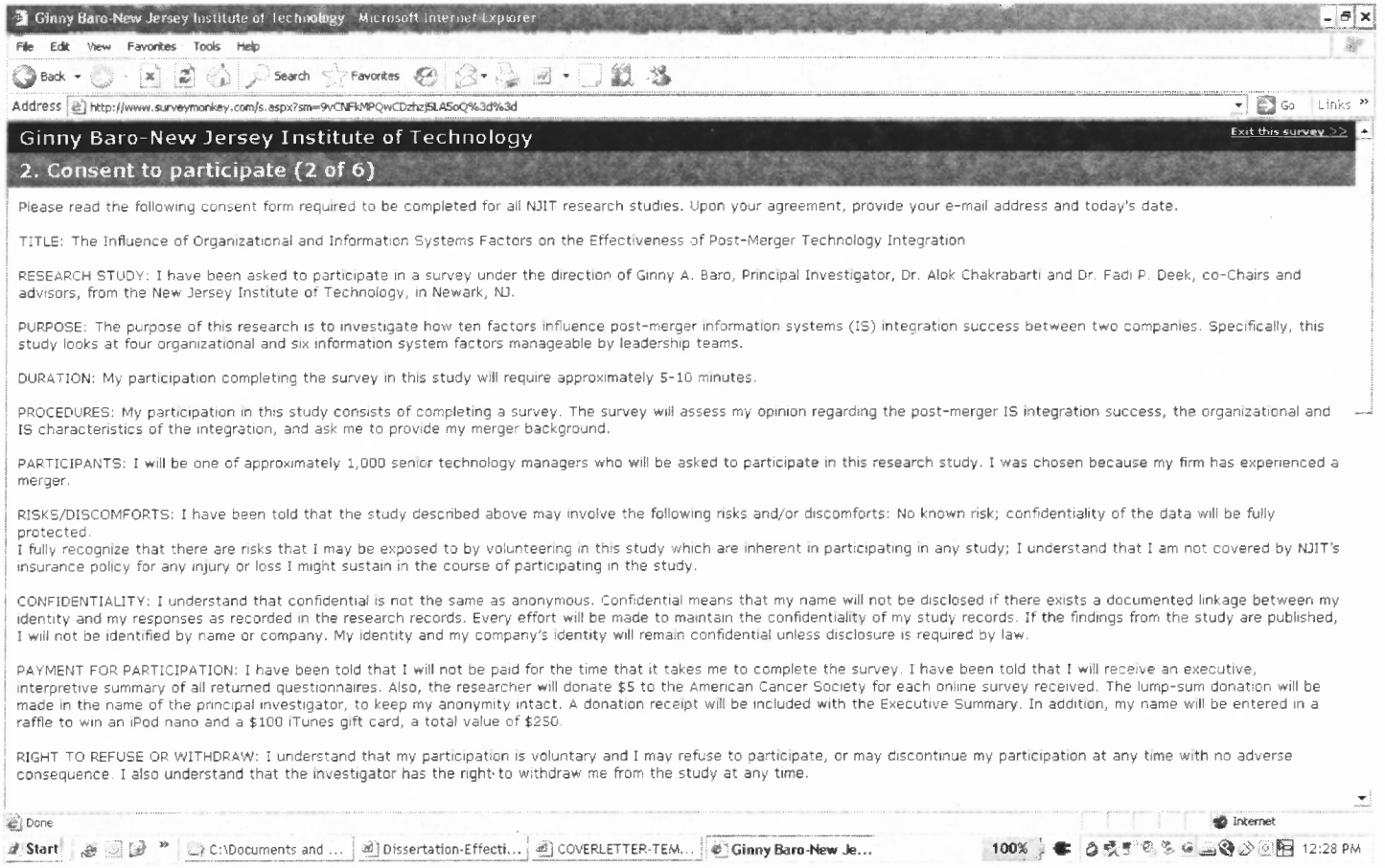
Ginny A. Baro, Principal Investigator
New Jersey Institute of Technology
201.388.6318
gab0650@njit.edu

CONSENT TO PARTICIPATE IN A RESEARCH STUDY *(ONLINE VERSION)*

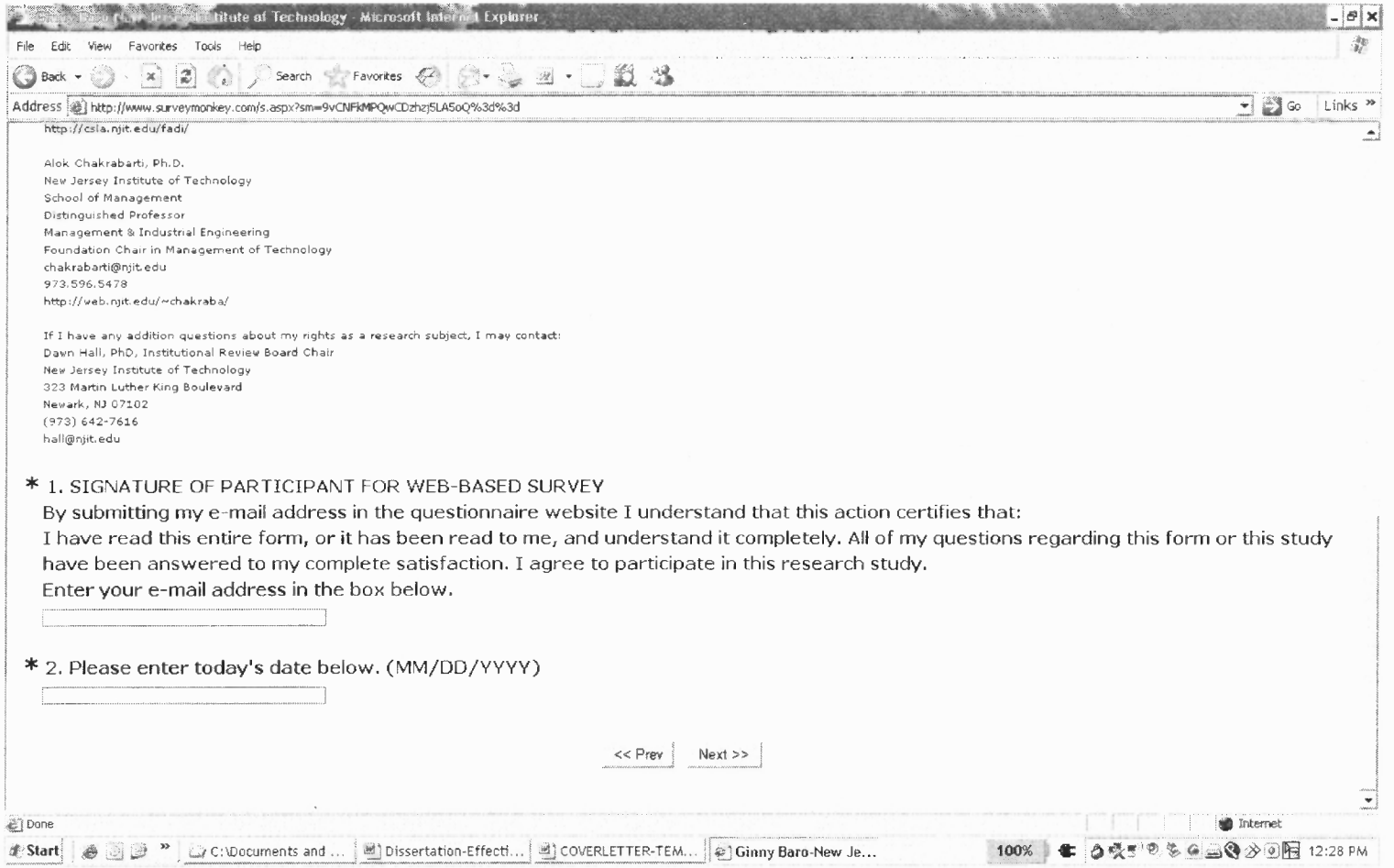
Survey Monkey - Introduction Page: End of page has a NEXT button



Online Consent: Contained the same sections/language as the paper consent form. See sample screenshot below:



At end of consent form text, participants were asked to provide their e-mail address to indicate agreement with the consent. See sample screenshot below:



MAILING 2 OF 5:

PRELETTER

NJIT New Jersey's Science & Technology University

DEPARTMENT OF INFORMATION SYSTEMS

New Jersey Institute of Technology
College of Computing Sciences
University Heights
Newark, NJ 07102
973.596.3368 Fax 973.592.2986
Gab0650@njit.edu Att: Ginny Baro
http://is.njit.edu/

«buyer_company_name» ID# «survey» January 15, 2008

«first_name» «last_name»
«title»
«address_01»
«address_02»
«address_03»
«city», «state» «zip»

Dear <FirstName> <LastName>,

A few days from now, you will receive a request in the mail to fill out a 5-10 minute questionnaire being conducted as part of an important project at the New Jersey Institute of Technology. No private group has any proprietary interest in the project.

