

The Strategic Determinants of
Information Systems and Technology in
the Success or Failure of
Mergers and Acquisitions

By

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A dissertation submitted to the Graduate Faculty in Business
In partial fulfillment of the requirements for the degree of
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Abstract

THE STRATEGIC DETERMINANTS OF INFORMATION SYSTEMS AND TECHNOLOGY IN THE SUCCESS OR FAILURE OF MERGERS AND ACQUISITIONS

By

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Advisor: Harry Rosen, Ph.D.,

Mergers and acquisitions (M&A) are considered as a strategic tool often used at the corporate level. However, there are many studies indicating that the success rate of M&A's is less than 50 percent. This dissertation uses resource-based theory (RBT) to analyze the success rate of M&As. I derive three possible strategic objectives from the RBT: increase efficiency, increase sales, and the introduction of new products. Using these three objectives, plus other commonly stated none-RBT objectives, this dissertation examines the role of information systems / information technology (IS/T) in an M&A environment.

The results support the hypothesis that IS/T resources are used to align the strategic objectives of the M&A. Speed of integration in M&A can affect the performance of M&A if the objective is for the firm to introduce new products. One may infer that for the companies surveyed in this study, IS/T are often applied as a tactical tool, but not a strategic resources.

For my family, Chen-wu Chu, Shu-Hwa Chu,
Meng-chun Chen, and little Kuanghua Diana Chu

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I like to recognize my fellow students that are pursuing the same goal, especially Leslie Bobb and Irene He. Their insights and constructive criticisms shortened my journey.

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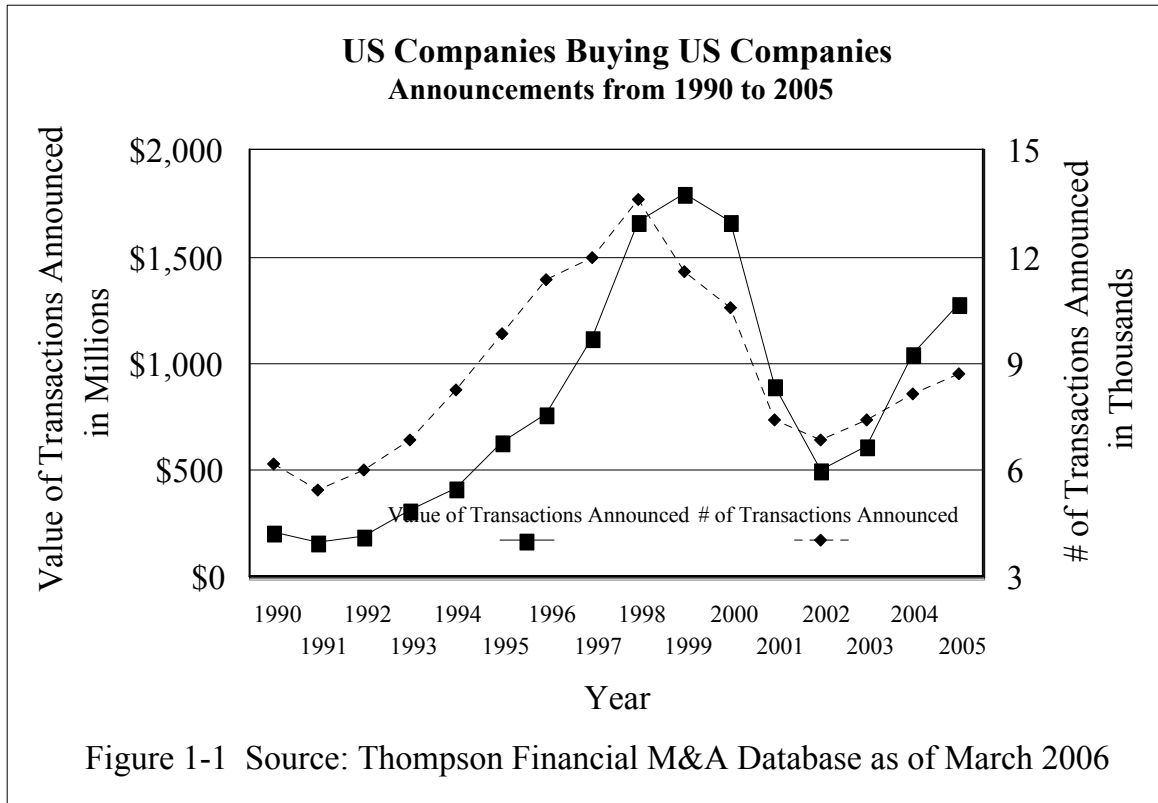
Chapter 1 Introduction

During the 1990s, the business environment in the United States (U.S.) became hyper-competitive. Academic researchers and business practitioners have identified many factors that they believe drove this hyper-competitiveness. For this study, two factors are considered to have had the greatest influence in creating this environment:

1. Many companies used mergers and acquisitions (M&A) as a method to achieve their strategic objectives.
2. There was a growing reliance on information systems and information technology (IS/T) or management information systems (MIS) to create more efficient and effective ways of performing routine business operations.

The 1990s boom in the economy led to a sharp increase in M&A activities. In the United States, the number of announced M&As increased from 6,193 transactions in 1990 until it peaked in 1998 with 13,614 transactions. The dollar value of M&As increased from \$209.7 billion in 1990 to its peak at \$1,802.3 billion in 1999 (Figure 1-1). In 2005, the value of the announced transactions were returning to the late 1990s era but the number of transactions did not increase as quickly, suggesting that the value of the deals are much larger than before.

In addition to the rise in M&A activity during the 1990s, businesses in the United States increased their spending and investment on IS/T. Academic as well as trade publications have reported that IS/T were instrumental in increasing productivity and reducing response time to change in the environment during the 1990s (Irani, 2002; Kudyba, Vitaliano, 2003; Tyson, 2002). Even with the recession economy of 2001, investments in IS/T were still 40 to 70 percent higher than in 1995 (Mandel, 2002).



Furthermore, spending on IS/T is expected to increase in the foreseeable future. Even as the economy remained slow during 2001-2002, IS/T executives in the U.S. expected to increase their spending and investments in IS/T by 3.9 percent (Weinberg, 2001). Senior executives believe that the surest way to increase profit is to boost productivity through IS/T investments. The positive experience with IS/T investments in the 1990s provides executives with confidence that IS/T will boost productivity and create the competitive advantage that they need.

Section 1.1 Problem Description

Since M&As significantly affected the business environment in the 1990s, they have become a topic of great interest for practitioners and scholars in the strategic management and finance/economic schools. Many researchers have devoted themselves to studying the purpose, motives, and impact of M&As.

While there is a large body of research on organizational strategy based on the industry analysis framework proposed by Michael Porter (1985), this study will focus on the resource-based theory (RBT) (Barney, 1991; Grant, 1991) because it is better suited to the analysis of an M&A. Instead of stressing industry conditions, RBT stresses the exploitation of firm-specific resources and capabilities to generate superior organizational performance (Barney, 1991; Wernerfelt, 1995). Many studies in strategic management used RBT to examine M&A events (Anand and DeLios, 2002; Krishnan *et al.*, 2004; Schilling and Steensma, 2002).

However, even with all this attention, academic literature offers little advice on how to ensure success, how to avoid failures, or how to turn a failed M&A into a successful one. These are important questions since various studies indicate that more than fifty percent of M&As during the 1990s were failures (Henry and Jespersen, 2002; Lajoux, 1998; Pritchett and Robinson, 1997). From 1997 to 2002, investors lost billions of dollars in failed M&A transactions: AOL/TW, Cisco, and even GE are examples. Although the failure of WorldCom, Tyco International, Enron, and Cendant are attributed to accounting irregularities, accounting deceptions were not the only source of under-performance in Conesco, Mattel, WebMD Corp., Cisco Systems, Charles Schwab & Co., DaimlerChrysler, or AT&T. These companies struggled because they were not able to deliver the M&A results they projected (Lee, 2002).

While IS/T projects have risks, one can argue that they are not likely to overshadow the problems resulting from a failed M&A. If an IS/T project fails, the organization can revert to its previous rules and procedures. Such projects are worth the risk because it is likely that effective use of IS/T will provide some competitive

advantage. IS/T delivers such advantages by providing opportunities for top management to ask better questions about their business, assisting in making better and more informed decisions on how to position the company, and in setting strategic direction. For example, FedEx initially used IS/T to create a package tracking system to pinpoint bottlenecks and improve efficiency in its operations (Brewin and Rosencrance, 2001). Once the system was in place and tracking procedures became routine, the same IS/T created the opportunity for the senior executive team to differentiate the FedEx brand by allowing customers to interface with the internal system, and customers began to feel that FedEx cared more about their packages than FedEx's competitors (Brewin and Rosencrance, 2001; Crockett, 1989). Similarly, Buck-Lew *et al.* (1992) reported that Fleet Norstar strategically used their IS/T to smooth their acquisitions. The original intention of Fleet Norstar for IS/T was to reduce cost through more efficient operation. However, once the integration effort of IS/T operations became centralized and routine, the process allowed Fleet Norstar to engage in more acquisitions.

From the strategic management school, resource-based theory (RBT) has provided a theoretical framework to investigate how firms can obtain or sustain competitive advantages in the economy. Analysis of M&A using RBT has generated ambiguous results (Lubatkin, 1987; Singh and Montgomery, 1987). There may be a need to refine the basic model of analysis using RBT by assessing the mechanism that creates value for the firm. The use of RBT allows one to explore specific resources such as IS/T within M&As, something that has received scant attention from researchers. This study intends to utilize rigorous investigation techniques to supplement the existing body of research.

One of the problems cited in existing research on M&A studies is that there are differences in how M&A performance is measured. The financial/economic school has relied on two types of indicators, stock prices and various financial ratios (such as return on investment, return on capital, or Tobin's q). Strategic management school sometimes uses executives' opinions on how well the M&A was performing. There is, however, evidence suggesting that there is a gap between how one views the performance of an M&A and how it actually performs (KPMG 1999; KPMG 2001). Since attribution theory from psychology may be used to explain the differences between perception and reality, it will be employed in this study.

Section 1.2 Research Question

Since an M&A transaction can drastically influence the operations and performance of an organization, the main research question for this dissertation will focus on the strategic determinants of M&A success or failure: what factors or conditions influence the success or failure of an M&A transaction? While this question has been extensively studied in the past, results are sometimes ambiguous and contradictory. Furthermore, since the failures occurred after the completion of M&A, this study will focus on the integration phase of M&A - the phase where failure becomes apparent.

This dissertation attempts to reduce ambiguity by asking an additional question: How can IS/T be used to increase the success rate of M&A? The effort will concentrate on the use of IS/T during an M&A transaction. The specific questions are: How can IS/T affect the outcome of an M&A? What role does IS/T have in M&A? What are the best practices of IS/T in M&A? In summary, how can IS/T be used to help an organization to obtain competitive advantages during the integration phase of an M&A?

Section 1.3 Contribution

The successful completion of this dissertation will make several contributions.

1. This study intends to fill a gap in the current research by examining the role of IS/T during an M&A transaction, using the RBT perspective.
2. This study will test various claims made in practitioner publications and in several empirical qualitative studies. While the experiences of practitioners and qualitative studies are important in understanding a situation such as M&A, their claims and propositions must be tested empirically.
3. The results from this study will generate a checklist for managers based on empirical findings. While there are already many recommended checklists suggested by practitioners (Armour, 2002; Christianson, 2000; Ciotti and Griffith, 1998; KPMG, 1999; KPMG 2001; Melymuika, 2000; Radcliff and LaPlante., 1999;), they often lack empirical supports because these recommendations and suggestions are often built from anecdotal experience. This study will provide managers involved with M&A activities a new checklist that is derived from more rigorous analysis of secondary and empirical data.

Section 1.4 Organization of this Paper

This dissertation is organized as follows: Chapter 1 is the introduction to the problem. Chapter 2 will provide the theoretical perspectives from prior research studies in M&A and IS/T. Then, Chapter 3 will develop the model with a description of independent, intervening, and dependent variables, present various hypotheses, describe the survey instrument, and discuss the data gathering methodology. Chapter 4 will

present the empirical data analysis and a discussion of the data analysis. Finally, Chapter 5 will have concluding remarks, and addresses limitations in this study while suggesting future research direction. In order to facilitate the readers' understanding of the terminology used, the appendix will have a glossary that includes the working definitions of commonly used terms in this dissertation.

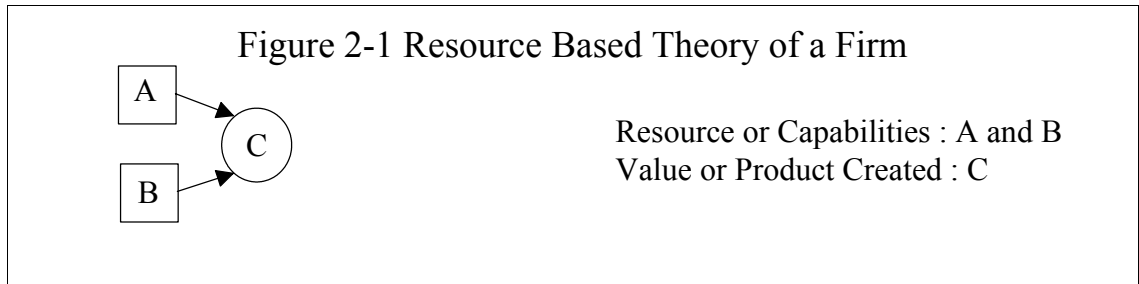
Chapter 2 Literature Review

The literature review begins with an examination of resource-based theory (RBT) and its implication for mergers and acquisitions (M&A). It is followed by a review of M&A studies from the strategic management school. Since the performance of M&As is usually measured by using financial indicators, the M&A studies from the financial/economic school are reviewed. The studies that examine the relationship between information systems/information technologies (IS/T) and M&As are reviewed next. Finally, since there are M&A studies that report on the differences between the financial performance and the perceived performance by the management, the attribution theory from psychology is reviewed to assist in the understanding of the performance gap.

Section 2.1 Overview of RBT

This paper analyzes the use of resources and capabilities during an M&A from the perspective of the RBT (Barney, 1991; Dierickx and Cool, 1989). Haspeslagh and Jemison (1991) argue that a resource (or capabilities) based perspective aids in the understanding of the integration process and its interdependence with the specific resources of the acquirer and target. The focus is on the dynamic of post-acquisition management. Thus, this study departs from the dominant agency-based theoretical framework employed by economists analyzing M&As.

The RBT of the firm posits that firms can be conceptualized as a collection of resources and capabilities that create values in the society (see Figure 2-1). The value of the firm is determined by some estimate of the future earnings that the firm can create. For example, assume the firm has only two resources or capabilities, A and B to produce



product C, as Figure 2-1 indicates. The value of the firm is estimated by the value of C.

How the firm uses the resources A and B to achieve competitive advantage is of great interest to strategic management researchers.

The RBT further posits that firms compete on the basis of “unique” corporate resources that are valuable, rare, difficult to imitate, and non-substitutable by other resources (Barney, 1991; Conner, 1991; Schulze, 1994). The RBT operates under the assumptions that the resources needed to conceive, choose, and implement strategies are heterogeneously distributed across firms in the economy, and that these company differences remain stable over time (Barney, 1991).

One can argue that the resources obtained from M&As are valuable, rare, difficult to imitate, and non-substitutable by other resources. Since each firm can be viewed as a unique entity, each firm must have some unique resources or capabilities. Additionally, when one firm is being acquired by another, the transaction will create a set of decisions that can occur only once on this collection of resources, because an independent firm can be acquired only once. Further, the process of integrating the resources during the union of two firms is unique for two reasons. First, two distinct acquirers will apply two different sets of actions on the same resource, even if their ultimate intentions are the same. This is due to the varying set of resources each acquirer has, and the competitive advantage that the acquirer enjoys. Second, since the target can be said to be a unique

entity in the society, the specific target would be difficult to imitate and may not be substituted for another target.