We are contacting senior technology management team members at firms that have experienced a merger or acquisition. If you were involved with the post-merger IS integration for the M&A with *«seller_company_name»*, or for any other M&A your company has experienced, you are most qualified to assist and benefit from this study. **The findings will reveal to you manageable factors which influence the success of post-merger information systems integration.**

The questionnaire asks only for general information about the technology integration that your company experienced as a result of a merger and is not seeking any proprietary information about your firm or its technologies.

We are writing in advance because we have found that many people like to know ahead of time that they will be contacted. Thank you for your time and consideration. It is only with the generous help of experienced, senior technology professionals like you that our research can be successful.

Sincerely,

Alok Chakrabarti, Ph.D.
Distinguished Professor
Management & Industrial Engineering
Foundation Chair in Management of Technology
School of Management
New Jersey Institute of Technology
973.596.5478

Fadi P. Deek, Ph.D.
Dean, College of Science and Liberal Arts
Professor, Information Systems, Information Technology, Mathematical Sciences
New Jersey Institute of Technology
973.596.3676

Ginny A. Baro, Ph.D. Candidate
New Jersey Institute of Technology
gab0650@njit.edu, 201-388-6318

MAILING 3 OF 5:

COVER LETTER TO ACCOMPANY PAPER SURVEY

NJIT New Jersey's Science & Technology University

DEPARTMENT OF INFORMATION SYSTEMS

New Jersey Institute of Technology
College of Computing Sciences
University Heights
Newark, NJ 07102
973.596.3368 Fax 973.592.2986
Gab0650@njit.edu Att: Ginny Baro
http://is.njit.edu/

«buyer_company_name» ID# «survey» January 22, 2008

Dear «first_name» «last_name»,

I am writing to ask for your help completing a 5-10 minutes questionnaire asking about the post-merger technology integration between *«seller_company_name»* and your firm. This study is being conducted as part of a **Ph.D. dissertation** effort at the New Jersey Institute of Technology (NJIT). No private group has any proprietary interest in this project. We need your feedback in order to obtain meaningful results and to help us improve our understanding of post-merger technology integrations.

Eight years ago, I began a self-financed Ph.D. program in Information Systems at NJIT while working full time as a Software Engineer Manager. Today, **your response will also help me to successfully complete the Ph.D. dissertation and graduate this fall.**

As «title», I understand that you are very busy, which is why I would greatly appreciate if you spend 5-10 minutes of your valuable time sharing your experience by completing the enclosed questionnaire.

As a small token of my gratitude, I will mail you an executive summary of the study findings, which will describe to you manageable factors that influence post-merger technology integration performance. I will also make an aggregate donation to the American Cancer Society equivalent to $5 per completed survey and consent form I receive.

In addition, all returned questionnaires will be entered into a raffle to win an *iPod nano,* holding up to five hours of podcasts, TV shows, music videos, and movies, and accompanied by a $100 iTunes gift card, for a total value of $250.

Since the validity of the results depends on obtaining a high rate of response, if you are unable to answer the survey, please check one of the reasons below and return this letter in the enclosed postage-paid envelope so that I may remove your name from the research sample.

O Firm experienced no integration O I was not involved in the integration O I prefer not to answer
O Answering surveys is against firm policy O Other: _____

Otherwise, I hope to receive your completed questionnaire and consent form by **February 8, 2008.** I thank you for your consideration. For more information about this study, my background, and the dissertation committee guiding this important academic research project, please visit http://web.njit.edu/~gab0650.
Sincerely,

Ginny A. Baro, Ph.D. Candidate
New Jersey Institute of Technology
Ginny A. Baro, Ph.D. Candidate
gab0650@njit.edu, 201-388-6318

MAILING 4 OF 5:

REMINDER LETTER AND THANK YOU

NJIT New Jersey's Science & Technology University

DEPARTMENT OF INFORMATION SYSTEMS

New Jersey Institute of Technology
College of Computing Sciences
University Heights
Newark, NJ 07102
973.596.3368 Fax 973.592.2986
Gab0650@njit.edu Att: Ginny Baro
http://is.njit.edu/

Department Office
GITC Building, Suite 5500

«buyer_company_name» ID# «survey»

February 4, 2008

«first_name» «last_name»
«title»
«address_01»
«address_02»
«address_03»
«city», «state» «zip»

Last week, a brief questionnaire seeking information about the post-merger technology integration at your firm was mailed to you. We are contacting a random sample of senior technology management team members at firms that have experienced a merger or acquisition. As someone fitting the criteria, you are most qualified to assist and benefit from this study.

If you have already completed and returned the questionnaire to us, please accept our sincere thanks. If not, please do so today. **As a study participant, you will receive an executive, interpretive summary of the findings, which will describe to you manageable factors that influence post-M&A technology integration success**, allowing your team to manage them more closely during an M&A event; no specific M&A firms will be identified in the summary report.

We are especially grateful for your help because it is only with input from experienced senior technology professionals like you that we are able to better understand post-merger technology integrations and complete this dissertation research effort.

If your firm did not experience technology integration as a result of the M&A with *«seller_company_name»*, or with any other company, or if you are unable to answer the survey for any other reason, please check the appropriate box below and return this letter in the enclosed postage-paid envelope so that we may remove your name from the research sample.

O Firm experienced no integration O I was not involved in the integration O I prefer not to answer

O Answering surveys is against firm policy O Other: _____

Otherwise, we hope that you will fill out and return the questionnaire and consent form by next week, **February 15th**. If you did not receive a questionnaire, or if it was misplaced, please call us at 201-388-6318 or e-mail us at gab0650@njit.edu and we will mail you one today.

Ginny A. Baro, Ph.D. Candidate
New Jersey Institute of Technology
gab0650@njit.edu, 201-388-6318

MAILING 5 OF 5:

COVER LETTER TO ACCOMPANY REPLACEMENT SURVEY

NJIT New Jersey's Science & Technology University

DEPARTMENT OF INFORMATION SYSTEMS

New Jersey Institute of Technology
College of Computing Sciences
University Heights
Newark, NJ 07102
973.596.3368 Fax 973.592.2986
Gab0650@njit.edu Att: Ginny Baro
http://is.njit.edu/

«buyer_company_name» ID# «survey» March 3, 2008

Dear «first_name» «last_name»,

I am writing to ask for your help completing a 5-10 minutes questionnaire asking about the post-merger technology integration between *«seller_company_name»* and your firm. This study is being conducted as part of a **Ph.D. dissertation** effort at the New Jersey Institute of Technology (NJIT). No private group has any proprietary interest in this project. We need your feedback in order to obtain meaningful results and to help us improve our understanding of post-merger technology integrations.

Eight years ago, I began a self-financed Ph.D. program in Information Systems at NJIT while working full time as a Software Engineer Manager. Today, your response will also help me to successfully complete the Ph.D. dissertation and graduate this fall.

As «title», I understand that you are very busy, which is why I would greatly appreciate if you spend 5-10 minutes of your valuable time sharing your experience by completing the enclosed questionnaire.
As a small token of my gratitude, I will mail you an executive summary of the study findings, which will describe to you manageable factors that influence post-merger technology integration performance. I will also make an aggregate donation to the American Cancer Society equivalent to $5 per completed survey and consent form I receive.

In addition, all returned questionnaires will be entered into a raffle to win an *iPod nano*, holding up to five hours of podcasts, TV shows, music videos, and movies, and accompanied by a $100 iTunes gift card, for a total value of $250.

Since the validity of the results depends on obtaining a high rate of response, if you are unable to answer the survey, please check one of the reasons below and return this letter in the enclosed postage-paid envelope so that I may remove your name from the research sample.

O Firm experienced no integration O I was not involved in the integration O I prefer not to answer
O Answering surveys is against firm policy O Other: _____

Otherwise, I hope to receive your completed questionnaire and consent form by **March 15, 2008**. I thank you for your consideration. For more information about this study, my background, and the dissertation committee guiding this important academic research project, please visit http://web.njit.edu/~gab0650.
Sincerely,

Ginny A. Baro, Ph.D. Candidate
New Jersey Institute of Technology
gab0650@njit.edu, 201-388-6318

ONLINE SURVEY

SAMPLE E-MAILS SENT ALONG WITH THE SURVEY URL

From: Gianilda Baro [mailto:gab0650@njit.edu]

Subject: Identifying Manageable Factors that influence Technology Integration after a M&A

Integrating the technology between two companies after a merger or acquisition is not well understood.

This Ph.D. dissertation study identifies manageable factors which influence technology integrations after a M&A.

You can make a big difference by taking five minutes to complete this online survey by May 9th.

The survey results will be insightful and help your team in future technology integrations. All data will be reported in aggregate and your feedback is confidential:
http://www.surveymonkey.com/s.aspx?sm=9vCNFkMPQwCDzhzj5LA5oQ_3d_3d

The survey link describes three ways in which I will thank you for your participation.

Please do not dismiss this e-mail if you have been involved in a technology integration after a M&A. But if you haven't, please consider forwarding this email to a colleague and e-mail me at gab0650@njit.edu and I'll remove you from the research sample.

Only with your participation will I be able to finish this study and graduate this fall.