Within the RBT, many scholars have conceptualized different types of resources and capabilities. Grant (1991) provides a classification of resources into tangible, intangible, and personnel-based resources. Tangible resources include the financial capital and the physical assets of the firm, such as plant, equipment, and stocks of raw materials. Intangible resources encompass assets such as reputation, brand image, and patents, while personnel-based resources include technical know-how and other knowledge assets, including dimensions such as organizational culture, employee training, and loyalty. While resources serve as the basic units of analyses, firms create competitive advantage by assembling resources that work together to create organizational capabilities (Grant, 1991). Capabilities refer to an organization's ability to assemble, integrate, and deploy valued resources in combination (Amit and Schoemaker, 1993; Russo and Fouts, 1997; Schendel, 1994). Capabilities subsume the notion of organizational competencies (Prahalad and Hamel, 1990) and are rooted in processes and business routines. Grant (1995) described a hierarchy of organizational capabilities, where specialized capabilities are integrated into broader functional capabilities, such as marketing, manufacturing, and IS/T capabilities. Functional capabilities, in turn, integrate to form cross-functional capabilities, such as new product development capability, customer support capability, etc. For example, a firm's customer support capability may derive from the cross-functional integration of its marketing, IS/T, and operations capabilities.

Causal Ambiguity	Competing firms may be unable to imitate another firm's resources and capabilities because they do not understand how these resources are related to competitive advantage
Lead-Time	A set of factors that determine the amount of time from project launch until competitors have a substantive response in place
Path Dependency	Describes choices made during the early stages of project planning and implementation that have significant implications on current choices, decisions, and expected outcomes
Role of History	Refers to unique historical conditions that allow a company to either acquire or develop resources at a low cost. New competitors that do not have these resources will have to pay a higher price in order to have them
Socially complex links	Social factors which are beyond the ability of firms to control and influence in a systematic fashion, causing a firm's resources to be difficult to imitate
Time compression diseconomies	Refers to resources which are relatively easy or inexpensive to imitate, but the process is time-consuming

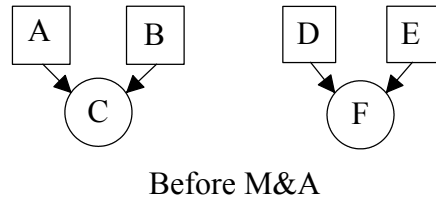
While there are researchers who need to make a distinction between resources and capabilities, this study will define resources broadly, to include assets, knowledge, capabilities, and organizational processes. Further discussion will use the terms resources and capabilities interchangeably to refer to the stock of factors as well as a firm's ability to utilize these factors. This is possible due to the characteristics of M&A activities explained earlier. RBT assumes that resources are heterogeneous and to some extent immobile. Because the development of capabilities depends on available resources, resource and capability heterogeneity explains firm performance. The potential value of resources and capabilities is reinforced by sustainability factors. RBT asserts that these factors will allow companies to sustain a competitive advantage that competitors will find hard to duplicate. For a definition of sustainability factors, see

Table 2-1 (Barney, 1991, 1997; Bharadwaj, 2000; Collis and Montgomery, 1995; Feeny and Ives, 1990; Mata *et al.*, 1995; Peteraf, 1993; Wernerfelt, 1984).

Section 2.2 Strategic Management School

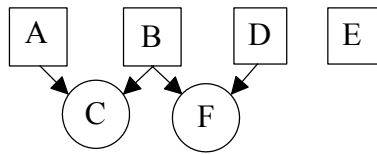
For the strategic management researchers, RBT offers three basic scenarios in which M&A would make sense (see Figure 2-2). In the first scenario, the union of the two firms allows the new firm to create the same set of products that were produced prior to the union with fewer resources; in this case, resource E is not needed for the creation of products C and F. Such resources may be physical assets which can be reduced via sale of the assets, or in the case of employees, via head count reduction. In this scenario, the M&A makes sense because resources A, B, and D are utilized more efficiently. For the second scenario, the union of the two firms allows the new firm to create some new products or services that the firm was not able to offer prior to the M&A, in this case, product G. This will create a new stream of revenue and create more value for the combined firm. In this scenario, resources A, B, D, and E are not expected to be eliminated from the newly integrated firm. Again, the M&A makes sense because the resources are more effectively or efficiently used. The third scenario is similar to the second scenario in that reduction in resources is not expected, however, the union of the two firms does not create new products or services. The union will, however, allow the firm to generate more sales of the existing products and services. The M&A makes sense because available resources are more productive after the M&A. The acquirer is not limited to just one of the above scenarios to justify the M&A; the acquirer often applies some combination of these three scenarios during the announcement of the M&A.

Figure 2-2
RBT - Value Creation in M&A



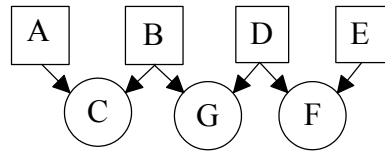
A, B, C is one firm and
D, E, F is another firm
A, B, D, and E are resources
and capabilities that produced C
and F

After M&A



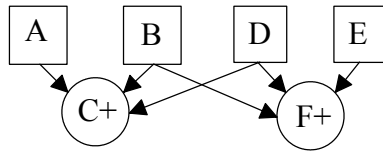
Efficiency Increase

Resource E eliminated.
Products C and F are produced by one firm



New Products Increase

Products C and F are produced by one
firm. Additionally, a new product G
can now be produced.



Sales Increase

Products C and F are produced by one
firm with more sales generated from
products C and F (C+ and F+)

SECTION 2.2.1 VARIABLES OF INTEREST FOR STRATEGIC MANAGEMENT RESEARCHERS

The researchers in the strategic management school focus their investigation on the following variables: M&A type, M&A experience, M&A attribute, M&A integration planning, relative size, speed of integration, and strategic objectives. Each of these variables has, in varying degrees, demonstrated that it can have an impact on the overall performance of an M&A.

Types of M&As

The researchers in the strategic management school place much emphasis on the type of M&A. Strategic management researchers rely on secondary data to determine the M&A type (Anand and Singh, 1997; Capron *et al.*, 1988; Chatterjee, 1986; Kitching, 1967). Through the use of secondary data, one determines the primary motive of the M&A. Generally, there are three distinct categories of M&As: horizontal, vertical, and all others. Although some researchers would argue that horizontal M&As occur only when two competitors combine, many researchers accept that the M&A is horizontal if the acquirer and target operate within the same industry (Anand and Singh, 1997; Capron *et al.*, 1988; Chatterjee, 1986; Kitching, 1967). Vertical M&As are defined by the two firms having an upstream/downstream relationship, or some kind of supplier/customer relationship.

The major difference in the “all other category” depends on how the scholars examine the M&A. Gaughan (1996) has three general classifications of M&A: horizontal, vertical, and, where it cannot be defined as either horizontal or vertical, conglomerate. The classification developed by Pennings *et al.* (1994) uses standard industry classification (SIC) code to distinguish four general types of M&As: horizontal,

Table 2-2 Examples of M&A Type using SIC Pennings <i>et al.</i> (1994)		
Acquirer (SIC - Description)	Target (SIC - Description)	M&A Type
Aspen Group Resources Corp. (1311 - Crude petroleum and natural gas)	Endeavour Resources Inc. (1311 - Crude petroleum and natural gas)	Horizontal
NBTY Inc. (2834 - Pharmaceutical preparations)	Global Health Sciences Inc. (2833 - Medicinal chemicals and botanical products)	Horizontal
Navajo Southern Inc. (2911 - Petroleum refining)	Rio Grande Pipeline Co. (4612 / 4613 / 1321 - Crude petroleum pipelines / Refined petroleum pipelines / Natural gas liquid)	Vertical
MarkWest Energy Partners LP (1311 - Crude petroleum and natural gas)	Shell Pipeline Co. LP - Michigan (4612 - Crude petroleum pipelines)	Vertical
Patterson Energy Inc. (1381 - Drilling oil and gas wells)	Jones Drilling Corp. (1311 - Crude petroleum and natural gas)	Related
Circuit Research Laboratories (3663 - Radio, TV broadcasting, and communications equipment)	Orbit Inc. (3651 - Household audio and video equipment)	Related
Pangea Petroleum Corp. (1311 - Crude petroleum and natural gas)	Segway II Corp. (6799 - Investor group)	Unrelated
Altrimega Health Corp. (2834 - Pharmaceutical preparations)	Creative Holdings Inc. (6798 / 6719 - Real estate investment trust/offices of holding companies)	Unrelated

vertical, related, and unrelated (see Table 2-2 for examples). For these authors, a horizontal M&A occurs when the SIC code between two firms is equivalent to the third digit with the core business. They would categorize an M&A as a vertical M&A when the SIC code between the two firms is not equivalent at the two digit level but can be determined to take place within a firm's value-added chain. A related M&A describes a

merger where the SIC code between the two firms is equivalent at the two digit level with the core business. Finally, a merger is classified as unrelated when none of the previous three SIC code criteria apply. Kitching (1967) has five general categories of M&As: horizontal, vertical integration, concentric marketing, concentric technology, and conglomerate. For Kitching, concentric marketing describes the acquisition of a target firm that has the same customer base as the acquiring company, but uses a different technology. Concentric technology describes a target which uses the same technology used by the acquiring company but serves a different set of customers. Finally, a conglomerate M&A describes a merger where the target has a different customer base and a different technology from the acquiring company.

Analysis of the empirical data by researchers using M&A type have produced ambiguous or contradictory results. For example, in a study with 203 target firms, Singh and Montgomery (1987) reported higher abnormal returns for related targets. In another study, with 218 cases, Shelton (1988) reached a similar conclusion where a related acquisition showed significantly higher return. Similarly, from analyzing 60 M&As, Flanagan (1996) reached the conclusion that related acquisitions perform better in the stock market than unrelated acquisitions. Anand and Singh (1997) examined 289 cases and determined that related M&As tend to perform better than unrelated M&As. Similarly, a study conducted by Brush (1996), with all acquisitions in 356 industries between 1980 and 1986, suggested that an acquisition in which some resource can be shared tends to perform better. However, a study conducted by Lubatkin (1987) with 340 cases suggested that a related acquisition does not perform better than an unrelated acquisition. Additionally, Chatterjee (1986) studied 158 cases and concluded that

unrelated M&As perform better than related M&As. A study conducted by Kitching (1967) with 69 M&As found that unrelated M&As tend to perform better than related M&As. Overall, there is no empirical consensus on the expected returns from acquisitions. One reason for the lack of consensus stems from the need to understand more about the role of acquisitions in obtaining new resources.

M&A Experience

M&A experience is defined as how many M&As the firm has completed in the past. This analysis did not receive much attention until recently, when researchers began to address the question of whether firms learned any useful lessons from prior acquisitions (Beckman and Haunschild, 2002; Haleblian and Finkelstein, 1999; Haywood, 2002). M&A experience is a difficult variable to examine due to changes in analysis technique. Until the late 1990s, most studies on M&A performance used event study where the researchers examined the effects of the M&A announcement on the company's stock price over a period of time. While event study can be used to explain many other factors that can contribute to the success or failure of an M&A, it is difficult to incorporate experience into event study analysis. Event study will be elaborated on in Section 2.3.

Beckman and Haunschild (2002) attempted to incorporate the M&A experience using the event analysis by focusing on each acquisition separately. They found that firms in networks with heterogeneous partner experience pay lower premiums than those in networks with homogeneous partner experience. Haywood (2002) analyzed whether or not there is a difference in the acquirer's performance based on the type of acquisition that acquirer made in the past. He supplemented the event analysis with security

analysts' opinions on the acquisitions and found conditions that allow the acquirer to learn from its previous M&As. The research so far has only focused on how the current M&A is affected by one other past M&A. The overall performance of serial acquirers, such as General Electric, Cisco, or Johnson & Johnson, is not adequately explained by the proposed theories on organizational learning. Further investigation of this variable may assist in the understanding of M&A performance.

M&A Attribute

M&A attribute is defined as the level of cooperation between the target and acquirer. Pritchett and Robinson (1997) stated that the order of increased resistance from the target firm is rescue, collaboration, contested situation, and raid. M&A attribute is associated with two types of risk. One type of risk is associated with the skill set of the target firm. M&As classified as rescue tend to fail because of either lack of needed skills or resources from the target, or lack of attention or time from the acquirer. The acquiring firm should provide extensive leadership and resources to ensure the success of a rescue M&A. Studies have found that rescue acquisition often results in a drop in shareholder wealth (Banerjee and Owers, 1992; Niden, 1993). However, Bruton *et al.* (1994) found that performance improved for the acquirer of financially distressed firms when industry relatedness was included in the analysis.

The other type of risk is associated with the level of resistance. The raid M&A has high risk because of the high level of resistance from the target firm. Excessive resistance often leads to M&A failure because those who are responsible for running the daily operations in the target firm are less motivated to do their jobs; hence, the performance of the M&A can suffer. Boisi and Essig (1994) found that firms engaging

in hostile takeover, or raid, increase the risk of becoming a hostile takeover target. Boisi and Essig (1994) suggested that this is often the result of the excess premium the acquiring firm has to pay and the defensive action taken by the target firm. Pritchett and Robinson (1997) theorized that the collaboration and contested M&A have moderate risk simply due to the nature of an M&A.

M&A Integration Planning

M&A integration planning is defined as the existence of a written M&A integration plan, or the existence of a management team dedicated to the integration of an M&A. Evidence suggests that 80 percent of failed M&As can be attributed, at least partly, to a lack of integration plan (Schuler and Jackson, 2001). The existence of a written M&A integration plan serves at least three purposes. One, it allows the acquirer to have a baseline to compare with the progress of its objectives and to determine whether or not more resources need to be devoted to the integration effort. Two, it can be used as a vehicle of communication to all employees on what to expect at every stage of the integration effort (Appelbaum and Gandell, 2003). Three, in the process of creating the integration plan, it will force the acquirer to plan for potential problems and reduce potential disruptions that may occur during the integration (Buono, 1997).

Similar to the existence of an integration plan, the existence of an integration team can often lead to the reduction of failure rate (Epstein, 2004). There are at least two advantages to having a dedicated integration team. The first advantage is that someone within the organization will monitor the progress of integration closely, even if the integration plan does not exist. The integration team should be able to identify problematic situations and move quickly to keep the integration effort moving toward

completion. Second, when there is no integration team, no one can be held accountable for the success or failure of the M&A. When a problem arises, it can always be dismissed as “someone else’s problem.” When no one is accountable to fix a problem, the problem will remain, and the integration effort can be delayed indefinitely.

While the existence of an integration plan or integration team can help to reduce the chance of failure, there is anecdotal evidence that excessively detailed integration plans or an overly large integration team can cause an M&A to fail. Again, the existence of an integration plan or integration team does not guarantee success in an M&A.

Relative Size

Many researchers (Harrison *et al.*, 1991; Kitching, 1967; Kusewitt, 1985) have argued that relative size is particularly crucial because both excessively small and excessively large relative sizes of target to acquirer are associated with poorer performance. Similar to M&A attribute, the relative size between the target and the acquirer can create two different types of pitfalls for the acquirer (Kitching, 1967). The first type of pitfall occurs when the revenue from the target is less than two percent of the revenue from the acquirer (Kitching, 1967). There are two types of risk that can occur for small target M&As. One kind of risk occurs when the senior executive team from the acquirer may lose interest in the target because the target company is too small. In this case, the target would not be able to receive enough attention from the senior management of the acquirer, and minor problems due to lack of resources will not get resolved until the problem becomes significant enough to affect the overall performance of the acquirer. The other kind of risk occurs when the target senior executive team may not be able to “think like big businessmen.” In this case, there will be problems

communicating the needs of the acquirer or the target, and issues may not be resolved until one side takes the time to understand the other side's position.

The second type of pitfall occurs when the target is equal to or larger than the acquirer. Increased risk is associated with these larger transactions. When the size of the acquisition is small, a small error in planning will not affect the overall performance of the acquirer. However, when the size of the target is significant compared with the acquirer, a minor issue may affect the overall performance of the acquirer for two reasons. First, since the target is much larger, mistakes will have more effect on the value of the acquirer. A ten percent drop in sales from a target that is only five percent of the total sales can be a rounding error. A ten percent drop in sales from a target that is 50 percent of the total sales will cause a corresponding five percent drop for the entire firm. Second, when organizational conflict arises, and if the employees from the target are able to drag out the conflict for an extended period of time, it can cause an overall drop in performance of the firm because the target accounts for a significant portion of the performance.

There is ambiguous empirical evidence on the impact of size on M&A performance. Beckman and Haunschild (2002) found no effect from the relative size on profitability. Bergh (1997) found relative size had an ambiguous result on two different samples, where one sample indicated a positive outcome for divestiture of the acquired unit and another showed a negative outcome for divestiture of the acquired unit. Ramaswamy and Waegelein (2003) found a statistically significant association between post-M&A performance and differences in the relative size of the combining firms. Hayward (2002) found that relative size contributed to the amount of time needed for

organizations to learn from the current M&A. While researchers have argued that relative size can contribute to the overall success or failure of an M&A (Kitching, 1967), a few studies use relative size only as a control variable because of the ambiguous results and the problems associated with very large or very small acquisitions (Capron, *et al.*, 2001; Capron and Pistre, 2002; Krishnan *et al.*, 1997).

There are several ways to define relative size between the target and acquirer, such as: revenue (Lee and Caves, 1998; Seth, *et al.*, 2002.), market equity (DeLong, 2001), and market capitalization in relation to the purchase price (Akhigbe, *et al.*, 2000; Hayward, 2002; Hayward, 2003). This study will adopt Hayward's (2002, 2003) method of determining the relative size: the market capitalization of the acquirer at the time of acquisition announcement in relation to the final value paid for the acquisition. The market capitalization and the purchasing price are used because these numbers are readily available from secondary sources, and should be non-biased.

Speed of Integration

A few researchers believe that the speed of integration for an M&A can contribute significantly to the overall success of an M&A (Feldman and Spratt, 1999). The speed of the integration throughout the entire M&A process is important. The acquirer should move forward swiftly, the key positions should be filled quickly, and a merger timetable should be outlined. These actions will minimize the culture clash that could result and increase employees' overall adjustment while decreasing the chances of M&A failure (Appelbaum and Gandell, 2003). Feldman and Spratt (1999) have argued that the slower the integration effort, the longer the delay for the newly combined firm to experience the benefit of the M&A. Since the acquirer paid a premium for this set of

resources, if these resources cannot provide the needed performance because of problems in integration, the overall performance of the firm will be affected. Epstein (2004) argued that speed is essential to a successful M&A integration, while fear and indecisiveness can often be obstacles to rapid action. Early completion of integration projects can both mitigate risks and permit an earlier realization of merger benefits. Companies often set an integration program that includes a stretch goal for speed of implementation. Lucent Technologies Inc., for example, formulated an integration program that aimed for completion within 100 days. Epstein (2004) further argued that companies face a number of threats if the companies move slowly in the integration process. The threats are mainly from two key stakeholders: employees and customers. Employees may regard the slow pace as a sign of uncertainty, and may pursue opportunities at rival firms where the situation seems more stable. Customers may likewise fear instability, and seek competitors' products if the visible aspects of the integration are not achieved rapidly.

The importance of speed to the success of post-merger integration is often underestimated. There is a significant correlation between the speed of integration and merger success (Epstein, 2004). However, Meyer and Lieb-Doczy (2003) argued that speed of integration has an inverse relationship with the quality of integration, and advise against a speedy integration. Appelbaum and Gandell (2003) have found that sometimes it is impossible to move the integration forward because some issues are beyond the control of those who are responsible for the integration effort. Similar to other variables of interest to the strategic management researchers, empirical evidence does not always follow theoretical arguments.

Capron and Pistre (2002)	Cording (2004)	Feldman and Spratt (1999)
To achieve economies of scale in manufacturing	Acquire one or more brands	Access to Additional Management Talent
To achieve other economies of scale	Avoid a takeover of the acquirer	Access to Additional Technical Talent
To reduce overcapacity in the industry	Consolidation of similar units	Access to Distribution Channels
To diversify your financial risk	Cross-selling	Access to New Brands
To turn around a failing firm	Defend the acquirer's market position	Access to New Markets
To prevent a competitor from acquiring the target	Diversify the acquirer's financial risk	Access to New Products
	Expansion into new customer	Access to New Technologies
	Expansion into new geographic market segments	Access to Manufacturing Capacity
	Market share growth	Access to Manufacturing Know-how
	Prevent a competitor from acquiring the target	Access to Suppliers
	Reduce industry capacity	Enhanced Reputation
	Transfer of know-how from the acquirer to the target	Entry to New Industry
	Transfer of know-how from the target to the acquirer	Growth in Market Share
	Turnaround a failing target	Redirection of Operating Expenses
		Reduction in Number of Competitors
		Reduction in Distribution Costs
		Reduction in Manufacturing Costs

Strategic Objectives

Other strategic management researchers believe that classifications of M&As, such as relatedness or unrelatedness, are not sensitive enough to provide the determination of success or failure of an M&A (Capron and Pistre 2002; Cording, 2004; Feldman and Spratt, 1999). Their research uses a collection of M&A objectives that are frequently stated during an M&A announcement (see Table 2-3). Use of specific M&A objectives will be adapted for this study. Since this review did not reveal analysis of specific objectives using the three scenarios described by RBT, this study will contribute

to the understanding of M&As in the strategic management school from the RBT perspective by offering a set of strategic objectives relating to the three cases described above.

SECTION 2.2.2 MEASURING PERFORMANCE

While there is significant progress in M&A research from the strategic management school, there are still some unresolved issues relating to how one measures the performance of an M&A. There are three techniques to measure the performance of an M&A: top executive team's perception, changes in stock price, and financial ratio comparison.

The problem with using top executive team's perception of an M&A stems from the differences between managers' responses and public response. Top executive team's perception is derived from the managers' responses to survey questions such as: Would you rate this M&A as a success or failure? The public's response to an M&A is reflected in the stock price of the company. The KPMG (2001) study highlighted the perceptual differences, as KPMG found only 30 percent of the companies surveyed actually create value for the stockholders. However, 75 percent of the respondents in the survey believed their M&A performed well. This would suggest that the responses from the managers are often biased towards a positive performance.

Section 2.3 Finance/Economic School

The finance/economic school uses techniques based on stock prices and financial ratio comparisons to measure the performance of M&As. The similarity between these two techniques is in the assumption and the fundamental theories used to explain M&As.

Researchers in this area are usually from the fields of economics or finance where theories of capital market are extensively applied. The general research questions on M&As in this school are: Do M&As create value? If M&As create value, who will benefit from the value creation? As such, the level of analysis in this school can be considered as the entire economy (Birkinshaw, *et al.*, 2000). Researchers in this area extensively apply the theories of efficient market, capital asset pricing model, and agency theory.

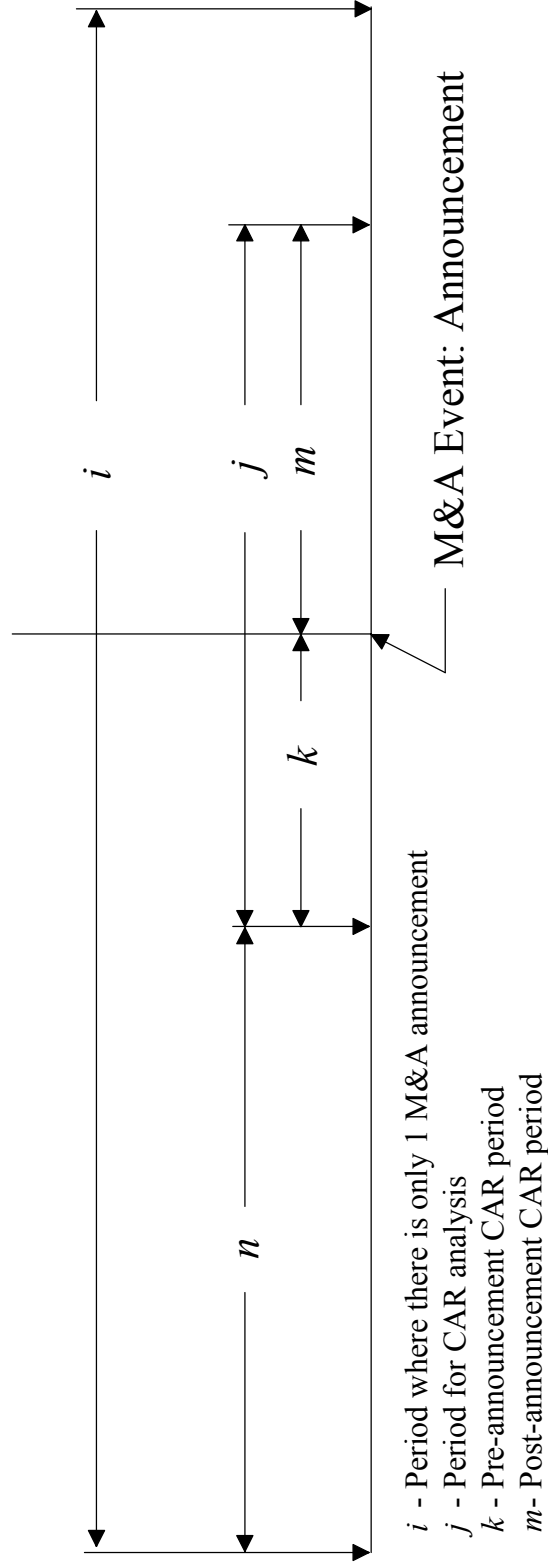
As mentioned earlier, there are two groups of researchers within this school, based on the type of data they use for analysis. One group relies on the behavior of stock prices; the other relies on the financial ratios derived from reports filed with government agencies. Since the data for both research styles are available from secondary sources, researchers usually do not need to contact the business executives directly.

Many researchers in this school rely on event analysis, or the behavior of stock prices, to determine the success or failure of an M&A. They can specify up to four time frames to determine α , β , and abnormal return (See Figure 2-3): the number of days before and after the announcement of an M&A must be specified and the actual abnormal return due to the M&A event must be calculated, and the number of days prior and post announcement of the M&A must be specified (Cybo-Ottone and Murgia, 2000; Capron and Pistre, 2002).

There are three major difficulties in using event analysis for this study. First, prior event studies in M&As focus on the M&A announcement event. While there is emerging evidence showing that *ex ante* analysis of stock prices is correlated with *ex post* measurement of M&A performance (Finkelstein and Halebian, 2002), what this event

Figure 2-3

Time Frame for Event Analysis



Total period (*i*) can be from 50 to 250 days. Alpha and beta are computed during the period *n*. Cumulative Abnormal Return (CAR) is calculated and analyzed during the *j* period. If information leakage is an important variable in the study, then *k* will not be zero. There may be several period *m*(*s*) in a study, but the sum of *k* and *m* periods cannot be more than period *j*.

analysis offers is a prediction because the actual integration has not yet occurred. As this study intends to predict the success or failure of an M&A with a set of factors, the measurement of success or failure should not be a prediction. Secondly, while it is possible to focus the event on the post-M&A period, there is the issue of selecting when to start the analysis and how long one should analyze the data. Starting the analysis on the effective or completion date of an M&A makes logical sense. However, the period needed to determine the performance of the combined firm has to be short to prevent other events that can move the stock from entering into the analysis. Since integration efforts can easily last more than three months, the probability of other events entering into the event analysis becomes a major concern for the validity of analysis. Third, current techniques used in event analysis do not allow for the incorporation of multiple M&As, which has been identified as an influential factor in the study of M&As. As explained earlier, event analysis needs a period of time where no other stock-moving event, such as another M&A, occurs. When the sample includes serial acquirers, locating a long “clean” period where no M&As occur is often not possible.

The other researchers in the financial management school recognize the above limitation for event studies. While they still believe in the efficient market hypothesis, capital asset pricing model, agency theory, free cash flow, and market for corporate control, this group prefers to use data in financial reports to judge the performance of M&As. These studies often use financial ratios to determine the success or failure of an M&A transaction, such as return on invested capital, return on equity, revenues, profits, Tobin’s q , or other numbers found in financial reports (Piloff and Santomero, 1998).

If one decides to use the financial ratios to measure the performance of an M&A, one must recognize that until 2001, there were two ways to acquire another company, pooling-of-interest and purchase. Financial Accounting Standards Board (FASB) announced their 141 and 142 statements to eliminate pooling-of-interest and allow goodwill to stay on the balance sheet until it is impaired.

If one uses financial ratios to determine the performance of an M&A, one should recognize that prior to 2001, a sizable portion of the deals, 10% to 20%, used pooling of interest to record the acquisition (Sikora, 1999). In the purchase method, a more conservative method, one takes all the assets off the balance sheet of the target and transfers them onto the balance sheet of the acquirer at fair market value. Then the acquirer takes the cash, stocks, or debts that were paid to the shareholders off the target's balance sheet. The difference between the purchase price and the market value of the target asset is recorded as goodwill on the acquirer's balance sheet. Since the goodwill should be amortized for a maximum of 40 years, for the next forty years, the acquirer's net-income will be reduced and will reduce the earnings-per-shares (EPS).

If one uses pooling-of-interest to record acquisition, however, line items from the target is transferred to the acquirer at book-value. This is because the merger must be completed using stock transfer. Under pooling-of-interest, goodwill from the target may be written off and can result in an artificially high EPS, and may positively bias companies using pooling-of-interest as the main way to record their acquisitions.

However, since FASB has issued its 141 and 142 statements in 2001, pooling of interest is no longer allowed in the U.S. M&A announced after 2001 must be record using the purchase technique. Since the new rule allows companies not to take a charge

to depreciate its goodwill, the profitability ratio, return on invested capital (ROIC) is considered as an unbiased indicator of a firm's performance. Hence, Financial ratio comparison will be adopted as a research technique for this study.

Section 2.4 Studies of IS/T and M&As

This review reveals a consistent lack of research studies on M&As using IS/T as a reference point. Prior to 1990, only one research study on IS/T and M&As appeared in a peer-reviewed journal. Since 1990, seven additional research studies on IS/T and M&As have been published in peer-reviewed journals. After an examination of the results of these eight studies (see Table 2-4 for a brief summary), RBT-related studies in the IS/T field are discussed. This section ends with a discussion of how the performance of IS/T is measured.

SECTION 2.4.1 EXISTING STUDIES

There are three major conclusions one can deduce from these eight studies:

1. Participation of IS/T executives in M&A planning is important,
2. An IS/T audit is important to the success of IS/T integration, and
3. IS/T integration is affected by organizational structure and characteristics.

The most apparent suggestions from these eight studies is that the participation of IS/T executives in M&A planning should be important. Participation of senior IS/T executives can assist in the elimination of potential problems during post-acquisition integration (Main and Short, 1989; Sumi and Tsuruoka, 2002), and can lead to a successful IS/T integration (Buck-Lew *et al.*, 1992; McKiernan and Merali, 1995;

Stylianou *et al.*, 1996). The earlier the IS/T professional gets involved in the M&A, these researchers argue, the smoother the integration effort will be.

Second, an audit of the IS/T, or doing due diligence on IS/T resources, is recommended by every study. Researchers indicate that the more complete and comprehensive the audit, the more likely that the integration will be a success. If the audit is complete and comprehensive, then the integration process will be smooth.

The third general conclusion from this review is that the level of IS/T integration is affected by the organization's characteristics and structure (Giacomazzi *et al.*, 1997). The more centralized or common operations the new company will have, the higher the level of IS/T integration will be needed. This conclusion is well supported by the empirical evidence; it is a well-observed phenomenon within the Management Information Systems (MIS) field.