Thank you,

Ginny Baro, Ph.D. candidate
New Jersey Institute of Technology
201-388-6318
gab0650@njit.edu
http://web.njit.edu/~gab0650/

From: Gianilda Baro [mailto:gab0650@njit.edu]

Subject: Technology Integration after a M&A

You can help by filling out the confidential survey and making this Ph.D. study statistically valid. If you have experienced a Technology integration, you can help.

http://www.surveymonkey.com/s.aspx?sm=9vCNFkMPQwCDzhzj5LA5oQ_3d_3d

If you have not been involved, you can also help by replying to this email so that I may remove you from the research sample and improve the survey response rate.

You will:
- receive an executive summary of the findings
- enter a raffle to win a $250 iPod Nano & iTunes gift card, or
- win a $250 donation to your favorite charity/ties.
- contribute $5 to be donated to the American Cancer Society for your completed survey

http://www.surveymonkey.com/s.aspx?sm=9vCNFkMPQwCDzhzj5LA5oQ_3d_3d

Sincerely,

Ginny Baro, Ph.D. candidate
New Jersey Institute of Technology
201-388-6318
gab0650@njit.edu
http://web.njit.edu/~gab0650/

APPENDIX D

DESCRIPTIVE STATISTICS

Descriptive statistics for the demographic questions on the survey, including: title during the IS integration, acquirer main business, target main business, experience in IS Management, experience with IS integration, and M&A experience.

Table D.1 Q21 Title During IS Integration

Q21 Title During IS Integration		
N	Valid	102
	Missing	0

Q21 Title During IS Integration	Frequency	Percent	Valid Percent	Cumulative Percent
VP	30	29.4	29.4	29.4
Director	13	12.7	12.7	42.2
CTO	12	11.8	11.8	53.9
CIO	10	9.8	9.8	63.7
SVP	10	9.8	9.8	73.5
EVP	6	5.9	5.9	79.4
IT Leader	3	2.9	2.9	82.4
President	3	2.9	2.9	85.3
	2	2.0	2.0	87.3
Manager	2	2.0	2.0	89.2
Project Manager	2	2.0	2.0	91.2
Senior Director	2	2.0	2.0	93.1
Chairman and CEO	1	1.0	1.0	94.1
COO	1	1.0	1.0	95.1
Fellow	1	1.0	1.0	96.1
General Manager	1	1.0	1.0	97.1

Table D.1 Q21 Title During IS Integration (Continued)

Head of Technology	1	1.0	1.0	98.0
Senior VP	1	1.0	1.0	99.0

Q21 Title During IS Integration	Frequency	Percent	Valid Percent	Cumulative Percent
Technology Partner	1	1.0	1.0	100.0
Total	102	100.0	100.0	

Table D.2 Frequencies

		Acquirer Main Business	Target Main Business	M&A Year	Company Role
N	Valid	102	102	101	101
	Missing	0	0	1	1

Table D.3 Acquirer's Main Business

Acquirer Main Business	Frequency	Percent	Valid Percent	Cumulative Percent
Software	15	14.7	14.7	14.7
Financial Services	9	8.8	8.8	23.5
Information Technology	7	6.9	6.9	30.4
Banking	4	3.9	3.9	34.3
Management Consulting Services	4	3.9	3.9	38.2
Semiconductors	3	2.9	2.9	41.2
Computer integrated systems design	2	2.0	2.0	43.1
Computer Services	2	2.0	2.0	45.1
Defense	2	2.0	2.0	47.1
Hardware	2	2.0	2.0	49.0
Information Technology consulting	2	2.0	2.0	51.0
Information Technology Consulting	2	2.0	2.0	52.9
Insurance	2	2.0	2.0	54.9
Market Research	2	2.0	2.0	56.9

Table D.3 Acquirer's Main Business (Continued)

Acquirer Main Business	Frequency	Percent	Valid Percent	Cumulative Percent
Professional Services	2	2.0	2.0	58.8
Advertising	1	1.0	1.0	59.8
Application Service Provider	1	1.0	1.0	60.8
Automotive Tires and Services	1	1.0	1.0	61.8
Banking & Security Equipment	1	1.0	1.0	62.7
Business Consulting	1	1.0	1.0	63.7
Business services	1	1.0	1.0	64.7
Commercial Banking	1	1.0	1.0	65.7
Communication services	1	1.0	1.0	66.7
Computer programming services	1	1.0	1.0	67.6
Computer Programming Services	1	1.0	1.0	68.6
Computer services	1	1.0	1.0	69.6
Credit reporting services	1	1.0	1.0	70.6
Data Processing	1	1.0	1.0	71.6
Data processing and preparation	1	1.0	1.0	72.5
Electronics	1	1.0	1.0	73.5
Electronics/EDA	1	1.0	1.0	74.5
Employment Agencies	1	1.0	1.0	75.5
Financial services	1	1.0	1.0	76.5
Hardware and Software	1	1.0	1.0	77.5
Healthcare	1	1.0	1.0	78.4
High Technology	1	1.0	1.0	79.4
Hospital and Medical Services	1	1.0	1.0	80.4
Hosting	1	1.0	1.0	81.4
Industrial cyber-security	1	1.0	1.0	82.4
Information Retrieval	1	1.0	1.0	83.3
Internet	1	1.0	1.0	84.3
Investors	1	1.0	1.0	85.3
Logistics	1	1.0	1.0	86.3
Medical Laboratories	1	1.0	1.0	87.3

Table D.3 Acquirer's Main Business (Continued)

Acquirer Main Business	Frequency	Percent	Valid Percent	Cumulative Percent
Periodicals	1	1.0	1.0	88.2
Programming Services	1	1.0	1.0	89.2
Publishing	1	1.0	1.0	90.2
Radio and TV Communication	1	1.0	1.0	91.2
Rail Transportation	1	1.0	1.0	92.2
Software and Hardware	1	1.0	1.0	93.1
Systems Design	1	1.0	1.0	94.1
Technology / networking	1	1.0	1.0	95.1
Telecommunications	1	1.0	1.0	96.1
Telecommunications Network Equipment	1	1.0	1.0	97.1
Tissue Diagnostics	1	1.0	1.0	98.0
Title insurance	1	1.0	1.0	99.0
Transportation	1	1.0	1.0	100.0
Total	102	100.0	100.0	

Table D.4 Merger Target's Main Business

Target Main Business	Frequency	Percent	Valid Percent	Cumulative Percent
Software	17	16.7	16.7	16.7
Financial Services	8	7.8	7.8	24.5
Hardware	5	4.9	4.9	29.4
Banking	4	3.9	3.9	33.3
Information Technology	4	3.9	3.9	37.3
Management Consulting Services	4	3.9	3.9	41.2
Insurance	3	2.9	2.9	44.1
	2	2.0	2.0	46.1
Advertising	2	2.0	2.0	48.0
Computer Services	2	2.0	2.0	50.0
Defense	2	2.0	2.0	52.0
Hardware and Software	2	2.0	2.0	53.9

Table D.4 Merger Target's Main Business (Continued)

Target Main Business	Frequency	Percent	Valid Percent	Cumulative Percent
Information Technology Consulting	2	2.0	2.0	55.9
Market Research	2	2.0	2.0	57.8
Professional Services	2	2.0	2.0	59.8
Application Service Provider	1	1.0	1.0	60.8
Automotive Tires and Services	1	1.0	1.0	61.8
Barcode/EFID/POS	1	1.0	1.0	62.7
Business consulting	1	1.0	1.0	63.7
Business Consulting	1	1.0	1.0	64.7
Business services	1	1.0	1.0	65.7
Business Services	1	1.0	1.0	66.7
Commercial Banking	1	1.0	1.0	67.6
Communication services	1	1.0	1.0	68.6
Computer programming services	1	1.0	1.0	69.6
Computer Programming Services	1	1.0	1.0	70.6
Content Delivery	1	1.0	1.0	71.6
Data processing	1	1.0	1.0	72.5
Development	1	1.0	1.0	73.5
Electronics	1	1.0	1.0	74.5
Electronics/EDA	1	1.0	1.0	75.5
Employment agencies	1	1.0	1.0	76.5
Financial services	1	1.0	1.0	77.5
Food Catering	1	1.0	1.0	78.4
Healthcare	1	1.0	1.0	79.4
High Technology	1	1.0	1.0	80.4
Hospital and Medical Services	1	1.0	1.0	81.4
Hosting	1	1.0	1.0	82.4
Industrial cyber-security	1	1.0	1.0	83.3
Information Retrieval	1	1.0	1.0	84.3
Information Technology Consulting	1	1.0	1.0	85.3

Table D.4 Merger Target's Main Business (Continued)