The main interest of these studies, however, is the performance of IS/T itself, not the performance of M&A. Except for three studies (Main and Short, 1989; Weber and Pliskin, 1996; Sumi and Tsuruoka, 2002), the rest of the studies focused on how IS/T is affected in an M&A setting. Moreover, although the M&A analyzed by Main and Short (1989) was acknowledged as a success, Main and Short (1989) did not specify how the performance of the M&A was measured. Weber and Pliskin (1996) used managerial self-assessment to judge the performance of M&As, but they were not able to find significant contributions from IS/T. Sumi and Tsuruoka (2002) used cost and speed of integration to determine the success of a single case. McKiernan and Merali (1995) reported the descriptive statistics of their survey, but they offered no theoretical implications. The opportunities for IS/T to add value in an M&A have not been fully

Table 2-4 Research Studies of IS/T and M&As						
Studies in Chronological order	Research Type	Research Question	Research Method (Sample Size)	Measure of M&A Performance	Result/Conclusion	
Main & Short, (1989)	Process	What steps did IS/T executives take in the Baxter merger?	Case Study (1)	Transaction was a success	Creditable planning process, intensive communication, and good management of resource were identified as contributing to the success of IS/T integration	
Buck-Lew, Wardle, Pliskin, (1992)	Org. Behavior	Is strategic fit or organizational fit enough to predict success of an M&A?	Case Study (5)	Not measured	The examined case demonstrated IS/T can have a positive impact on the operation or process of an M&A.	
McKiernan & Merali, (1995)	Org. Behavior	What should be IS/T's role in post-acquisition?	Case Study (2) / Survey (16)	Not measured	IS/T is not a significant part of the initial planning process, and is often not integrated immediately.	
Weber & Pliskin, (1996)	Org. Behavior	What is the relationship between the IS/T integration and the organizational culture within an M&A transaction?	Survey (73)	Merger effectiveness based on self assessment of 12 questions.	Evidence shown that culture, but not IS/T integration, has significant influence on the effectiveness of an M&A	
Stylianou, Jeffries, Robbins, (1996)	Org. Behavior	What can influence IS/T integration success during an M&A activity?	Survey (44)	Not measured	Merger management has a major impact on the success of IS/T integration.	
Giacomazzi, Panella, Pernici, Sansoni, (1997)	Strategic / Org. Behavior	What is the appropriate IS/T integration strategy in an M&A?	Survey (38)	Not measured	The proposed decision model for IS/T integration matched well with actual transaction.	
Robbins & Stylianou, (1999)	Org. Behavior	How does a successful IS/T integration contribute to better organizational performance?	Survey (44)	Not measured	High level of IS/T interaction can lead to successful IS/T integration	
Sumi & Tsuruoka, (2002)	Process	What steps in the integration of IS/T can help M&A integration?	Case Study (1)	Cost and speed of integration	Early IS/T audit and the option to upgrade IS/T system can help to smooth the integration effort	

explored, except through case analysis and theoretical framework (Main and Short, 1989; Buck-Lew *et al.*, 1992; Sumi and Tsuruoka, 2002). This dissertation hopes to provide some empirical evidence to improve the understanding of the relationship between IS/T and M&A.

SECTION 2.4.2 RBT AND IS/T

The RBT of the firm dominates strategic management literature and is also used in IS/T literature (Priem and Butler, 2001). For example, RBT has been used to examine IS/T resource performance discrepancies (Teng, Cheon, and Grover, 1995), to provide support for the strategic-grid framework (Raghunathan and Raghunathan, 1990), and to link IS/T capability and firm performance (Bharadwaj, 2000). RBT is important to understand in terms of strategic IS/T alignment because it provides an understanding of how to uncover IS/T-based opportunities and produce superior strategies.

IS/T resources and capabilities can include hardware, software, communications, IS/T applications, and IS/T personnel. These IS/T resources, however, are hardly unique and inimitable. Over the past few years, IS/T has become widely available to most firms. The practice of competing via proprietary systems is replaced with using open systems, because open systems have gained wide acceptance and offer more advantages over legacy systems. Strategic IS/T applications provided distinct benefits to firms like American Airlines and Federal Express. However, over a period of time, their competitors developed similar systems. Most IS/T applications are prone to imitation. A firm which has gained any temporary advantage through IS/T can quickly lose this advantage if a competitor chooses to perform reverse engineering, or hire any of the individuals involved with the advantaged firm's IS/T application, or duplicate it through

various other means (Mata *et al.*, 1995). Hence, IS/T resources, such as hardware, software, applications, and personnel, are neither unique nor inimitable.

Mata *et al.* (1995) listed five attributes of IS/T resources, namely: 1) customer switching costs, 2) access to capital, 3) proprietary technology, 4) technical IS/T skills, and 5) managerial IS/T skills. The authors concluded that “managerial IS/T skills” are the only attribute that could provide any sustainable advantage from IS/T. They further argued that IS/T management skills, which are often distributed heterogeneously across firms, could serve as a source of distinct advantage. This proposition is reinforced by Bharadwaj’s (2000) findings that firms with high IS/T capability tend to outperform other firms on a variety of profit and cost-based performance measures. In other words, although IS/T resources are neither unique nor inimitable in their own right, a firm can generate superior performance with a mix of IS/T resources and complementary business and human resources.

IS/T researchers have investigated IS/T as a resource and found it must interact with other resources to obtain competitive advantage (Meta *et al.*, 1995). This review was not able to locate studies that address the question of: Can the use of IS/T in the process of implementing strategic objectives provide competitive advantage? The present study will investigate this question within the setting of M&A, with IS/T having the role of intervening variable.

SECTION 2.4.3 PERFORMANCE OF IS/T

Another important question that will be investigated in this study is: Is there any correlation between the performance of M&A and the performance of IS/T? Existing studies of M&As and IS/T have avoided asking this question. As stated earlier, M&A

studies from the IS/T field are mostly interested in the performance of IS/T, not how M&As perform or how the overall firm performs.

Within the IS/T literature, alignment between corporate strategic objectives and IS/T contribution is an important indicator of the overall performance of the firm. Alignment has been defined by Reich and Benbasat (1996) as “the degree to which the IS/T mission, objectives, and plans support and are supported by the business mission, objectives, and plans.” For this study, the alignment process will be focused on how IS/T supports business objectives and plans. The support of business missions, objectives, and plans on IS/T missions, objectives, and plans has little impact on the overall performance of the firm or the M&A activity.

Alignment between business strategy and IT strategy has been given significant attention in recent years and has been ranked among the top ten issues facing IT executives (Brancheau *et al.*, 1996). Most authors suggest that IT alignment with business strategy has advantages for firms. However, in practice, many firms struggle to achieve alignment (Baets, 1992; Reich and Benbasat, 1996). Kearns and Lederer (2003) have found that alignment between the IT plan and the business plan is significantly related to the use of IT for competitive advantage. Chan *et al.* (1997) found a positive relationship between IT alignment and firm performance in large companies, while Cragg and Hussin (2002) found a similar relationship between IT alignment and firm performance in small companies.

There are many ways to measure the performance of IS/T in the IS/T literature. This study will adopt the instrument developed by Doll and Torkzadeh (1988) on the performance of IS/T, where the focus is on user satisfaction. Doll and Torkzadeh’s

Table 2-5 IS/T User Satisfaction Scale (Doll and Torkzadeh, 1988)		
Category	Item	Question
Content	C1	Does the system provide the precise information you need?
	C2	Does the information content meet your needs?
	C3	Does the system provide reports that seem to be just about exactly what you need?
	C4	Does the system provide sufficient information?
	C5	Do you find the output relevant?
Accuracy	A1	Is the system accurate?
	A2	Are you satisfied with the accuracy of the system?
	A3	Do you feel the output is reliable?
	A4	Do you find the system dependable?
Format	F1	Do you think the output is presented in a useful format?
	F2	Is the output information clear?
	F3	Are you happy with the layout of the output?
	F4	Is the output easy to understand?
Ease of Use	E1	Is the system user friendly?
	E2	Is the system easy to use?
	E3	Is the system efficient?
Timeliness	T1	Do you get the information you need in time?
	T2	Does the system provide up-to-date information?

(1988) instrument consists of 12 questions, which are used to measure five dimensions of user satisfaction: Satisfaction with content (4 items), accuracy (2 items), format (2 items), timeliness of information (2 items), and satisfaction with the system's ease of use (2 items) (see Table 2-5 for complete item description). This instrument has been used in various studies (Gelderman, 1998; McHaney *et al.*, 2002) and the internal consistency of these items is reported with a Cronbach alpha of more than 0.90 with a correlation of more than 0.79 from all studies.

Section 2.5 Attribution Theory

As stated earlier, there is a perception gap between the insider and outsider on the performance of M&As (KPMG, 2001). Since this study intends to find the relationship between the performance of IS/T and M&As, there may exist a perception gap between

how one views the performance of IS/T and how one views the performance of M&A. One may need to use attribution theory to explain the relationship between IS/T and M&As because there is a potentially negative bias result toward the use of IS/T.

Studies in attribution theory have uncovered many different biases (Fiske and Taylor, 1991). Among the most common biases, and the one with perhaps the greatest applicability to strategy, is the hedonic or fundamental attribution bias. Psychological research has found consistent evidence that individuals exhibit a bias toward attributing success at tasks to internal factors, such as their own ability, and failure to external factors, such as an unfavorable environmental condition (Weiner *et al.*, 1972). Central to these findings is the assertion that people practice “defensive attributions,” trying to cognitively distance themselves from the causes of failure that would threaten their self-image or reputation (Heider, 1958; Snyder *et al.*, 1976). A second explanation offered for this perception bias is informational. In short, it may be that successful individuals develop cognitive structures that attribute success to themselves and, thus, assume failure is due to external sources (Ross, 1977). This bias seems quite robust and has even been identified in attributions made by groups (Hewstone, 1989).

While the initial evidence about cognitive biases originated in social psychology lab studies, this same pattern of biased attribution for success and failure has been found by management researchers in studies examining the attributions top managers make when explaining their firm’s successes and failures in reports to shareholders (e.g., Bettman and Weitz, 1983; Staw *et al.*, 1983). As such, top managers do not seem immune to such cognitive biases.

Using the above arguments, attribution theory would suggest that senior executives can negatively bias the IS/T for two reasons. First, if the senior executives do not fully understand their IS/T capability, then they may view IS/T as something external, beyond their control, and unstable, therefore, they can attribute the failure of their M&A to IS/T. Second, even if the senior executives have sufficient knowledge of their IS/T capability, they may not attribute the success of their M&A to IS/T because the senior executives may attribute the success to their own ability, which is internal, within their control, and stable.

Section 2.6 Summary of Review

The examination of the existing body of knowledge suggests that RBT can be a good theoretical lens through which to examine corporate strategic objectives, such as M&As. Within the M&A literature, factors such as type of M&A, M&A experience, M&A attribute, M&A integration planning, relative size between the firms, speed of integration, and strategic objectives are identified as influential variables that can impact the overall performance of M&As.

Techniques to measure the performance of M&As are discussed next. Because of the long integration process, event analysis was suggested as unsuitable for this study. Arguments were made to use financial ratios from company reports to judge the performance of M&As.

The search for M&A studies showed that there are only eight studies on M&As from the perspective of IS/T research, suggesting that the application of IS/T within M&As has not been fully examined by researchers. Since IS/T is a common resource for many companies, the role of IS/T within the M&A will be explored in this study. In

addition to the role of IS/T in a firm, the IS/T performance within the M&A environment will be incorporated into the analysis.

The review revealed that there is a potential problem in linking the role of IS/T to the overall performance of M&As. This study will use attribution theory to test if there is a perceptual problem between IS/T performance and M&A performance.

Chapter 3 Research Methodology

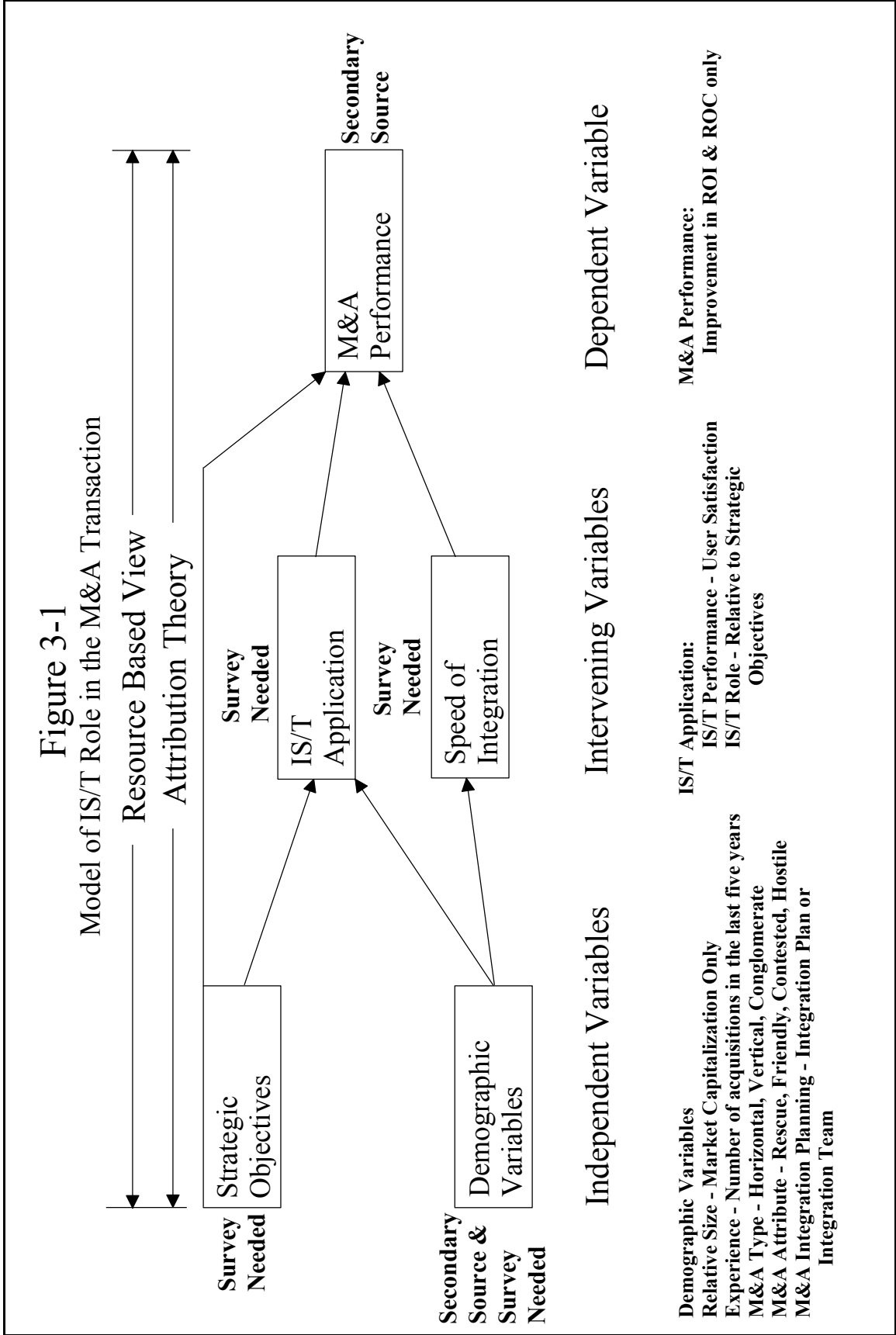
This chapter begins by developing a model using the variables described in Chapter 2 to predict the performance of an M&A transaction. Using the proposed model, hypotheses are introduced to describe the relationship among the variables. Then, the data collection procedure is briefly described. Lastly, the analysis procedure is outlined.

Section 3.1 Model Description

Figure 3-1 presents the model that guides this study. Most of the variables, such as relative size, experience, strategic objectives, etc., that can affect the performance of M&A discussed in Chapter 2 will be incorporated in this model. One can determine the type of M&A, the level of M&A experience, M&A attribute, existence of M&A integration planning, relative size between the firms, and strategic objectives before the M&A integration process begins. These variables will not change during the integration process; they are considered as independent variables. Since only strategic objectives are used to test the RBT framework discussed in Chapter 2, all other independent variables will be grouped under the factor “demographic variables.”

Two variables, IS/T application and speed of integration, are the intervening variables. There are two factors within IS/T application: the role of IS/T and IS/T performance. The role of IS/T and performance of IS/T are intervening variables because how IS/T is used occurs during the integration phase of an M&A. Similarly, the speed of integration of an M&A is not known until the integration process is completed.

The focus of this study is M&A performance. To measure the performance of an M&A, this model will use the financial ratio of return on capital derived from firm



reports to the government agencies. As the M&A performance reflects the end result of the M&A, it is the dependent variable.

Section 3.2 Hypotheses

This section describes the various assumptions that are made in the proposed model and the expectation of how the various factors affect each other. The discussion will start with the relationship of the independent variables with the intervening variables and the dependent variable. It will be followed with an analysis of how the intervening variables influence the dependent variable.

SECTION 3.2.1 INDEPENDENT VARIABLES

The description of the model begins with an examination of the independent variables and their relationship with the intervening variables and the dependent variable. As Figure 3-1 suggests, the independent variables investigated in this study are: strategic objectives and various demographic variables of M&As.

Strategic Objectives

There will be four types of strategic objectives in this model. Most of the strategic objectives listed in Table 2-3 can be classified as one of the three scenarios suggested by RBT: increase efficiency, increase new products, or increase sales. There are, however, several objectives that do not fit into any of the three scenarios suggested by RBT. For example, reduction in number of competitors or transfer of know-how from the acquirer to the target do not fit into any of the three cases. Further, a few strategic objectives make sense for more than one scenario; for instance, access to new markets may mean for new products or for existing products. It becomes necessary to construct a

set of objectives that actually tests the individual scenarios as well as allowing for frequently stated objectives that are not suggested by the RBT. Hence, there are four types of strategic objectives: objectives that relate to the elimination of resources, objectives that relate to the creation of new products or services, objectives that relate to the potential increase in sales from existing products or services, and other objectives that are not suggested by the RBT which will be called Non-RBT objectives (Table 3-1).