Target Main Business	Frequency	Percent	Valid Percent	Cumulative Percent
Internet	1	1.0	1.0	86.3
Investors	1	1.0	1.0	87.3
Mobile Resource Management	1	1.0	1.0	88.2
Periodicals	1	1.0	1.0	89.2
Pharmaceuticals	1	1.0	1.0	90.2
Publishing	1	1.0	1.0	91.2
Radio and TV Communication	1	1.0	1.0	92.2
Rail Transportation	1	1.0	1.0	93.1
Systems Design	1	1.0	1.0	94.1
Technology / Networking	1	1.0	1.0	95.1
Telecommunications Network Equipment	1	1.0	1.0	96.1
Tissue Diagnostics / Pharmaceuticals	1	1.0	1.0	97.1
Title insurance	1	1.0	1.0	98.0
Transportation	1	1.0	1.0	99.0
VOIP	1	1.0	1.0	100.0
Total	102	100.0	100.0	

Table D.5 Q22 Experience in IS Management; Q23 Experience with IS Integration; Q24 M&A Experience

	N	Minimum	Maximum	Mean	Std. Deviation
Q22 Experience In IS Mngt	100	0	36	18.77	7.860
Q23 Experience with IS Integration	99	0	42	12.92	7.966
Q24 M&A Experience	102	1	40	8.26	7.894
Valid N (listwise)	99				

Table D.6 Year of M&A

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2006	38	37.3	37.6	37.6
	2005	33	32.4	32.7	70.3
	2007	10	9.8	9.9	80.2
	1998	4	3.9	4.0	84.2
	2000	3	2.9	3.0	87.1
	2001	3	2.9	3.0	90.1
	2002	3	2.9	3.0	93.1
	2004	3	2.9	3.0	96.0
	2003	2	2.0	2.0	98.0
	2008	2	2.0	2.0	100.0
	Total	101	99.0	100.0	
Missing	System	1	1.0		
Total		102	100.0		

Table D.7 Respondent's Company Role

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Acquirer	90	88.2	89.1	89.1
	Target	11	10.8	10.9	100.0
	Total	101	99.0	100.0	
Missing	System	1	1.0		
Total		102	100.0		

Table D.8 Q19 – 1st Factor/Issue with Positive Impact on the overall IS integration

Q19PositiveFactor1		
N	Valid	102
	Missing	0

Q19PositiveFactor1	Frequency	Percent	Valid Percent	Cumulative Percent
	36	35.3	35.3	35.3
Quality Planning	13	12.7	12.7	48.0
Quality Communication	4	3.9	3.9	52.0
Top Management Support	4	3.9	3.9	55.9
Financial Support / Fiscal Responsibility	3	2.9	2.9	58.8
Knowledgeable IT Staff	3	2.9	2.9	61.8
Merger Experience	3	2.9	2.9	64.7
Prompt Decision Making	3	2.9	2.9	67.6
Retain Key Personnel	3	2.9	2.9	70.6
Absorption Strategy	2	2.0	2.0	72.5
End-User Support	2	2.0	2.0	74.5
Expanded Product Portfolio	2	2.0	2.0	76.5
IS Participation in Merger Planning	2	2.0	2.0	78.4
Structured IS Integration Plan	2	2.0	2.0	80.4
Technology-Common Technology Platforms	2	2.0	2.0	82.4
Technology-Using Target's IT Systems	2	2.0	2.0	84.3
Centralized Standards	1	1.0	1.0	85.3
Fast Integration	1	1.0	1.0	86.3
Good planning	1	1.0	1.0	87.3
Leverage Corporate	1	1.0	1.0	88.2
Merger Motive	1	1.0	1.0	89.2
Products' Synergy	1	1.0	1.0	90.2
Quality of Communication Activities to IS	1	1.0	1.0	91.2
Repetitive Process	1	1.0	1.0	92.2
Seamless to Users	1	1.0	1.0	93.1
Similar Cultures	1	1.0	1.0	94.1
Similar technologies	1	1.0	1.0	95.1

Table D.8 Q19 – 1st Factor/Issue with Positive Impact on the overall IS integration (Continued)

Q19PositiveFactor1	Frequency	Percent	Valid Percent	Cumulative Percent
Structured Integration Plan	1	1.0	1.0	96.1
Technology-Core Business Systems Unchanged	1	1.0	1.0	97.1
Technology-Data Integration	1	1.0	1.0	98.0
Technology-Upgrade Legacy Systems	1	1.0	1.0	99.0
Well Defined Leadership	1	1.0	1.0	100.0
Total	102	100.0	100.0	

	N	Minimum	Maximum	Mean	Std. Deviation
Q19aPos Rating 1	65	4	7	5.94	.864
Valid N (listwise)	65				

Table D.9 Q19 – 2nd Factor/Issue with Positive Impact on the overall IS integration

Q19PosFactor2		
N	Valid	102
	Missing	0

Q19PosFactor2	Frequency	Percent	Valid Percent	Cumulative Percent
	50	49.0	49.0	49.0
Quality Planning	5	4.9	4.9	53.9
Quality Communication	4	3.9	3.9	57.8
Structured Integration Plan	4	3.9	3.9	61.8
Technology-Common Technology Platforms	4	3.9	3.9	65.7
Knowledgeable IT Staff	3	2.9	2.9	68.6
Teamwork	3	2.9	2.9	71.6
Business Process Analysis	2	2.0	2.0	73.5
Financial Support / Fiscal Responsibility	2	2.0	2.0	75.5
Prompt Decision Making	2	2.0	2.0	77.5
Well Defined Leadership	2	2.0	2.0	79.4
Commitment of IT team	1	1.0	1.0	80.4

Table D.9 Q19 – 2nd Factor/Issue with Positive Impact on the overall IS integration (Continued)

Q19PosFactor2	Frequency	Percent	Valid Percent	Cumulative Percent
Data Center Migration	1	1.0	1.0	81.4
Desire to Succeed	1	1.0	1.0	82.4
End-User Support	1	1.0	1.0	83.3
Explain Merger Strategy	1	1.0	1.0	84.3
IS Participation in Merger Planning	1	1.0	1.0	85.3
Larger User Base	1	1.0	1.0	86.3
No Business Down Time	1	1.0	1.0	87.3
No Custom Products	1	1.0	1.0	88.2
Operating Synergies	1	1.0	1.0	89.2
Positive Attitude	1	1.0	1.0	90.2
Removing Bureaucracy	1	1.0	1.0	91.2
Retain Key Personnel	1	1.0	1.0	92.2
Similar Cultures	1	1.0	1.0	93.1
Take over failing projects	1	1.0	1.0	94.1
Technology-Absorption Strategy	1	1.0	1.0	95.1
Technology-Sophisticated Systems	1	1.0	1.0	96.1
Technology-Systems Uptime	1	1.0	1.0	97.1
Technology-Target Systems	1	1.0	1.0	98.0
Top Management Support	1	1.0	1.0	99.0
Training	1	1.0	1.0	100.0
Total	102	100.0	100.0	

	N	Minimum	Maximum	Mean	Std. Deviation
Q19bPos Rating 2	51	4	7	6.00	.849
Valid N (listwise)	51				

Table D.10 Q19 – 3rd Factor/Issue with Positive Impact on the overall IS integration

Q19PosFactor3		
N	Valid	102
	Missing	0

Q19PosFactor3	Frequency	Percent	Valid Percent	Cumulative Percent
	61	59.8	59.8	59.8
Top Management Support	4	3.9	3.9	63.7
Quality Planning	3	2.9	2.9	66.7
Retain Key Personnel	3	2.9	2.9	69.6
End-User Support	2	2.0	2.0	71.6
Positive Attitude	2	2.0	2.0	73.5
Teamwork	2	2.0	2.0	75.5
Technology-Common Technology Platforms	2	2.0	2.0	77.5
Best of Breed Integration Strategy	1	1.0	1.0	78.4
Best-of-breed approach to IS integration	1	1.0	1.0	79.4
End-User Participation in IS Integration	1	1.0	1.0	80.4
IT leadership	1	1.0	1.0	81.4
IT Technical competence	1	1.0	1.0	82.4
Limited Product Development	1	1.0	1.0	83.3
Long Integration Timeframe	1	1.0	1.0	84.3
Management Understanding of IS Integration	1	1.0	1.0	85.3
Merger Experience	1	1.0	1.0	86.3
Organizational Integration	1	1.0	1.0	87.3
Prioritizing	1	1.0	1.0	88.2
Provide stable services	1	1.0	1.0	89.2
Quality Communication	1	1.0	1.0	90.2
Responsiveness to Business	1	1.0	1.0	91.2
Structured Integration Plan	1	1.0	1.0	92.2
Structured IS Integration Plan	1	1.0	1.0	93.1

Table D.10 Q19 – 3rd Factor/Issue with Positive Impact on the overall IS integration (Continued)

Q19PosFactor3	Frequency	Percent	Valid Percent	Cumulative Percent
Technology-Data Integration	1	1.0	1.0	94.1
Technology-Keep All Hardware for a While	1	1.0	1.0	95.1
Technology-Limit Upgrades	1	1.0	1.0	96.1
Technology-Little Redundancy	1	1.0	1.0	97.1
Transform Integration Strategy	1	1.0	1.0	98.0
Vendor Support	1	1.0	1.0	99.0
Well Defined Leadership	1	1.0	1.0	100.0
Total	102	100.0	100.0	