Scenario	Related Strategic Objectives
Case 1 - Increase Efficiency	<ul style="list-style-type: none"> • Access to supplier • Gaining market power • Opportunity to achieve higher economy of scale • Reduction in the number of employees • Reduction of duplicate and/or non-core operations • Turn around a failing target
Case 2 - New Products	<ul style="list-style-type: none"> • Allow entry into new industry • Create new services for the combined firm • Leverage skills/patents through integrating product development • Opportunity to achieve higher economy of scope
Case 3 - More Sales	<ul style="list-style-type: none"> • Access to distributor • Expand customer base to new market segment • Enhance product line • Market share growth in existing market segment • Opportunity to cross-sell products
Case 4 - Non RBT Objectives	<ul style="list-style-type: none"> • Diversify financial risk • Opportunity to buy asset at a low price • Prevent competitor from acquiring target • Reduce industry capacity

If a firm intends to achieve certain objectives, then the firm is expected to use its resources to reach such objectives. How important an objective is can be determined by the priority level given by the company. In an M&A, if a firm intends to become successful through increased efficiency, then objectives related to increased efficiency will have a higher priority. If a firm intends to become successful through increased

efficiency, then it is expected that IS/T will be used to achieve even higher efficiency. A similar argument can be made for increasing sales, introducing new products, and other non-RBT objectives. This leads to the first set of hypotheses that relate the strategic objectives to the role of IS/T.

- H1a The priority for efficiency improvement for an M&A will be positively associated with the contribution of IS/T on efficiency.
- H1b The priority for sales growth for an M&A will be positively associated with the contribution of IS/T on sales growth.
- H1c The priority for new products for an M&A will be positively associated with the contribution of IS/T on new products.
- H1d The priority for non-RBT objectives will be positively associated with the contribution of IS/T on these non-RBT objectives.

Although there are four types of strategic objectives, only three were suggested by the RBT. From the theoretical lens of RBT, the fourth type, non-RBT objective, should not add value to the firm. Moreover, since the acquirer paid a premium over the market price for the target, any additional resources diverted to the completion of these strategic objectives that do not add value to the firm are expected to cause under-performance for the firm. This leads to the next hypothesis that relates the strategic objectives to the performance of the firm.

- H2 The priority for non-RBT objectives will be negatively associated with the performance of the M&A.

Demographic Variables

While the demographic variables need to be controlled, it is likely that these variables can have an impact on the role of IS/T and the performance of an M&A. The demographic variables included in this study are: M&A type, M&A experience, M&A attribute, M&A integration planning, and relative size. This study will attempt to

confirm or disprove various claims made about these demographic variables on the performance of an M&A.

However, not all demographic variables may have an impact on the intervening variables. The demographic variables that can impact the role of IS/T are: M&A experience, M&A integration planning, and relative size. The demographic variables that can impact the speed of integration are: M&A experience and M&A integration planning.

If an M&A integration planning process exists, it would imply that the acquirer has an idea of how the combined firm is expected to work together. Since IS/T is a resource that can be used throughout the entire firm, the use and the contribution of IS/T during the integration process would increase. Similarly, the existence of an integration team would increase the contribution from IS/T because the integration team would use all available resources to integrate the two firms. If a formal integration plan exists and a management team is assigned to the integration process, the use of available resources would increase. This leads to the next hypothesis.

H3 The existence of M&A integration planning activity will be positively associated with the contribution of IS/T.

The existence of an M&A integration plan can help the M&A integration managers to focus on tasks that are essential to the success of the M&A. Additionally, identifying the steps needed to complete the M&A may reduce the amount of time these integration managers need to reflect on whether or not the process is completed. Further, the integration plan would allow the firm to monitor the progress of integration and provide additional resources if necessary. This leads to the next hypothesis.

- H4 The existence of M&A integration planning activity will be positively associated with the speed of integration.

The existing body of evidence is inconclusive on how the relative size of the acquirer versus the target can contribute to the overall performance of the M&A. However, if the acquirer is much larger than the target, then the acquirer may have more resources in its IS/T department. The acquirer IS/T department will then have the ability to provide more assistance and contributions to the overall integration effort of the M&A. This leads to the next hypothesis.

- H5 The relative size of the acquirer and target will be positively associated with the contribution of IS/T in an M&A.

The attribution theory suggests that causes for success are often internalized, and causes for failure are often externalized. If the prior M&A of a firm is a success, the managers or staff will internalize the success to their ability. If the prior M&A of a firm is a failure, the managers or staff will externalize the failure to something that they have little understanding of. If the acquirer has prior experience with M&As, then some of the decision-making procedures may be internalized by the managers or staff assigned to the integration of the M&A. Therefore, the contribution of IS/T will be de-emphasized. This leads to the next hypothesis.

- H6 The M&A experience of the acquirer will be negatively associated with the contribution of IS/T in an M&A.

If the acquirer has prior experience with M&As, then potential problems during the integration process would be known to the senior executives or the integration managers. If the acquirer expects and plans for these problems, then these potential problems may not occur at all. Fewer problems during the integration would suggest a

faster integration completion time because less time is used to resolve unexpected events. This leads to the next hypothesis.

- H7 The M&A experience of the acquirer will be positively associated with the speed of integration.

SECTION 3.2.2 INTERVENING VARIABLES

If the use of IS/T is aligned with the objectives of the M&A, then the IS/T would be used effectively in the eyes of senior executives. For this study, alignment between M&A objectives and IS/T is measured by the difference between the priority of strategic objectives and the IS/T contribution to those objectives. The smaller the absolute difference between the priority of the strategic objective and the IS/T contribution to the objective is, the higher the alignment. A high IS/T alignment with the M&A objectives would imply that the senior executives are happy with the IS/T design; the IS/T would meet their needs on accuracy, timeliness, report formats, or any other special needs they may have. This would allow IS/T to achieve higher user satisfaction, which leads to the following hypothesis.

- H8 The alignment of the role of IS/T with the firm's strategic objectives will be positively associated with the performance of IS/T.

The relationship between the role of IS/T to strategic objectives and the overall performance of the M&A can be argued as follows: If the role of IS/T is in alignment with the strategic objectives of the M&A, it is more likely that these strategic objectives will be realized because the firm's resources are being effectively used. If the acquirer is able to achieve all of its stated objectives, then the performance of the M&A should be considered a success. This leads to the next hypothesis.

- H9 The alignment of the role of IS/T and the strategic objectives will be positively associated with the performance of the M&A.

The speed of integration may impact the overall performance. Prior studies suggest that faster integration may not be possible for all M&As. However, it is possible to determine the speed of M&A completion by asking senior executives the status of completion. As argued earlier, early completion of integration projects can both mitigate risk and permit an earlier realization of merger benefits. This leads to the next hypothesis.

- H10 The speed of integration will be positively associated with the M&A performance.

The IS/T literature focuses much of its attention on the performance of IS/T and has limited discussion on the overall performance of the firm as related to IS/T. However, it is possible that these two measures are related. One can argue that if the users of IS/T are satisfied, it implies that IS/T is contributing to the overall performance of the firm. In this case, if the users of IS/T are satisfied with its contribution to the M&A, it should imply that the M&A is performing well. This leads to the next hypothesis.

- H11 The IS/T performance will be positively associated with the M&A performance.

SECTION 3.2.3 DEPENDENT VARIABLE

For this study, the only dependent variable is the performance of the M&A. There are at least three ways to measure the performance of the M&A: senior executives' opinion of M&A performance collected via survey instrument, changes in stock price collected via Center for Research in Securities Pricing (CRSP), or changes in financial performance collected via COMPUSTAT. The opinion of the senior executives is

Table 3-2 Financial Ratios Measuring Corporate Performance		
Ratio Name	Equation	Comment
Return on Asset (ROA)	Net Income / Total Asset	Measures how much profit a company earns for every dollar of its assets
Return on Equity (ROE)	Net Income / Shareholder's Equity	Measures how effectively a company's management uses investors' money
Return on Invested Capital (ROIC)	Net Operating Income / (Shareholder's Equity + Long Term Debt)	Measures how good of an investment a company is by determining how well a company's management is able to allocate capital into its operations

expected to be biased towards better performance (KPMG, 2001). Measuring the changes in the stock prices due to the progress of M&A integration may be contaminated by other corporate activity such as announcement of strategic partnership or changes in senior executive teams.

The changes in financial performance remain the best choice for determining the performance of M&A. There are various financial ratios that measure corporate profitability, return on asset (ROA), return on equity (ROE), and return on invested capital (ROIC) (see Table 3-2 for how to compute these ratios).

If ROE is used as the performance measure, then there exists the possibility that the measure will be positively biased for a portion of the acquirer. When companies takes on more debts, the ROE tends to improve because more money is available to take on more business opportunities such as an acquisition. When a firm engages in more business opportunities, it's overall income will increase. However, if the total equity is the same for two firms, the ROE measure may be different because the two companies may have different levels of long-term debts. Since some acquirers may decide to use debts to finance their acquisitions while other may use cash to purchase the target, ROE

will not be able to distinguish between the type of acquisition. Hence, ROE is not a good measure of M&A performance.

Using ROA to measure performance has similar problems as ROE, except that it is in the opposite direction. That is, while ROE tends to bias the performance positively, because debts are not considered in the calculations, ROA tends to bias the performance negatively. While ROA takes into consideration of the financial risks for the company by including all of the debts in the computation of profitability, certain debts are more important than others in determining the efficiency and effectiveness of a firm.

Short-term debts tend to be more expensive because short-term debts usually have a higher interest rate than the long-term debts. The higher interest rate of the short-term debts would mean that the short-term debts tend to fluctuate in both the amount of short-term debts and the interest payment paid as a result of holding on these short-term debts. Long-term debts are used by the company to finance capital intensive projects. The total amount of long-term debt is more stable than the short-term debts with a lower interest payment. These capital intensive projects should help the firm to make more profits. However, since ROA includes all of the debts, it can negatively affect the overall performance because of the higher interest payment and the volatility from the short-term debts.

Of these three ratios, Selden and Colvin (2003) argue that ROIC is best suited for M&A studies because ROIC measures how well a firm will do with additional capital. If the ROIC increases from the prior reporting period, it would suggest that the firm is more efficient in managing their capital than the prior reporting period. If the ROIC decreases from the prior reporting period, it would suggest that the firm is less efficient in

managing their capital than the prior reporting period. Hence, the performance of an M&A may be determined by taking the difference between the ROIC prior to the acquisition and the ROIC after the completion of acquisition.

Various researchers (Huang and Kleiner, 2004; Lynch and Lind, 2002) suggest that a quick integration is essential to the success of an M&A. The idea is that the faster the two firms integrate, the quicker the acquirer will be able to receive the benefits of the acquisition. These researchers suggest that most integration activities, especially those that can generate the largest benefits, be completed in the first one hundred days after the acquisition is completed. This would suggest that one must wait at least two quarters before making a determination as to whether or not the ROIC of the acquirer has returned to the level prior to the acquisition.

Section 3.3 Data Collection

In this section, what data is collected and how the data collection is conducted will be discussed. The discussion starts with the description of secondary data sources. It is followed by a description of the survey instrument construct. Then the procedure and criteria of the data sample will be detailed.

SECTION 3.3.1 SECONDARY DATA SOURCES

Secondary data sources for this study will be retrieved from Center for Research in Securities Pricing (CRSP), COMPUSTAT, and SDC Thompson Financial Database. These secondary data sources are used to determine the experience of the acquirer and the relative size between the target and acquirer. CRSP and COMPUSTAT are used to look up market capitalization and determine ROIC. SDC Thompson Financial Database

is used to locate M&A transaction and related details, such as announcement date, effective date, purchase price, and percent ownership after the transaction is over. The market capitalization from CRSP and the purchase price, from SDC Thompson Financial Database will allow the computation of relative size between the acquirer and target.

SECTION 3.3.2 THE SURVEY INSTRUMENT

A survey is used because much of the data needed for analysis in this study cannot be derived from the various secondary data sets. For example, how quickly the target firm is integrated into the acquirer is at best sketchy from the annual report. Further, most annual reports do not discuss when the target firm is fully integrated, nor do they report the details, such as the contribution of IS/T in various capacities, which is demanded in this research model.

For the reasons stated above, a survey will be used to collect the data not available from the secondary data sources. There are many experimental studies on M&As that use surveys to collect data (Capron and Pistre, 2002; Cording, 2004; Feldman and Spratt, 1999; Harzing, 2002). Questions already empirically tested by other researchers will be augmented with additional questions. Survey items for the factors in the model will be described in detail along with an explanation of how the items were generated. For the exact wording of the survey items, please refer to the included sample survey.

Strategic Objectives

The items for assessing the strategic objectives for a particular M&A are derived from Capron and Pistre (2002), Cording (2004), Feldman and Spratt (1999), and Harzing

Table 3-3 Determining M&A Type		
Was the target firm a current or potential competitor?	Was the target firm a part of your supply/distribution chain?	M&A Type
Yes	No	Horizontal
Yes	Yes	Vertical
No	Yes	Vertical
No	No	Conglomerate

(2002). Data on strategic objectives will be collected in Part I of question 14 in the survey. The breakdown into the four different M&A strategic objective types is described in Table 3-1. The validity and reliability of many items will be fully documented for the first time, as many of the studies did not provide these statistics.

M&A Demographic Data

This study will collect the following demographic variables from the survey: M&A type, M&A attribute, M&A integration planning, and speed of M&A integration. The M&A type is determined by questions six and seven in the survey. Question six: “Was the target firm a current or potential competitor?” will determine if this M&A is a horizontal M&A. Question seven: “Was the target firm a part of your supply chain (upstream or downstream)?” will determine if the M&A is a vertical integration or diversification M&A. See Table 3-3 for examples on how M&A type is determined.

M&A attribute is represented by questions eight and nine in the survey. Question eight asks, “Did the target firm initiate this M&A?”, and question nine asks, “Did the target firm resist this M&A?” If the answer to question eight is “yes” and the answer to question nine is “no,” then the M&A is assumed to be a rescue M&A. If the answer to question eight is “no” and the answer to question nine is “yes,” then the M&A is assumed to be a hostile takeover. If the answer to question eight is “no” and the answer to

Did the target firm initiate this M&A?	Did the target firm resist this M&A?	M&A Attribute
Yes	No	Rescue
Yes	Yes	Not Possible
No	Yes	Hostile Takeover
No	No	Collaborative

question nine is “no,” then the M&A is assumed to be a collaborative M&A. If the answers to both questions are “yes,” then the entire survey response may need to be eliminated because it is not possible for this response to occur. See Table 3-4 for examples on how M&A attribute is determined.

M&A integration planning is represented by questions 10 to 13 where question 10 asks, “Please indicate when IS/T officer started to get involved in the M&A activity?” Question 11 asks, “Was there a formal plan for the post-M&A integration process?” Question 12 asks, “Was IS/T integration specified in the post-M&A integration plan?” And lastly, Question 13 asks, “Was there a task force responsible for the post-M&A integration?”

Items used to measure the speed of integration are based on the strategic objectives. The speed of integration will be based on data from two sources. First, the date when the target company and the acquirer became one company can be retrieved from secondary data sources. Second, the integration progress of the subsequent business activities will be obtained from the survey. Data on the speed of integration will be collected from Part II, question 14 in the survey.

Role of IS/T

The role of IS/T is represented by questions 15 to 17. These items are being introduced for the first time in academic research. Question 15 asks whether or not IS/T contributed to any of the strategic objectives. Question 16 will attempt to validate the responses from question 15 by determining if the responses from questions 15 and 16 are consistent. Question 17 relates to how the IS/T is integrated in the M&A setting.

IS/T Performance

IS/T performance will be based on user satisfaction, as developed by Doll and Torkzadeh (1988). Data collected in this survey on IS/T performance will be in question 20.

M&A Performance

While the M&A performance will be based on secondary data, the pilot study indicates that the respondents to the survey want to describe the successfulness of their M&A. Hence, questions 18, 19, and 21 are incorporated into the survey. Items in this section may eventually be analyzed by using the attribution theory.

SECTION 3.3.3 SAMPLE

The sample will be retrieved from the SDC Thompson Financial Database. All transactions since 1996 will be examined to determine the experience of the acquirer.

There are three criteria for the inclusion of a firm into the population:

1. The firm must have completed at least one M&A since March 2003. The purchase price and the percentage of ownership for the acquirer must be disclosed. Additionally, the acquirer should own more than 50 percent of the target after the completion of the M&A.

2. The firm must be publicly traded so that financial reports and other accounting numbers are reported to various government agencies and can easily be retrieved.
3. The firm must be a US company; this will account for the differences in national culture that would confound the performance of the M&A.

Section 3.4 Statistical Analysis Techniques

This section will describe the various tests that will be used with the survey data. The discussion begins with a step by step procedure for all of the hypotheses and the expected results, and ends with the power analysis to estimate how many responses are needed and how many surveys must be sent.

SECTION 3.4.1 HYPOTHESIS TEST PROCEDURE

The primary technique used to test the theories is correlation analysis, however, regression analysis, discriminate function analysis, and logistic regression will be employed for additional statistical support. Items such as strategic objectives, role of IS/T, and IS/T performance will be aggregated by taking the average of each item within each sample. The techniques used to test the various hypotheses are as follows:

Hypothesis #1: For each survey response, the average priority for each of the four types of strategic objectives from survey question 14 part I and the average IS/T contribution for each of the four types of strategic objectives from survey question 15 will be computed. The correlation coefficient between the average of the strategic priority level and average IS/T contribution will be computed. For example, the strategic objective of increased efficiency includes the average priority level of the following

items: access to supplier, gaining market power, opportunity to achieve greater economies of scale, opportunity to achieve greater economies of scope, reduction in the number of employees, reduction of duplicate and/or non-core operations, and turn around of a failing target (see Table 3-1). For each survey response, the average priority level and IS/T contribution of these seven items will be computed. The correlation coefficient and probability value (p-value) between these two averages will be calculated.

Hypothesis #1a will have support if the correlation coefficient is positive.

Hypothesis #2: For each survey response, the average priority for the non-RBT strategic objectives from survey question 14 part I and the difference in the return-on-invested-capital (ROIC) between one quarter before the M&A and two quarters after the M&A will be computed. The correlation coefficient and probability value (p-value) between the priority level of non-RBT strategic objectives and the difference in the ROIC will be calculated. Hypothesis #2 will have support if the correlation coefficient is negative.

Hypothesis #3: For each survey response, the average IS/T contribution of all the strategic objectives from survey question 15 and the level of M&A integration planning from survey questions 10, 11, 12, and 13 will be computed. The level of M&A integration planning will be computed using the following formula:

$$(F10) \left(\frac{(F11 + F12 + F13)}{(1 + F11 + 1)} + 1 \right)$$

For an example of how the formula will be used, please see Table 3-5. The correlation coefficient and probability value (p-value) between the average IS/T contribution and the level of M&A integration planning will be calculated. Hypothesis #3 will have support if the correlation coefficient is positive.

Table 3-5 Computing Level of M&A Integration Activity		
Question	Answer	Assigned Value
10 Please indicate when IS/T officer started to get involved in the M&A activity?	IS/T professional was not involved.	1
	At strategic assessment meeting.	7
	At target selection meeting.	6
	At target evaluation meeting.	5
	During negotiation with the target firm.	4
	During integration planning meeting.	3
11 Was there a formal plan for the post-M&A integration process?	During post-M&A integration.	2
	Yes	1
	No	0
	Yes	1
	No	0
	No Answer	0
12 Was IS/T integration specified in the post-M&A integration plan?	Yes	1
	No	0
	No Answer	0
13 Was there a task force responsible for the post-M&A integration?	Yes	1
	No	0
Example 1		
Question	Answer	Assigned Value
10	During post-M&A integration.	2
11	No	0
12	No Answer	0
13	No	0
Level of Integration Activity		2
Example 2		
Question	Answer	Assigned Value
10	At target evaluation meeting.	5
11	Yes	1
12	No	0
13	Yes	1
Level of Integration Activity		8.33

Hypothesis #4: For each survey response, the level of M&A integration planning from survey questions 10, 11, 12, and 13 and the average completion level from survey question 14 part II will be computed. The correlation coefficient and probability value (p-value) between the level of M&A integration planning and average completion level

will be calculated. Hypothesis #4 will have support if the correlation coefficient is positive.

Hypothesis #5: For each survey response, the relative size between the target and acquirer and the average contribution of IS/T from survey question 15 will be computed. The relative size between the acquirer and target will be computed by using the acquisition cost or target purchase price over the market capitalization of the acquirer at the time of completion. The correlation coefficient and probability value (p-value) between the relative size and average contribution of IS/T will be calculated. Hypothesis #5 will have support if the correlation coefficient is positive.

Hypothesis #6: For each survey response, the M&A experience of the acquirer and the average contribution of IS/T from survey question 15 will be computed. The experience of the acquirer will be determined by counting the number of acquisitions the acquirer made over the past three years. The correlation coefficient and probability value (p-value) between the M&A experience of the acquirer and the average contribution of IS/T will be calculated. Hypothesis #6 will have support if the correlation coefficient is negative.

Hypothesis 7: For each survey response, the M&A experience of the acquirer and the average completion level from survey question 14 part II will be computed. The correlation coefficient and probability value (p-value) between the M&A experience of the acquirer and the average completion level of the M&A will be calculated. Hypothesis #7 will have support if the correlation coefficient is positive.

Hypothesis #8: For each survey response, the average priority for each of the four types of strategic objectives from survey question 14 part I, the average IS/T contribution

for each of the four types of strategic objectives from survey question 15, and the average IS/T performance from survey question 20 will be computed. The priority level of the four types of strategic objectives and the average IS/T contribution for each of the four types of strategic objectives will then be normalized to one, or the maximum priority level/contribution will be set to one and the lowest priority level/contribution to zero. The alignment of IS/T and the firm's strategic objectives will be determined by taking the normalized sum of priority level and IS/T contribution divided by the absolute difference between the priority level and IS/T contribution. The correlation coefficient and probability value (p-value) between IS/T alignment and IS/T performance will be calculated. Hypothesis #8 will have support if the correlation coefficient is positive.

Hypothesis #9: For each survey response, the alignment between IS/T and M&A strategic objectives and the improvement in ROIC will be computed. The correlation coefficient and probability value (p-value) between IS/T alignment and M&A performance will be calculated. Hypothesis #9 will have support if the correlation coefficient is positive.

Hypothesis #10: For each survey response, the average completion level from survey question 14 part II and the improvement in ROIC will be computed. The correlation coefficient and probability value (p-value) between the average completion level and M&A performance will be calculated. Hypothesis #10 will have support if the correlation coefficient is positive.

Hypothesis #11: For each survey response, the average IS/T performance from survey question 20 and the improvement in ROIC will be computed. The correlation coefficient and probability value (p-value) between the average IS/T completion level

and M&A performance will be calculated. Hypothesis #11 will have support if the correlation coefficient is positive.

SECTION 3.4.2 POWER ANALYSIS

Based on the initial pilot study, the average and standard deviation for various groups were computed (see Table 3-6). For a type I error of five percent and type II error of ten percent, the number of survey responses needed is estimated to be about 116. Since the pilot study had a return rate of about 12%, the main study will need to contact 937 companies to obtain 116 responses (see Table 3-7).

Groups	Sample Size	Average of M&A Performance	Standard deviation of M&A Performance
High efficiency priority	4.0000	-0.0030	0.0308
High new products priority	7.0000	-0.0161	0.0670
High increase sales priority	17.0000	-0.0034	0.0333
High misc. priority.	4.0000	0.0216	0.0255
Overall standard deviation of M&A Performance			0.0437

Table 3-7
Power Analysis

Size of n for comparison for two groups.

$$n = \frac{2(Z_\alpha + Z_\beta)^2 \sigma^2}{(\mu_1 + \mu_2)^2}$$

Since

$Z_\alpha = 1.96$ for a two sided test with $\alpha = 5\%$

$Z_\beta = 1.28$ with $\beta = 10\%$

$\sigma = 0.0437$

$\mu_1 = 0.0216$

$\mu_2 = -0.0161$

$n = 28.10$ or 29

Since there are four groups, the minimum total response would be $4n$ which is 116.

Chapter 4 Data Analysis and Discussion

This chapter, following the research hypothesis and methodology described in Chapter 3, presents the results of the data analysis. In the first section, the sample is described along with a number of summary statistics on the demographics of the sample. Section two presents the results of the data analysis for the hypotheses tested in this research study along with the conclusions that may be drawn from this research study. The final section of this chapter will summarize the general conclusions that may be drawn from this study. The next chapter will discuss the limitations of this study and potential future research directions on the role of IS/T in M&A.

Section 4.1 Sample Description

The sample response will be analyzed in this section. The discussion begins by reporting the statistics relating to the data collection. The demographics of the respondent are presented next. It is followed by discussing the process for determining if there is a significant bias in the response along with the result of the analysis. The section ends with a potential conclusion from the analysis.

The survey instrument was sent to all companies that have made at least one acquisition from March 2003 to January 2005. A total of 1497 companies were contacted. There were 33 companies with a company policy of not responding to surveys and 7 additional companies with an undeliverable address which resulted in an effective number of 1457 companies that could participate in this survey. These 1457 companies were contacted and 133 responded to the survey, for an response rate of 9.1%.

The self reported title of the respondents ranged from chief executive officers to vice president; more than 50% of the respondents were either the chief executive officer,

Position	Number of respondents	Percentage of total respondents
Chief Executive Officer / President	37	26.61%
Chief Financial Officer	35	25.17%
Vice President	28	20.14%
Senior Vice President	20	14.39%
Chief Information Officer	14	10.07%
Chief Operating Officer	12	8.63%
Executive Vice President	8	5.76%
Note: it is possible for the respondent to hold more than one position		

president, or chief financial officer. The survey focused on the role of information systems / information technology (IS/T) and more than 10% of the respondents self reported that they were the chief information officer for the firm. See Table 4-1 for details.

Among the respondents, 64.75% reported that they had responsibilities in the firm's strategic planning, 52.52% had responsibilities for business development, and 51.80% had responsibilities in general administration. As for the integration process of the IS/T after an M&A, 28.06% of the respondents had responsibility for operations and 25.90% of the respondents had responsibility for IS/T (see Table 4-2 for details).

Concerning tenure, more than 75% of the respondents had worked with the current company for more than 3 years (see Table 4-3 for details) and a little over half of the respondents had at least 3 years of IS/T experience (see Table 4-4 for details). This suggests that most of the respondents had, at the minimum, observed the integration process since the beginning of the transaction and were at least somewhat familiar with general issues associated with IS/T.

The procedure to determine if there was any bias in the responses is as follows: 1 - two demographic variables, target purchase price, and acquisition experience, are used to

Function	Number of respondents	Percentage of total respondents
Strategic Planning	90	64.75%
Business Development	73	52.52%
Administration	72	51.80%
Operations	39	28.06%
IS/IT	36	25.90%
Human Resources	28	20.14%

Note: it is possible for the respondent to perform more than one function in the company

Period	Number of respondents	Percentage of total respondents
No Response	1	0.71%
Less than 1 year	6	4.29%
1 to 3 years	26	19.29%
3 to 5 years	17	12.14%
5 to 10 years	41	29.29%
More than 10 years	48	34.29%

Years of IS/T experience	Number of respondents	Percentage of total respondents
No Response	13	9.29%
Less than 1 year	60	42.86%
1 to 3 years	6	4.29%
3 to 5 years	7	5.00%
5 to 10 years	9	6.43%
More than 10 years	44	32.14%

determine if the sample response is representative of the mailing list. These two variables provide the opportunity to perform three tests as there are two factors in acquisition experience, three years acquisition experience and five years acquisition experience. 2 - the target purchase price and acquisition experience are divided into different categories (see Table 4-5 and Table 4-6 for details) and the corresponding percentages for each category is determined. 3 - the category for the three factors are determined for each survey response. 4 - a goodness-of-fit test is used to determine if

Price (p) in Millions	Category Number	Percentages
$p < \$1$	1	0.0328
$\$1 \leq p < \5	2	0.1226
$\$5 \leq p < \25	3	0.2755
$\$25 \leq p < \100	4	0.2661
$\$100 \leq p < \500	5	0.2279
$\$500 \leq p$	6	0.0751

Three Years of Experience			Five Years of Experience		
Number of Acquisitions	Category Number	Percentages	Number of Acquisitions	Category Number	Percentages
1	1	0.4088	1	1	0.2989
2	2	0.1984	2	2	0.1575
3 to 5	3	0.2661	3 to 5	3	0.2949
6 to 10	4	0.0892	6 to 10	4	0.1515
more than 10	5	0.0375	10 to 20	5	0.0664
			more than 20	6	0.0308

there is any significant difference between the mailing population and the responses. As Tables 4-7, 4-8, 4-9 show, there is no significant difference between the mailing list population and the sample response. The p-value for all three tests is greater than 20%. This would suggest that the sample response is a good approximation of the entire population and is without bias at least in the purchase price and M&A experience.

Comparing the self reported title(s) and the self reported role(s) of the respondent, one can argue that the respondents were consistent in responding to the demographic portion of the survey. The expectation that chief executive officer, president, and chief financial officer would be part of the management team that decides on the strategic direction is, therefore, somewhat confirmed. Further, since only about 10% of the respondents were the chief information officer and about a quarter of the respondents

Table 4-7					
Goodness-of-Fit Test on Target Purchase Price					
Category	Freq.	Percent (%) ¹	Test % ²	Cumulative Freq.	Cumulative %
1	2	1.50	3.28	2	1.50
2	21	15.79	12.26	23	17.29
3	37	27.82	27.55	60	45.11
4	37	27.82	26.61	97	72.93
5	29	21.80	22.79	126	94.74
6	7	5.26	7.51	133	100.00
Chi-Square Test for Specified Proportions					
Chi-Square 3.6581					
DF 5					
Pr > ChiSq 0.5996					
Sample Size = 133					
1. Result from the survey 2. Distribution from the mailing sample					

Table 4-8					
Goodness-of-Fit Test on Three Years of Acquisition Experience					
Category	Freq.	Percent (%) ¹	Test % ²	Cumulative Freq.	Cumulative %
1	61	45.86	40.88	61	45.86
2	25	18.80	19.84	86	64.66
3	35	26.32	26.61	121	90.98
4	8	6.02	8.92	129	96.99
5	4	3.01	3.75	133	100.00
Chi-Square Test for Specified Proportions					
Chi-Square 2.3394					
DF 4					
Pr > ChiSq 0.6736					
Sample Size = 133					
1. Result from the survey 2. Distribution from the mailing sample					

Table 4-9					
Goodness-of-Fit Test on Five Years of Acquisition Experience					
Category	Freq.	Percent (%) ¹	Test % ²	Cumulative Freq.	Cumulative %
1	50	37.59	29.89	50	37.59
2	23	17.29	15.75	73	54.89
3	34	25.56	29.49	107	80.45
4	12	9.02	15.15	119	89.47
5	9	6.77	6.63	128	96.24
6	5	3.76	3.08	133	100.00
Chi-Square Test for Specified Proportions					
Chi-Square 7.0358					
DF 5					
Pr > ChiSq 0.2180					
Sample Size = 133					
1. Result from the survey 2. Distribution from the mailing sample					

were responsible for the IS/T operation of the firm, it appears that the respondents did not exaggerate their authority or responsibilities. This provides some added confidence that the subsequent responses were accurate.

Section 4.2 Testing Hypotheses and Implications

A discussion of the data analysis testing the various hypotheses is the focus of this section. The hypotheses will be restated for easy reference. They will be followed by a summary of the statistical analyses and conclusions about empirical support for the hypotheses. Discussions and implications of the data analysis will follow. The limitations and potential improvements will be discussed in Chapter 5.

Hypothesis #1 - The priority for the strategic objective of an M&A will be positively associated with the contribution of IS/T to that strategic objective. Specifically, the priority for efficiency improvement, sales growth, new products, and non-RBT will be positively associated with the contribution of IS/T in efficiency improvement, sales growth, new products, and non-RBT objectives respectively. The data analysis will provide some support for this hypothesis, especially for the efficiency and non-RBT objectives (see Table 4-10) as the test shows a highly significant p-value ($p < 0.0001$) and the correlation coefficient is the highest for both the type of strategic objective and the contribution from IS/T to the strategic objective. The correlation coefficients for new products and increased sales are highly significant ($p < 0.0001$ for new product and $p = 0.0003$ for increased sales) but it is not the highest for both the type of strategic objective and the contribution from IS/T to the strategic objective. Hence, there is support for efficiency and non-RBT objectives, but not unqualified support for new product and increased sales objectives.