	N	Minimum	Maximum	Mean	Std. Deviation
Q19cPos Rating 3	40	4	7	5.65	.949
Valid N (listwise)	40				

Table D.11 Q20 – 1st Factor/Issue with Negative Impact on the overall IS integration

Statistics

		Q20NegativeFactor1	Q20bTop Issue (negative)2	Q20cTop Issue (negative)3
N	Valid	102	102	102
	Missing	0	0	0

20NegativeFactor1	Frequency	Percent	Valid Percent	Cumulative Percent
	36	35.3	35.3	35.3
Technology-Different Technology Platforms	9	8.8	8.8	44.1
Poor Planning	8	7.8	7.8	52.0
Poor Communication	7	6.9	6.9	58.8
Poor Integration	6	5.9	5.9	64.7
Lack of Training	3	2.9	2.9	67.6

Table D.11 Q20 – 1st Factor/Issue with Negative Impact on the overall IS integration (Continued)

20NegativeFactor1	Frequency	Percent	Valid Percent	Cumulative Percent
Not Retaining Key Personnel	3	2.9	2.9	70.6
Poor Due Diligence	3	2.9	2.9	73.5
Resistance to Change	3	2.9	2.9	76.5
Unreasonable Timeframe	3	2.9	2.9	79.4
Geography of Companies	2	2.0	2.0	81.4
Lack of Integration	2	2.0	2.0	83.3
Aborption Integration Strategy	1	1.0	1.0	84.3
Different Maturity IT Organizations	1	1.0	1.0	85.3
Different Merger Motives	1	1.0	1.0	86.3
Different Organizational Structures	1	1.0	1.0	87.3
Geography of Companies	1	1.0	1.0	88.2
Lack of Common Goal	1	1.0	1.0	89.2
Lack of Resources	1	1.0	1.0	90.2
Lack of Top Management Support	1	1.0	1.0	91.2
Management support	1	1.0	1.0	92.2
New Processes	1	1.0	1.0	93.1
New Product Requests	1	1.0	1.0	94.1
Staff Lacking Knowledge	1	1.0	1.0	95.1
Resistance to Change	1	1.0	1.0	96.1
Technology-Lack of Integration Tools	1	1.0	1.0	97.1
Technology-Systems Complexity	1	1.0	1.0	98.0
Technology-Systems Retained	1	1.0	1.0	99.0
Unresponsive Key Vendor	1	1.0	1.0	100.0
Total	102	100.0	100.0	

Table D.12 Q20 – 2nd Factor/Issue with Negative Impact on the overall IS integration

Q20bTop Issue (negative)2	Frequency	Percent	Valid Percent	Cumulative Percent
	58	56.9	56.9	56.9
Resistance to Change	4	3.9	3.9	60.8
Staff Lacking Knowledge	3	2.9	2.9	63.7
Poor Communication	3	2.9	2.9	66.7
Poor Due Diligence	3	2.9	2.9	69.6
Unreasonable Timeframe	3	2.9	2.9	72.5
Geography of Companies	2	2.0	2.0	74.5
Not Retaining Key Personnel	2	2.0	2.0	76.5
Poor Integration	2	2.0	2.0	78.4
Technology-Different Technnology Platforms	2	2.0	2.0	80.4
Absorption Integration Strategy	1	1.0	1.0	81.4
Culture Clash	1	1.0	1.0	82.4
Different Maturity IT Organizations	1	1.0	1.0	83.3
Different Organizational Structures	1	1.0	1.0	84.3
Focused Areas for Growth for New Acquired Company	1	1.0	1.0	85.3
Gap Functionality	1	1.0	1.0	86.3
Integration Cost	1	1.0	1.0	87.3
Lack of Financial Resources	1	1.0	1.0	88.2
Lack of Innovation	1	1.0	1.0	89.2
Lack of Teamwork	1	1.0	1.0	90.2
Lack of Top Management Support	1	1.0	1.0	91.2
Lack of Training	1	1.0	1.0	92.2
Lack of Well Defined Leadership	1	1.0	1.0	93.1
Multiple Mergers Simultaneously	1	1.0	1.0	94.1
Political Compromise	1	1.0	1.0	95.1
Poort Integration	1	1.0	1.0	96.1
Technology-Absolete Systems	1	1.0	1.0	97.1

Table D.12 Q20 – 2nd Factor/Issue with Negative Impact on the overall IS integration (Continued)

Q20bTop Issue (negative)2	Frequency	Percent	Valid Percent	Cumulative Percent
Technology-Lack of Integration Tools	1	1.0	1.0	98.0
Technology-Oursourced Systems	1	1.0	1.0	99.0
Too Much Training	1	1.0	1.0	100.0
Total	102	100.0	100.0	

Table D.13 Q20 – 3rd Factor/Issue with Negative Impact on the overall IS integration

Q20cTop Issue (negative)3	Frequency	Percent	Valid Percent	Cumulative Percent
	68	66.7	66.7	66.7
Technology-Different Technology Platforms	9	8.8	8.8	75.5
Resistance to Change	4	3.9	3.9	79.4
Lack of Well Defined Leadership	2	2.0	2.0	81.4
Staff lacking knowledge	2	2.0	2.0	83.3
Not Retaining Key Personnel	2	2.0	2.0	85.3
Poor Planning	2	2.0	2.0	87.3
Different Merger Motives	1	1.0	1.0	88.2
Different Organizational Structures	1	1.0	1.0	89.2
Gaining Trust of New Organization	1	1.0	1.0	90.2
Ignoring End-User	1	1.0	1.0	91.2
Lack of End-User Training	1	1.0	1.0	92.2
Lack of Experience	1	1.0	1.0	93.1
Lack of Top Management Support	1	1.0	1.0	94.1
Lack of Training	1	1.0	1.0	95.1
Poor Due Diligence	1	1.0	1.0	96.1
Reorganization of IT	1	1.0	1.0	97.1
Standards Adoption	1	1.0	1.0	98.0

Table D.13 Q20 – 3rd Factor/Issue with Negative Impact on the overall IS integration (Continued)

Q20cTop Issue (negative)3	Frequency	Percent	Valid Percent	Cumulative Percent
Technology-Delayed Elimination of Local Telecom Services	1	1.0	1.0	99.0
Technology-Physical Rellocation of Equipment	1	1.0	1.0	100.0
Total	102	100.0	100.0	

	N	Minimum	Maximum	Mean	Std. Deviation
Q20aNeg Rating 1	65	2	7	5.37	1.126
Q20bNeg Rating 2	45	1	7	5.38	1.211
Q20cNeg Rating 3	35	1	7	5.23	1.457
Valid N (listwise)	34				

Table D.14 Company Involved in Other M&As at the Same Time

Statistics		
Other MA's		
N	Valid	101
	Missing	1

	Other MA's	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	56	54.9	55.4	55.4
	Yes	45	44.1	44.6	100.0
	Total	101	99.0	100.0	
Missing	System	1	1.0		
Total		102	100.0		

Table D.15 Q8 Role of IS Dpt in Decision to Merger & Q9 Relative Importance of IS integration to Merger Success

	Mean	Std. Deviation	N
Q8CoRole	2.90	1.821	102
Q9RelativeImportanceOfISInteg ration	4.82	1.685	102

APPENDIX E

FACTOR ANALYSIS STATISTICS

Statistics from a confirmatory principal component factor analysis utilizing Varimax rotation with Kaiser normalization conducted on the 20 questions measuring the five IS Integration Success measures depicted in the Conceptual Model (Chapter 3, Figure 3).

Table E.1 Communalities

	Initial	Extraction
Q1aISIntegrationSuccess	1.000	.639
Q1bISIntegrationSuccess	1.000	.679
Q1cISIntegrationSuccess	1.000	.678
Q1dISIntegrationSuccess	1.000	.695
Q1eISIntegrationSuccess	1.000	.668
Q1fISIntegrationSuccess	1.000	.739
Q1gISIntegrationSuccess	1.000	.731
Q1hISIntegrationSuccess	1.000	.764
Q1iISIntegrationSuccess	1.000	.610
Q1jISIntegrationSuccess	1.000	.758
Q1kISIntegrationSuccess	1.000	.545
Q1lISIntegrationSuccess	1.000	.417

Table E.1 Communalities (Continued)

	Initial	Extraction
Q2aISIntegrationSuccess	1.000	.707
Q2bISIntegrationSuccess	1.000	.664
Q4aISIntegrationSuccess	1.000	.530
Q4bISIntegrationSuccess	1.000	.594
Q3aISIntegrationSuccess	1.000	.700
Q3bISIntegrationSuccess	1.000	.730
Q3cISIntegrationSuccess	1.000	.687
Q5-ISIntegrationSuccess	1.000	.749

Extraction Method: Principal Component Analysis.

Table E.2 Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.651	58.257	58.257	11.651	58.257	58.257	8.211	41.057	41.057
2	1.632	8.162	66.419	1.632	8.162	66.419	5.072	25.362	66.419
3	.943	4.717	71.137						
4	.862	4.308	75.445						
5	.798	3.991	79.435						
6	.523	2.613	82.048						
7	.482	2.411	84.459						
8	.458	2.292	86.751						
9	.400	2.001	88.752						
10	.351	1.753	90.505						
11	.315	1.577	92.081						
12	.275	1.377	93.459						
13	.255	1.276	94.734						
14	.215	1.077	95.812						
15	.201	1.007	96.819						
16	.172	.860	97.679						
17	.143	.715	98.394						
18	.125	.624	99.018						
19	.108	.541	99.559						
20	.088	.441	100.000						

Extraction Method: Principal Component Analysis.

Table E.3 Component Matrix(a)

	Component	
	1	2
Q1aISIntegrationSuccess	.763	-.238
Q1bISIntegrationSuccess	.799	-.204
Q1cISIntegrationSuccess	.778	-.269
Q1dISIntegrationSuccess	.792	-.260
Q1eISIntegrationSuccess	.811	-.100
Q1fISIntegrationSuccess	.856	-.082
Q1gISIntegrationSuccess	.821	-.239
Q1hISIntegrationSuccess	.842	-.236
Q1iISIntegrationSuccess	.757	-.192
Q1jISIntegrationSuccess	.843	-.218
Q1kISIntegrationSuccess	.716	-.180
Q1lISIntegrationSuccess	.641	-.079
Q2aISIntegrationSuccess	.805	.244
Q2bISIntegrationSuccess	.777	.247
Q4aISIntegrationSuccess	.724	-.076
Q4bISIntegrationSuccess	.718	.280

Table E.3 Component Matrix(a) (Continued)

	Component	
	1	2
Q3aISIntegrationSuccess	.652	.523
Q3bISIntegrationSuccess	.691	.502
Q3cISIntegrationSuccess	.609	.563
Q5-ISIntegrationSuccess	.809	.308

Extraction Method: Principal Component Analysis.
(a) 2 components extracted.

Table E.4 Rotated Component Matrix(a)

	Component	
	1	2
Q1aISIntegrationSuccess	.758	.255
Q1bISIntegrationSuccess	.767	.303
Q1cISIntegrationSuccess	.788	.238
Q1dISIntegrationSuccess	.794	.253
Q1eISIntegrationSuccess	.716	.394
Q1fISIntegrationSuccess	.741	.435
Q1gISIntegrationSuccess	.805	.287
Q1hISIntegrationSuccess	.821	.302
Q1iISIntegrationSuccess	.726	.288
Q1jISIntegrationSuccess	.810	.317
Q1kISIntegrationSuccess	.686	.273
Q1lISIntegrationSuccess	.566	.311
Q2aISIntegrationSuccess	.509	.669
Q2bISIntegrationSuccess	.485	.655
Q4aISIntegrationSuccess	.631	.363
Q4bISIntegrationSuccess	.418	.648

Table E.4 Rotated Component Matrix(a) (Continued)

	Component	
	1	2
Q3aISIntegrationSuccess	.222	.806
Q3bISIntegrationSuccess	.266	.812
Q3cISIntegrationSuccess	.164	.813
Q5-ISIntegrationSuccess	.475	.723

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 3 iterations.

Table E.5 Component Transformation Matrix

Component	1	2
1	.810	.586
2	-.586	.810

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

APPENDIX F

MANOVA

Statistical results from multivariate analysis of variance to examine whether there were significant differences on the two IS success measures, IS Capability and IS Performance, based on the data collection group (paper vs. online)

Table F.1 MANOVA on IS Capability and IS Performance by Group (Paper vs. Online)

Source	*df*	*F*	Partial η^2	Power
IS Capability	1	0.20	0.00	0.07
Error	102	(1.14)		
IS Performance	1	0.00	0.00	0.05
Error	102	(1.34)		

Note. ** $p < 0.01$, Number in parenthesis represents mean square error.

Table F.2 Means and Standard Deviations on IS Capability and IS Performance by Group (Paper vs. Online)

	Group	M	SD	N
IS Capability	Paper	4.86	0.96	19
	Online	4.76	1.13	22
	Total	4.80	1.06	41
IS Performance	Paper	4.75	1.06	19
	Online	4.75	1.22	22
	Total	4.75	1.15	41

APPENDIX G

HYPOTHESES TESTING STATISTICS

Hypotheses testing results from correlation, standard multiple regression, forward stepwise regression, and moderation regressions analyses.

Table G.1 Correlations

	Q6 Perceived Success	IS Perf.	IS Capability	F1	F2	F3	F4	F5	F6	F7	F8	F9
IS Performance (DV)	.701**											
IS Capability (DV)	.638**	.751**										
Q10 Exec Mngt Support **F1**	.582**	.695**	.634**									
Q13ab Quality of Merger Planning **F2**	.615**	.736**	.667**	.766**								
Q11b Quality of Comm To IS **F3**	.467**	.754**	.580**	.666**	.576**							
Q12 Degree of IS participation in merger planning **F4**	.504**	.726**	.660**	.684**	.718**	.702**						
Q13c Quality Of IS Integration Planning **F5**	.615**	.796**	.707**	.713**	.796**	.745**	.835**					
Q11a Quality Of Comm To Users **F6**	.474**	.729**	.643**	.651**	.548**	.855**	.698**	.726**				
Q14 End User Involvement in IS integration **F7**	.443**	.604**	.678**	.496**	.560**	.619**	.599**	.592**	.605**			
Q15andQ16 Quality of Technical Support to Users **F8**	.632**	.679**	.690**	.671**	.665**	.595**	.683**	.684**	.660**	.536**		
Q18 Provisions for training due to the integration **F9**	.571**	.620**	.588**	.633**	.597**	.631**	.621**	.694**	.625**	.623**	.553**	
Q17ProvisionsEmployeeMoral e **F10**	.423**	.527**	.511**	.538**	.430**	.575**	.549**	.629**	.579**	.380**	.507**	.721**

Note. ** Correlation is significant at the 0.01 level .

Table G.2 Collinearity Statistics

Model		Tolerance
1	(Constant)	
	Q6-PerceivedSuccess (control variable)	.474
	Q10 Exec Mngt Support **F1**	.293
	Q13 Quality of Merger Planning **F2**	.230
	Q11b Qualityof Comm To IS **F3**	.217
	Q12 Degree of IS participation in merger planning **F4**	.253
	Q13c Quality Of IS Integration Planning **F5**	.160
	Q11a Quality Of Comm To Users **F6**	.216
	Q14 End User Involvement **F7**	.447
	Q15andQ16 Composite **F8**	.350
	Q18 Provisions for training due to the integration **F9**	.289
	Q17ProvisionsEmployeeMorale **F10**	.384

Table G.3 Means and Standard Deviations on Main-Effect Hypotheses Variables

Variable	*M*	*SD*
IS Capability	4.78	1.06
IS Performance	4.74	1.16
Q6 Perceived Success	5.06	1.68
Q10 Executive (Non-IS) Management Support	4.86	1.44
Q13 Composite A and B Quality of Merger Planning	4.61	1.47
Q11b Quality of Communication of Merger Activities to IS	4.30	1.29
Q12 Composite A and B Degree of IS Participation in Merger Planning	4.27	1.62
Q13c Quality Of IS Integration Planning	4.71	1.75
Q11a Quality of Communication of IS Integration Activities to User Areas	4.47	1.41
Q14 Degree of End-User Involvement in IS Integration	3.92	1.58
Q15 and Q16 Composite Quality of Technical Support to Users During IS Integration	4.65	1.19
Q18 Composite A and B Provisions for Training Due to Integration	4.09	1.35
Q17 Provisions for Addressing IS Employee Morale	4.13	1.47

Note. n = 101

Figure G.1 Multiple linear regression: testing assumption of absence of outliers.

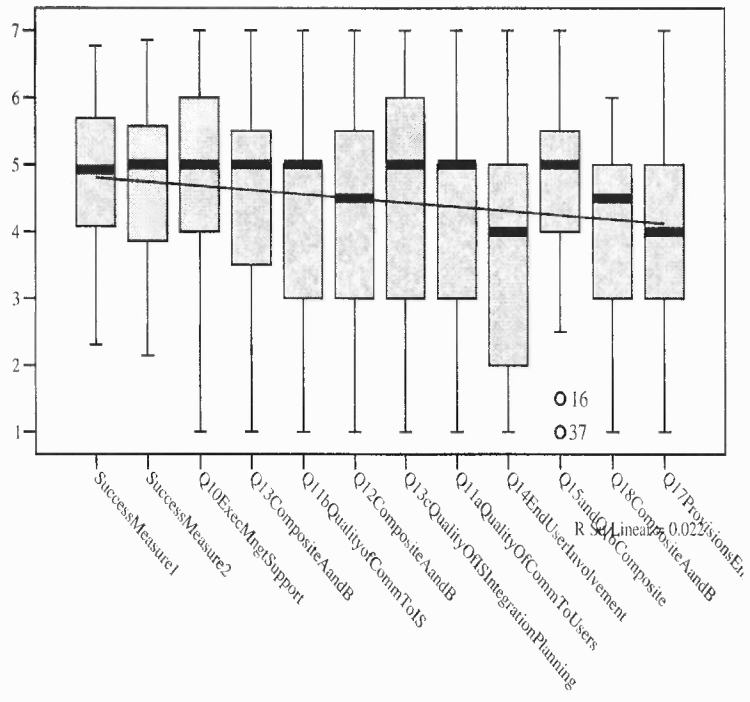


Figure G.2 Multiple linear regression on IS Capability predicted by organizational and IS factors: testing assumption of normality.