Table 4-10 Correlation Coefficients Between Priority of Strategic Objectives and IS/T Contribution				
IS/T Contribution to	M&A Objectives			
	Efficiency	New Product	Increase Sales	Non-RBT
Efficiency	r=0.64442 p<0.0001 N=134	0.34476 p<0.0001 134	0.34233 0.0001 134	0.55271 <0.0001 133
New Product	0.45691 <0.0001 134	0.39962 <0.0001 134	0.25235 0.0033 134	0.46195 <0.0001 133
Increase Sales	0.37160 <0.0001 136	0.26358 0.0019 136	0.30383 0.0003 136	0.43927 <0.0001 135
Non-RBT	0.51762 <0.0001 133	0.28681 0.0008 133	0.33931 <0.0001 133	0.55776 <0.0001 133

An additional analysis was proposed where each transaction was categorized into one of the four objectives using the ranking of the individual strategic goals. However, there was insufficient data from the surveys to complete this step. Many of the respondents did not answer this portion of the survey. Other respondents did not answer enough items to make a useful category. Still others answered the items in accordance with the IS/T contribution instead of strategic objectives. Less than 30% of the respondents ranked items with higher strategic priorities first.

While the practitioners and consultants have suggested that the contribution of IS/T will have a positive correlation with strategic objectives, there have been no rigorous academic studies to confirm this claim until now. While this finding did not fully support the claim made by practitioners and consultants, it can still provide a foundation for future research.

Hypothesis #2 - The priority for non-RBT objectives will be negatively associated with the performance of the M&A. This hypothesis was an attempt to confirm the

Table 4-11 Correlation Coefficients Between Priority of Strategic Objectives and M&A Performance				
M&A Performance Measures	M&A Objectives			
	Efficiency	New Product	Increase Sales	Non-RBT
Revenue From Target (Survey)	r=0.06224 p=0.4750 N=134	0.06851 0.4298 135	0.14308 0.0978 135	0.02932 0.7385 132
Revenue From Acquirer (Survey)	-0.00868 0.9204 135	-0.01832 0.8324 136	0.03024 0.7268 136	-0.07819 0.3710 133
Changes in ROIC (From COMPUSTAT)	-0.05686 0.5305 124	-0.05735 0.5252 125	-0.05597 0.5353 125	-0.06828 0.4511 124

Resource-Based Theory (RBT) of the firm since the non-RBT objectives do not provide increased efficiency for the firm. Although the correlation factor for non-RBT objectives and the objective performance measure, changes in return on capital (ROIC), is the lowest negative value of the four types of strategic objectives in this study, it is not significant (see Table 4-11 for details). While the study provided an opportunity to test the RBT, the data analysis did not confirm or disprove the theory. The future research may focus on the individual objectives and identify which strategic objectives would yield the lowest M&A performance. If the survey instrument is able to obtain enough respondents to correctly rank the individual objectives, one may then be able to analyze at the individual objective level.

Hypothesis #3 - The existence of M&A integration planning activity will be positively associated with the contribution of IS/T. While the IS/T contribution did correlate positively when IS/T got involved in the M&A, the level of M&A planning correlated negatively with IS/T contribution. Additionally, all of the correlation coefficients were less than 0.06, suggesting that there was no significant correlation

Table 4-12 Correlation Coefficients Between M&A Planning and IS/T Contribution				
Planning Activities	IS/T Contribution			
	Efficiency	New Product	Increase Sales	Non-RBT
When did IS/T get involved in M&A?	r=0.00643	0.02622	0.02909	0.02386
	p=0.9428	0.7698	0.7434	0.7909
	N=127	127	129	126
Level of M&A Planning	r=-0.05247	-0.00544	-0.01484	-0.01942
	p=0.5533	0.9510	0.8658	0.8271
	N=130	130	132	129

between the IS/T contribution and the M&A planning effort. Further, none of the correlation coefficients were significant even at the $p=0.10$ level (see Table 4-12 for details). The data analysis did not provide any support for this hypothesis.

While it makes sense that there should be a positive correlation between M&A planning and the IS/T contribution, the data suggested otherwise. There are two possible explanations for this result: 1) problems with the survey instrument, 2) too high expectations placed on the use of IS/T from the company. The survey instrument may need to be adjusted to categorize each M&A to one strategic objective. As discussed earlier, this analysis was not possible because of response problems. It may be addressed in a future study by redesigning the survey instrument.

However, if the IS/T resource for most companies has not been used as a strategic tool, then the senior managers would not rely on IS/T for many strategic tasks. This would imply that IS/T played a very minor role in the M&A integration effort of most companies. For companies that do use IS/T to assist in the integration process, the role may be more tactical instead of strategic in nature. This may be a more plausible explanation as to why the IS/T contribution was not positively associated with the level of M&A planning. One may not be able to find any association between IS/T

Table 4-13 Correlation Coefficients Between M&A Planning and Speed of Integration				
Planning Activities	Speed of Integration			
	Efficiency	New Product	Increase Sales	Non-RBT
When did IS/T get involved in M&A?	r=0.06214	-0.06890	0.06983	0.11005
	p=0.4984	0.4585	0.4390	0.2335
	N=121	118	125	119
Level of M&A Planning	-0.00710	-0.11182	0.01192	0.02751
	0.9376	0.2221	0.8937	0.7636
	124	121	128	122

contribution and M&A planning until more companies view IS/T as a critical resource or become dependent on IS/T to sustain or improve overall company performance.

Hypothesis #4 - The existence of M&A integration planning activity will be positively associated with the speed of integration. The correlation results were inconclusive, both positive and negative. None of the correlation coefficients were significant even at the $p=0.10$ level (see Table 4-13 for details). The data analysis did not provide support for this hypothesis.

The data analysis suggests that there is no significant correlation between M&A planning and the speed of integration. Possible explanations for this result may be that speed of integration may be affected by other factors which were not tested in this study: for example, the size of the transaction, the relationship between the acquirer and target, or the process of due diligence that the acquirer employed for transaction.

The speed of integration may be affected by the size of the target. There are, however, two possible ways that the size of the target can affect the speed of integration. First, if the size of the target is relatively small, then the acquirer should be able to absorb the target easily. This will lead to a faster integration process, which will yield a negative correlation between the size of the target with the speed of integration. Second,

for targets that are relatively large, it may require more attention from the senior management team which can result in a faster integration process as well. This could lead to a possible positive correlation between the size of the target with the speed of integration.

Similarly, the speed of integration may be affected by the relationship between the acquirer and target, their friendliness or hostility toward each other. Again, there may be two possible relationships. One may expect that if the target and acquirer have a friendly relationship, there will be more cooperation during the integration process. That could mean a possible positive correlation between the level of friendliness with the speed of integration. However, the opposite could occur if problematic issues were avoided and deferred to preserve a cordial relationship. That would lead to delays in addressing certain critical issues during the integration and result in a subsequent delay in integration.

The due diligence process may represent the best predictor of the speed of integration. However, how to measure the due diligence process poses a problem. If one just measures satisfaction with the due diligence process employed by the acquirer, that satisfaction could be limited by the amount of resources available. One probably should avoid using the amount of time the acquirer knew the target because the length of their relationship may not necessarily provide greater insight into the target. One may need to use several questions to assess how the due diligence was conducted and whether there are still surprises during the integration portion of the acquisition.

Hypothesis #5 - The relative size of the acquirer and target will be positively associated with the contribution of IS/T in an M&A. None of the correlation coefficients

Table 4-14 Correlation Coefficients Between Relative Size and IS/T Contribution				
Relative Size	IS/T Contribution			
	Efficiency	New Product	Increase Sales	Non-RBT
Bid Price and Market Capitalization	r=-0.08956 p=0.3128 N=129	-0.07671 0.3876 129	0.00820 0.9260 131	-0.07482 0.4013 128

here were above 0.10 in magnitude and were not significant at the $p=0.10$ level (see Table 4-14 for details). The data analysis did not provide support for this hypothesis.

The data analysis indicates that the size difference between acquirer and target has no impact on how IS/T will contribute to the M&A. It is possible that the relationship between relative size and IS/T contribution are moderated by other factors such as level of IS/T expertise, M&A type, or M&A attribute.

A better predictor in the utilization of IS/T during the integration phase of M&A may be the level of expertise of IS/T at the acquirer and target. An objective measure such as percentage of expenditure that can be classified as IS/T, percentage of IS/T personnel relative to the total employees in the firm, and percentage of assets that can be classified as IS/T are not available from public sources. Asking the senior executive about the firm's IS/T expertise would not in itself be foolproof because senior executives who have frequent contact with the IS/T services may not know the necessary specifications. Hence, while the IS/T expertise may modify the relationship between relative size and IS/T contribution, one would not be able to do such an analysis because of the difficulty in obtaining the needed data on IS/T expertise.

Other possible explanations for the result may be that the relationship between the relative size and IS/T contribution is moderated by other variables such as the

Table 4-15 Correlation Coefficients Between M&A Experience and IS/T Contribution				
M&A Experience	IS/T Contribution			
	Efficiency	New Product	Increase Sales	Non-RBT
Number of M&As in the Past 3 Years	r=-0.06245 p=0.4735 N=134	-0.01398 0.8726 134	0.02840 0.7428 136	0.00162 0.9853 133
Number of M&As in the Past 5 Years	-0.02004 0.8182 134	-0.01451 0.8678 134	0.04548 0.5991 136	0.02856 0.7442 133

friendliness between the target and acquirer, or whether the acquisition is a horizontal merger, vertical integration, or diversification. The contribution from IS/T resources may be highly dependent on the type of environment in which it is used and how it is intended to be used. That is, the process to apply the IS/T resources in a friendly acquisition, vertical integration, and new product introduction may be much different from a cooperative acquisition, vertical integration, and new product introduction. The result of this study should be used as a basis to formulate new hypotheses for future research to validate.

Hypothesis #6 - The M&A experience of the acquirer will be negatively associated with the contribution of IS/T in M&A. The data analysis did not provide support for this hypothesis, all of the correlation coefficients were below 0.07 in magnitude and not significant at the 0.10 level (see Table 4-15 for details).

Similar to hypothesis #5, the data analysis suggested that there was no correlation between M&A experience and IS/T contribution. How IS/T contribution is affected by M&A experience may be affected by other variables such as similarity between the current acquisition and prior acquisitions. Moreover, not all M&A experiences are equivalent and learning during one may not transfer easily to another, to M&As

investigated by other researchers (Beckman, Haunschild, 2002; Finkelstein, Halebian, 2002). The ability to determine how similar the current transaction was with prior transactions may improve predictions between M&A experience and IS/T contribution. If the firm has multiple acquisitions and one prior acquisition, acquisition A, is considered as similar to the current acquisition, acquisition B, one may need to ask how many other acquisitions are there between acquisition A and acquisition B? How much time has passed between acquisition A and acquisition B? Were the two acquisitions managed by the same management team or manager? If these questions were to be addressed in future research, one should create new survey questions before investigating the relationship between M&A experience and IS/T contribution.

It is possible, however, that the relationship between IS/T contribution and M&A experience may not exist. The r and p-value from this analysis (Table 4-15) suggest that there is no correlation between IS/T contribution and M&A experience as one has a very low r with a p-value that is at least 50%. This indicates that the level of IS/T contribution does not explain the M&A experience of the firm. M&A experience may be just a demographic variable that needs to be controlled when examining the contribution from IS/T.

Hypothesis #7 - The M&A experience of the acquirer will be positively associated with the speed of integration. The data analysis did not provide support for this hypothesis as all of the correlation coefficients were below 0.08 in magnitude and not significant at the 0.10 level (see Table 4-16 for details).

As with the previous two hypotheses, the data analysis suggested that there was no correlation between M&A experience and integration speed. This was very surprising

Table 4-16 Correlation Coefficients Between M&A Experience and Integration Speed				
M&A Experience	Integration Speed			
	Efficiency	New Product	Increase Sales	Non-RBT
Number of M&As in the Past 3 Years	r=0.05134 p=0.5650 N=128	-0.05239 0.5617 125	-0.07053 0.4216 132	0.03766 0.6755 126
Number of M&As in the Past 5 Years	-0.00368 0.9671 128	-0.10028 0.2658 125	-0.10902 0.2134 132	0.00479 0.9575 126

since one would expect the more experience a company has had with M&A, the faster it could integrate the target business. It is possible that the integration speed is affected more by relative size, M&A type, M&A attribute, specific M&A objectives, or even similarity with prior acquisition.

The speed of integration may be affected by the environment or intent of the acquisition. Kitching (1967) pointed out that as the similarity between the target business and the acquirer increases, the difficulties in managing the target business increases. Such an increase in the difficulty would lead to delays in the integration process. Similarly, a hostile acquisition would encounter resistance from the employee of the target firm which may result in delays in the completion of various tasks. As such, there may be variables that affect the relationship between the speed of integration with M&A experience.

Hypothesis #8 - The alignment of the role of IS/T with the firm's strategic objectives will be positively associated with the performance of IS/T. Support for this hypothesis came from the alignment of efficiency and new products objectives where the correlation coefficients were significant at the 0.05 level for the efficiency objectives and 0.10 level for the new product objectives (see Table 4-17 for details).

Table 4-17 Correlation Coefficients Between Alignment of Strategic Objectives with IS/T Contribution and IS/T Performance				
IS/T Performance	Alignment of Strategic Objectives with IS/T Contribution			
	Efficiency	New Product	Increase Sales	Non-RBT
Performance of Acquirer IS/T	r=0.19390 p=0.0346 N=119	0.16283 0.0768 119	0.13255 0.1472 121	-0.03297 0.7219 119
Performance of Target IS/T	0.09489 0.3309 107	0.06713 0.4921 107	0.02717 0.7802 108	-0.02804 0.7744 107
Performance of Overall IS/T	0.18303 0.0454 120	0.16347 0.0744 120	0.13785 0.1300 122	-0.00544 0.9530 120

Further examination of the data revealed that the correlation with IS/T performance mostly came from the capabilities of the acquirer. The correlation coefficient and the significant level from the performance of the acquirer's IS/T were similar to the performance of overall IS/T with the alignment of IS/T contribution and strategic goals.

While the data did not lend full support to the hypothesis that IS/T alignment is important to the organizational goal, the study did identify a region where IS/T professionals or integration managers could focus their efforts. IS/T professionals and integration managers should focus their efforts on increasing efficiency goals or assisting the introduction of new products. Increase efficiency and new product introduction may demand more IS/T functionality than increase sales. One can envision the possibility that increase sales may not need computerized IS/T because the sales force only needs a hard copy of the new products that they are responsible to sell. However, efficiency and new product introduction would require in addition to the function of information

Table 4-18 Correlation Coefficients Between Alignment of Strategic Objectives with IS/T Contribution and M&A Performance				
M&A Performance	Alignment of Strategic Objectives with IS/T Contribution			
	Efficiency	New Product	Increase Sales	Non-RBT
Revenue From Target (Survey)	r=0.03923 p=0.6577 N=130	0.05818 0.5109 130	0.04553 0.6041 132	0.03021 0.7339 129
Revenue From Acquirer (Survey)	0.13527 0.1235 131	0.14439 0.0999 131	0.21280 0.0139 133	0.13228 0.1336 130
Changes in ROIC (From COMPUSTAT)	0.10585 0.2479 121	0.01527 0.8680 121	-0.02921 0.7484 123	-0.03336 0.7152 122

dissemination, information storage along with quick update to the most current status.

Such a task would be very time consuming if no computerized IS/T is available.

Future research, however, should identify if the increase efficiency is a result of eliminating duplicated IS/T resources or if IS/T was helped to identified duplicated assets for the combined firm. The distinction is important because in the first case, elimination of duplicated IS/T resources, the firm uses IS/T at the tactical level. Whereas in the later case, IS/T assisting the identification of wastes, the firm uses IS/T strategically. If both are occurring, then it may be interesting to see if there are any performance differences between the two different uses of IS/T.

Hypothesis #9 - The alignment of the role of IS/T and the strategic objectives will be positively associated with the performance of the M&A. Data indicated that the performance of the acquirer, based on self reported revenue, correlated with new products and increased sales; however, data analysis on the objective measure, return on capital, did not result in a significant correlation at the 0.10 level (see Table 4-18 for details). Therefore, data analysis did not provide support for this hypothesis.