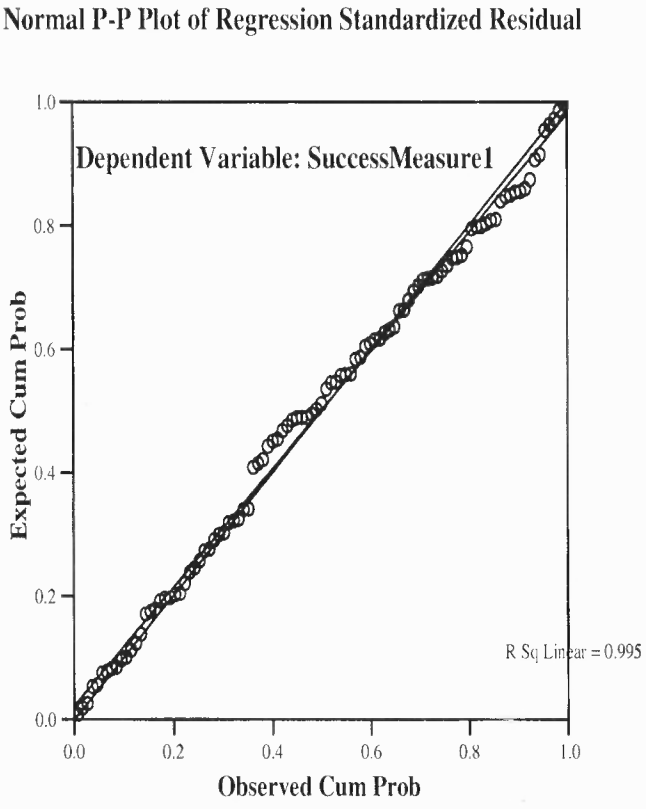


Figure G.3 Multiple linear Regression on IS Capability predicted by organizational and IS factors: testing assumption of linearity and homoscedasticity.

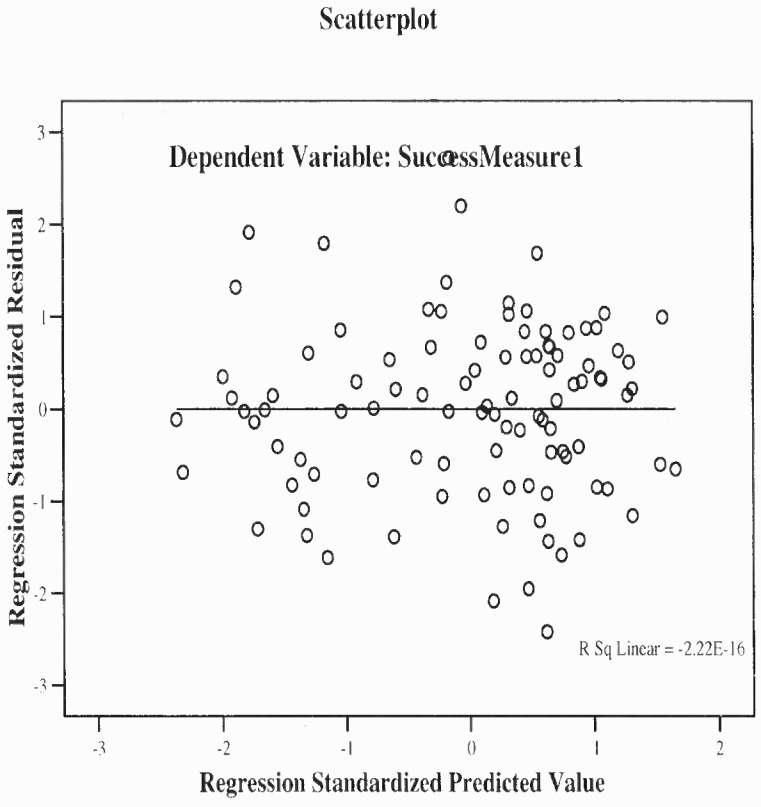


Table G.4 Multiple Linear Regression on IS Capability Predicted by Organizational and IS factors

Variable	B	SE	β
Model 1			
(Constant)	2.75	0.26	
Q6 Perceived Success	0.40	0.05	0.64**
Model 2			
(Constant)	1.66	0.28	
Q6 Perceived Success	0.14	0.05	0.22**
Q10 Executive (Non-IS) Management Support	0.06	0.08	0.08
Q13 Composite A and B Quality of Merger Planning	0.06	0.09	0.08
Q11b Quality of Communication of Merger Activities to IS	-0.19	0.10	-0.23
Q12 Composite A and B Degree of IS Participation in Merger Planning	0.02	0.08	0.03
Q13c Quality Of IS Integration Planning	0.09	0.09	0.15
Q11a Quality of Communication of IS Integration Activities to User Areas	0.15	0.09	0.21
Q14 Degree of End-User Involvement in IS Integration	0.25	0.06	0.38**
Q15 and Q16 Composite Quality of Technical Support to Users During IS Integration	0.12	0.09	0.13
Q18 Composite A and B Provisions for Training Due to Integration	-0.12	0.09	-0.16
Q17 Provisions for Addressing IS Employee Morale	0.10	0.07	0.14

Note. ** $p < 0.01$.

R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
.836	.700	.663	.61496	.292	8.660	10	89	.000

Table G.5 Multiple Linear Forward Stepwise Regression on IS Capability Predicted by Organizational and IS factors

Variable	B	SE	β
Model 1			
(Constant)	2.75	0.26	
Q6 Perceived Success	0.40	0.05	0.64**
Model 2			
(Constant)	2.15	0.23	
Q6 Perceived Success	0.27	0.05	0.42**
Q14 Degree of End-User Involvement in IS Integration	0.33	0.05	0.49**
Model 3			
(Constant)	2.02	0.22	
Q6 Perceived Success	0.18	0.05	0.28**
Q14 Degree of End-User Involvement in IS Integration	0.25	0.05	0.37**
Q13c Quality Of IS Integration Planning	0.19	0.05	0.32**
Model 4			
(Constant)	1.67	0.26	
Q6 Perceived Success	0.13	0.05	0.21**
Q14 Degree of End-User Involvement in IS Integration	0.22	0.05	0.33**
Q13c Quality Of IS Integration Planning	0.14	0.05	0.23*
Q15 and Q16 Composite Quality of Technical Support to Users During IS Integration	0.20	0.08	0.22*

Note. ** $p < 0.01$ and * $p < 0.05$.

Figure G.4 Multiple linear regression on IS Performance predicted by organizational and IS factors: testing assumption of normality.

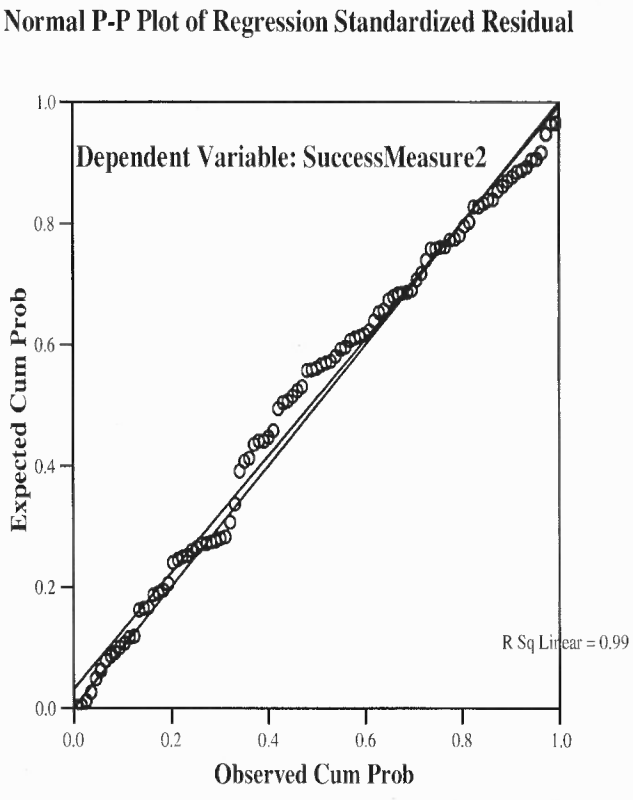


Figure G.5 Multiple linear Regression on IS Performance predicted by organizational and IS factors: testing assumption of linearity and homoscedasticity.

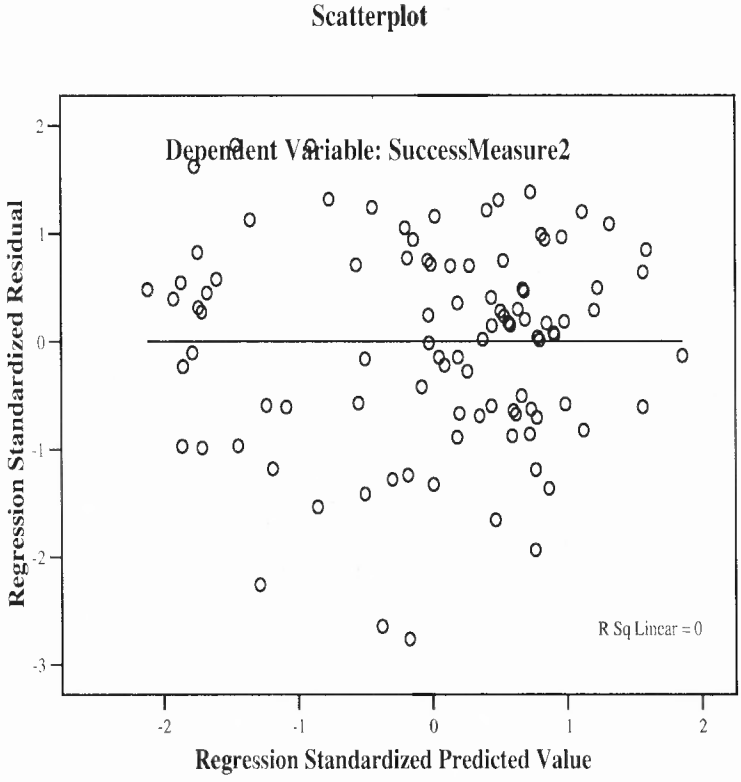


Table G.6 Multiple Linear Regression on IS Performance Predicted by Organizational and IS factors

Variable	B	SE	β
Model 1			
(Constant)	2.30	0.26	
Q6 Perceived Success	0.48	0.05	0.70**
Model 2			
(Constant)	1.03	0.26	
Q6 Perceived Success	0.22	0.05	0.31**
Q10 Executive (Non-IS) Management Support	-0.01	0.07	-0.01
Q13 Composite A and B Quality of Merger Planning	0.16	0.08	0.20
Q11b Quality of Communication of Merger Activities to IS	0.23	0.09	0.26*
Q12 Composite A and B Degree of IS Participation in Merger Planning	0.05	0.07	0.07
Q13c Quality Of IS Integration Planning	0.09	0.08	0.13
Q11a Quality of Communication of IS Integration Activities to User Areas	0.11	0.09	0.14
Q14 Degree of End-User Involvement in IS Integration	0.04	0.05	0.06
Q15 and Q16 Composite Quality of Technical Support to Users During IS Integration	-0.01	0.08	-0.01
Q18 Composite A and B Provisions for Training Due to Integration	-0.08	0.08	-0.10
Q17 Provisions for Addressing IS Employee Morale	0.02	0.06	0.02

Note. ** $p < 0.01$ and * $p < 0.05$.

R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
.886	.785	.758	.56835	.293	12.136	10	89	.000

Table G.7 Multiple Linear Forward Stepwise Regression on IS Performance Predicted by Organizational and IS factors

Variable	B	SE	β
Model 1			
(Constant)	2.30	0.26	
Q6 Perceived Success	0.48	0.05	0.70**
Model 2			
(Constant)	1.09	0.24	
Q6 Perceived Success	0.31	0.04	0.45**
Q11b Quality of Communication of Merger Activities to IS	0.49	0.05	0.55**
Model 3			
(Constant)	0.90	0.22	
Q6 Perceived Success	0.22	0.04	0.32**
Q11b Quality of Communication of Merger Activities to IS	0.39	0.05	0.44**
Q13 Composite A and B Quality of Merger Planning	0.23	0.05	0.29**

Note. ** $p < 0.01$

Table G.8 Standardized Q7 The Degree of IS Integration Moderating the Relationship between Standardized Q10 Executive (non-IS) Management Support and IS Capability, after Controlling for Standardized Q6 Perceived Merger Success

Variable	B	SE	β
Model 1			
(Constant)	4.80	0.08	
Q6 Perceived Success	0.68	0.08	0.64**
Model 2			
(Constant)	4.80	0.07	
Q6 Perceived Success	0.43	0.09	0.41**
Q10 Executive Management Support	0.43	0.09	0.40**
Model 3			
(Constant)	4.80	0.07	
Q6 Perceived Success	0.37	0.09	0.35**
Q10 Executive Management Support	0.41	0.09	0.39**
Q7 The Degree of IS Integration	0.19	0.08	0.18*
Model 4			
(Constant)	4.84	0.07	
Q6 Perceived Success	0.37	0.09	0.35**
Q10 Executive Management Support	0.39	0.09	0.36**
Q7 The Degree of IS Integration	0.20	0.08	0.19*
Q10*Q7	-0.14	0.07	-0.15*

Note. ** $p < 0.01$ and * $p < 0.05$.

APPENDIX H

PATH MODELS CREATION STATISTICS

Results from statistical analysis conducted to build the hypothesized IS Capability and IS Performance path models.

Table H.1 Multiple Linear Regression on F7 Degree of End-User Participation in IS Integration Activities, which Significantly Predicts IS Capability

Variable	B	SE	β
Model 1			
(Constant)	.20	.46	
ControlVariableQ6-PerceivedSuccess	-.02	.09	-.02
F1-Q10ExecMngtSupport	-.26	.14	-.24
F2QualityMergerPlanning	.26	.14	.24
F3Q11bQualityofCommToIS	.23	.18	.19
F4DegreeOfISParticipation	.17	.12	.17
F6Q11aQualityOfCommToUsers	.19	.16	.17
F9ProvisionsForTraining	.59	.14	.50***
F10Q17ProvisionsEmployeeMorale	-.26	.12	-.23*

Note. *** $p < 0.001$, * $p < 0.05$.

Table H.2 Multiple Linear Regression on F5 Quality of IS Integration Planning, which Significantly Predicts IS Capability

Variable	B	SE	β
Model 1			
(Constant)	-.99	.30	
ControlVariableQ6-PerceivedSuccess	.10	.06	.10
F1-Q10ExecMngtSupport	-.11	.09	-.09
F2QualityMergerPlanning	.42	.09	.35***
F3Q11bQualityofCommToIS	.21	.12	.16
F4DegreeOfISParticipation	.36	.08	.33***
F6Q11aQualityOfCommToUsers	.10	.11	.08
F9ProvisionsForTraining	.05	.09	.04
F10Q17ProvisionsEmployeeMorale	.17	.08	.15*

Note. *** $p < 0.001$, * $p < 0.05$

Table H.3 Multiple Linear Regression on F8 Quality of Technical Support to Users During Integration, which Significantly Predicts IS Capability

Variable	B	SE	β
Model 1			
(Constant)	1.26	.30	
ControlVariableQ6-PerceivedSuccess	.18	.06	.26
F1-Q10ExecMngtSupport	.09	.09	.104
F2QualityMergerPlanning	.14	.09	.170
F3Q11bQualityofCommToIS	-.15	.12	-.17
F4DegreeOfISParticipation	.17	.08	.24*
F6Q11aQualityOfCommToUsers	.28	.11	.34*
F9ProvisionsForTraining	-.067	.09	-.08
F10Q17ProvisionsEmployeeMorale	.08	.08	.10

Note. * $p < 0.05$

Table H.4 Multiple Linear Regression on F2 Quality of Merger Planning, which Significantly Predicts IS Performance

Variable	B	SE	β
Model 1			
(Constant)	.56	.33	
ControlVariableQ6-PerceivedSuccess	.06	.06	.07
F1-Q10ExecMngtSupport	.41	.08	.40***
F4DegreeOfISParticipation	.06	.09	.07
F6Q11aQualityOfCommToUsers	-.26	.09	-.25**
F9ProvisionsForTraining	.06	.10	.06
F10Q17ProvisionsEmployeeMorale	-.17	.08	-.17*
F8QualTechSupport	.14	.10	.12
F7Q14EndUserInvolvement	.11	.07	.12
F5Q13cQualityOfISIntegrationPlanning	.43	.09	.51

Note. *** $p < 0.001$, ** $p < 0.01$

Table H.5. Multiple Linear Regression on F3 Quality of Communication of Merger Activities to IS, which Significantly Predicts IS Performance

Variable	B	SE	β
Model 1			
(Constant)	.64	.28	
ControlVariableQ6-PerceivedSuccess	-.00	.05	-.01
F1-Q10ExecMngtSupport	.13	.07	.14
F4DegreeOfISParticipation	.03	.08	.04
F6Q11aQualityOfCommToUsers	.58	.07	.63***
F9ProvisionsForTraining	-.04	.09	-.04
F10Q17ProvisionsEmployeeMorale	.04	.07	.05
F8QualTechSupport	-.13	.09	-.12
F7Q14EndUserInvolvement	.08	.06	.20
F5Q13cQualityOfISIntegrationPlanning	.13	.08	.18

Note. *** $p < 0.001$

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