This hypothesis addressed the important question of whether IS/T could contribute to the overall performance of the firm, and hence be considered as a strategic tool. However, unlike hypothesis #8 where IS/T contribution had a positive correlation with IS/T performance, the data suggests that there was no relationship between IS/T contribution and M&A performance. There are at least two possible explanations of the observed result. First, the intervention of other variables is always of concern, but in this case there was no obvious variable to suspect. Second, as was noted in the discussion of hypothesis #3, where IS/T may not have provided a performance improvement because it was not utilized at the strategic level, using IS/T at the tactical level may not provide opportunities for IS/T to contribute to the overall performance of the firm.

Hypothesis #10 - The speed of integration will be positively associated with the M&A performance. The data analysis provided partial support for this hypothesis. It appeared that the speed of integration was important when the overall objective of the M&A was to introduce new products; in that case the correlation coefficient was about 0.20, significant at the 0.05 level. Additional analysis suggested that this result for new products was affected by the revenue of the target which showed a lower correlation coefficient, 0.17, but a higher significance level, significant at the 0.10 level (see Table 4-19 for details).

The data analysis suggests that if the overall objective of the firm is to introduce a new product, then quick integration between the acquirer and target is important. For other strategic objectives, integration between the target and acquirer is not as important. It may be that increased efficiency can be achieved via head count reduction or asset closing which can be done without integration between the two firms. Similarly, if the

M&A Performance Measures	Speed of Integration			
	Efficiency	New Product	Increase Sales	Non-RBT
Revenue From Target (Survey)	r=0.10672 p=0.2362 N=125	0.16767 0.0660 121	0.14599 0.1001 128	0.02621 0.7745 122
Revenue From Acquirer (Survey)	0.03376 0.7074 126	0.01552 0.8739 122	0.10795 0.2233 129	-0.05623 0.5368 123
Changes in ROIC (From COMPUSTAT)	-0.04499 0.6346 114	0.19705 0.0373 112	-0.06135 0.5093 118	-0.09464 0.3165 114

overall objective of the transaction is to increase sales, existing sales force will only need to know that the firm now offers additional products that they can sell, and no integration at the business division is needed. As far as the non-RBT objectives, often the acquirer intends to run the various business units separately to achieve reduction in financial risk or if the expectation that the target may be sold off later and should not be integrated into the acquirer's company. In these situations, it makes sense that there is little or no integration progress.

Hypothesis #11 - The IS/T performance will be positively associated with the M&A performance. The data analysis actually suggested that the IS/T performance was negatively correlated with the M&A performance (see Table 4-20 for details). Since this is a one tail test with the prediction that IS/T performance will have a positive impact on M&A performance, the result indicates that there is no support for this hypothesis. The overall performance of IS/T correlated negatively with the objective measure of performance, changes in ROIC, and was significant at the $p=0.05$ level. Further analysis suggested that the negative performance came mostly from the performance of the target

Table 4-20 Correlation Coefficients Between M&A Performance and IS/T Performance			
M&A Performance	IS/T Performance		
	Performance of Acquirer IS/T	Performance of Target IS/T	Performance of Overall IS/T
Revenue from Target (Survey)	r=-0.11259 p=0.2248 N=118	-0.06837 0.4862 106	-0.13248 0.1492 120
Revenue from Acquirer (Survey)	-0.17138 0.0624 119	-0.18279 0.0595 107	-0.23093 0.0105 122
Changes in ROIC (from COMPUSTAT)	-0.16371 0.0860 111	-0.13947 0.1708 98	-0.18592 0.0497 112

IS/T. This result is counterintuitive in that it suggested an acquirer should not purchase a target with good IS/T capabilities because such action often results in lower performance. One possible explanation is: If the target's IS/T capability is better than the acquirer's and the acquirer tries to exploit the benefit of IS/T for the entire firm. However, trying to integrate or assimilate the target's IS/T may be too disruptive in the short run; what this study is measuring as performance, but it will result in greater value creation in the future. If the acquirer ignores the target IS/T and imposes its own IS/T on the target, there may be less disruptions in the short run but it may result in observable value destruction in the long run, which this study is not designed to measure. More investigation may be needed to assess the negative influence of M&A performance from IS/T performance.

Section 4.3 Additional Statistical Tests and Summary Discussion

This section starts by describing the need to examine the contribution to the M&A performance by demographic variables or controlled variables. Results from the various

Independent Variable	Changes in ROIC			Comments
	r^2	p-value	n	
Purchase Price	0.0004	0.8126	127	The price of the target is in millions of dollars.
Relative Size	0.0096	0.2839	121	Analyzing only Relative Size with ROIC. Relative Size is a ratio.
3 Years of M&A Experience	0.0039	0.4829	127	Experience is the number of acquisitions made in the 3 years prior to the current acquisition.
5 Years of M&A Experience	0.0055	0.4071	127	Experience is the number of acquisitions made in the 5 years prior to the current acquisition.

statistical tests that were used to analyze the demographic variables are presented next.

Some conclusions are discussed at the end.

From the literature review, many scholars suggested that various demographic variables, such as experience, relative size, industry, M&A strategic type, M&A attribute, and M&A planning may impact on the performance of M&A. This study, however, was not able to confirm these claims as hypotheses #3, #4, #5, #6, and #7 did not yield significant results with the intervening variables. With additional regression analysis, one finds that experience, and relative size do not absorb much variance for the dependent variables, changes in ROIC (see Table 4-21). The result suggests that there is no correlation between these demographic variables and the performance measures, and partially explain why hypotheses three to seven have no significant results. The result on purchase price and relative size, however, is somewhat consistent with the Beckman and Haunschild (2002) study indicating relative size has no impact on profitability.

Similarly, acquisition experience may be impacted by other factors such as organizational

Table 4-22 Multiple Regression Analysis on Industry Type with M&A Performance				
Industry		Multiple Regression on Changes in ROIC		
Name	Count	Parameter	t	Pr > t
Money Center	28	-0.00984	-0.07	0.9421
REIT	7	0.00130	0.01	0.9927
Insurance	4	-0.00775	-0.05	0.9620
Health	16	0.09201	0.66	0.5105
Business Service	20	-0.01891	-0.14	0.8897
Technology	34	-0.01096	-0.08	0.9353
Industrial Goods	8	0.02274	0.16	0.8718
Basic Material	8	-0.06757	-0.48	0.6297
Consumer Goods	6	-0.01325	-0.09	0.9264
Others	2	0.00235	0.01	0.9885
$r^2 = 0.0857$ $\text{Adj. } r^2 = 0.0062$ $\text{Model } p > 0.3845$ Firms in the other category are from: Conglomerate and Utility industries				

Table 4-23 Multiple Regression Analysis on M&A Type with M&A Performance			
M&A Type	Multiple Regression on Changes in ROIC		
	Parameter	t	Pr > t
Horizontal Acquisition	-0.00650	-0.21	0.8312
Vertical Integration	-0.01250	-0.24	0.8075
Conglomerate	-0.01679	-0.57	0.5689
$r^2 = 0.0028$ $\text{Adj. } r^2 = -0.0217$ $\text{Model } p > 0.9522$			

learning, as argued by Haywood (200) and Beckman and Haunschild (2002), which was not investigated in this study.

Other demographic variables, industry, M&A type, and M&A attributes cannot use a simple regression to determine if a relationship exists because these variables are categorical. Hence, each of these demographic variables must be broken into its distinct dichotomous variable. The result of multiple regression analysis on the effect of industry, M&A type, and M&A attribute on changes in ROIC indicate that: 1) Industry type absorbs only eight percent of the variance in ROIC with a p value of more than 30% (see Table 4-22). 2) M&A type absorbs only 0.28% of the variance in ROIC with a

Table 4-24 Multiple Regression Analysis on M&A Attribute with M&A Performance			
M&A Attribute	Multiple Regression on Changes in ROIC		
	Parameter	t	Pr > t
Rescue	-0.00216	-0.02	0.9822
Cooperative	0.01462	0.15	0.8795
Hostile	0.04147	0.38	0.7057
$r^2 = 0.0066$ Adj. $r^2 = -0.0178$ Model p > 0.8457			

Table 4-25 Logistic Regression Analysis on Industry Type with M&A Performance				
Industry		Logistic Regression on Changes in ROIC		
Name	Count	Estimate	Wald χ^2	Pr > χ^2
Money Center	28	-0.0690	0.0022	0.9624
REIT	7	0.2877	0.0320	0.8579
Insurance	4	1.3863	0.5913	0.4419
Health	16	-0.5108	0.1151	0.7344
Business Service	20	0.3677	0.0618	0.8037
Technology	34	-0.2364	0.0264	0.8710
Industrial Goods	8	-0.5108	0.1030	0.7483
Basic Material	8	1.2528	0.5938	0.4409
Consumer Goods	6	0.0000	0.0000	1.0000
Others	2	-14.2029	0.0003	0.9868
$r^2 = 0.1151$ Max-rescaled $r^2 = 0.1151$ Model p (score) > 0.4897 Firms in the others category are from: Conglomerate and Utility industries				

p-value of more than 95% (see Table 4-23). 3) M&A attribute absorbs only 0.66% of the variance in ROIC with a p value of more than 84% (see Table 4-24). The result of the multiple regression suggests that, for this study, these demographic variables do not contribute significantly to the performance of M&A.

Since the dependent variable, ROIC, is used to determine success or failure of an M&A transaction, categorizing an M&A transaction as a success or failure may yield a better result. The ROIC is then converted to success if ROIC is greater than zero and failure if ROIC is less than zero. However, the results of logistic regression provided only a minor change in the percentage of variance absorbed. Industry type absorbed 11%

Table 4-26 Logistic Regression Analysis on M&A Type with M&A Success/Failure			
M&A Type	Logistic Regression (+ or - for Changes in ROIC)		
	Estimate	Wald χ^2	Pr > χ^2
Horizontal Acquisition	-0.1953	0.2077	0.6486
Vertical Integration	-0.1382	0.0335	0.8547
Conglomerate	-0.2923	0.4954	0.4815
$r^2 = 0.0038$ Max-rescaled $r^2 = 0.0051$ Model p (score) > 0.9111			

Table 4-27 Logistic Regression Analysis on M&A Attribute with M&A Success/Failure			
M&A Attribute	Logistic Regression (+ or - for Changes in ROIC)		
	Estimate	Wald χ^2	Pr > χ^2
Rescue	0.0000	0.0000	1.0000
Cooperative	0.0500	0.0012	0.9721
Hostile	-0.6930	0.1747	0.6760
$r^2 = 0.0052$ Max-rescaled $r^2 = 0.0069$ Model p (score) > 0.7167			

of the ROIC variance, with a p-value of about 28% (Table 4-25). M&A type absorbed 0.38% of the ROIC variance with a p-value of more than 91% (Table 4-26). Finally, M&A attribute absorbed 0.52% of the variance with a p-value of more than 71% (Table 4-27). While this is consistent with the result of the multiple regression analysis, it still begs the question of whether these demographic variables can assist in determining a successful M&A transaction or predicting a potential failed acquisition.

Since the various regression analyses suggested that only a minor portion of the variance was explained by the control variables, discriminant analysis was used to check if the control variables could allow one to predict the successfulness of an M&A based on just these demographic variables. Unlike multiple regression and logistic regression, discriminant analysis may not be able to lower its error rate as one adds more variables into the analysis. The selection of the demographic variables becomes important especially for M&A experience as it is measured by two demographic variables, three

years of M&A experience and five years of M&A experience. While the five years of acquisition experience has a larger range, one can argue that the more recent acquisitions would provide a better indication of the skills from the management teams. The discriminant analysis will then use the following variables: relative size, three years of M&A experience, all ten industry types, M&A type, and M&A attribute. The result of the discriminant analysis indicates that the error rate is more than 35%, a very high error rate (see Table 4-28). The analysis further reinforced the conclusion that the demographic variables in this study did not contribute significantly to the M&A performance. There are three possible reasons for the lack of explanatory power by the demographic variables in this study: performance measure problems, data collection problems, and conceptual problems.

The literature is heavily focused on using stock prices and event analysis technique. This study departed from that tradition and focused on changes in financial ratio as a way to determine performance. Additionally, the performance of M&A as measured by stock prices are centered around an M&A announcement, whereas this study focused on the period after integration had begun. As mentioned earlier, measuring the movement of stock prices during the M&A announcement is only a prediction. One can argue that changes in stock prices may be just the analysts' and public reaction to the information contained within the announcement. As more information about the progress of the M&A becomes available, stock prices will change again. There will be a need to compare the two ways to measure the performance of M&A and see which methodology is better.

Table 4-28 Discriminant Analysis on Demographic Variables with M&A Success/Failure					
Variable	Linear Discriminant Function		Univariate Test Statistics		
	Failure	Success	r^2	F	p > F
Three Years M&A Experience	0.0079	-0.0389	0.0002	0.03	0.8581
Relative Size	-2.4083	-4.9876	0.0180	2.42	0.1223
Horizontal Acquisition	-0.3794	-0.2400	0.0007	0.09	0.7691
Vertical Integration	-6.0119	-5.8977	0.0000	0.00	0.9656
Conglomerate	-0.5340	-0.5060	0.0016	0.21	0.6486
Rescue	102.0260	101.3593	0.0000	0.00	0.9664
Cooperative	102.1037	101.2910	0.0010	0.13	0.7147
Hostile	101.5872	102.2716	0.0048	0.63	0.4286
Money Center	135.4659	133.6609	0.0008	0.11	0.7390
REIT	170.8933	167.9334	0.0057	0.75	0.3865
Insurance	139.1199	135.8084	0.0147	1.96	0.1634
Health	134.3566	132.9795	0.0128	1.71	0.1934
Bus. Service	136.2129	133.9764	0.0076	1.01	0.3164
Technology	135.5087	133.9360	0.0038	0.50	0.4791
Industry G.	134.7034	133.3234	0.0035	0.46	0.4966
Basic Material	136.6018	133.0864	0.0234	3.17	0.0774
Consumer Goods	135.0614	132.8617	0.0000	0.00	0.9704
Others	135.4188	135.8583	0.0147	1.97	0.1628
Resubstitution Summary using Linear Discriminant Function					
M&A Classified as	Number of Observations and Percent Classified				
	Failure	Success	Total		
Failure	Count = 35 Percent = 53.03%	31 46.97%	66 100%		
Success	19 27.94%	49 72.06%	68 100%		
Total	54 40.30%	80 59.70%	134 100%		
Priors	49.254%	50.746%			
Error Count Estimate for Success/Failure					
	Failure	Success	Total		
Rate	46.97%	27.94%	37.31%		
Priors	49.25%	50.75%			
Firms in the others category are from: Conglomerate and Utility industries					

Another possible explanation of why demographic variables did not contribute significantly to the performance of M&A may be related to how the data are collected.

That is, there may be some bias in the data collection. For example, if the acquirer had

multiple M&As during the data collection period, March 2003 to January 2005, the survey requested the respondent to address the largest target. The largest target was selected because the larger the target, the more likely that progress of integration will be observed from the financial reports. There exists the possibility, however, that the performance of the firm could have been influenced by multiple smaller M&As, which could confound the performance data. Secondly, the M&A experience was determined with the same process as the actual M&A selection for the survey. This effectively eliminated many other M&As that the acquirer may have had, such as those acquisitions where the purchasing price was not disclosed, acquisitions where the target was from another country, or even minority stake purchases of the same target over an extended period. This would bias the experience for many serial acquirers to a lower number.

Another likely explanation for why the demographic variables did not explain a large amount of the variance in M&A performance is that the prior analysis on how M&A may be successful due to these factors is overly simplistic. There may be other variables or factors that can mediate or intervene with the performance of M&A. For example, a company may under perform with the current acquisition because of external factors or changes in the management team. External factors such as a slow down for the particular industry can reduce the performance of the firm. The low interest rate during the past three years may have affected how the company allocated capital resources and changed the ROIC in ways that one could not anticipate. Changes in the management team may have caused a change in how a firm handled a new business unit. If the acquirer gained executives who were successful at integrating business units in another firm, the overall performance of the acquirer could improve. Similarly, if the acquirer

lost an executive in its integration team, that could have reduced the overall performance of the acquirer. What is important may not have been the experience of the firm on acquisitions, but the experience of its executives who are responsible for the integration of business units.

Section 4.4 Summary Discussion

Figure 4-1 summarizes the data analysis showing which hypotheses were supported in this study, which hypotheses had partial support from the data, and which hypotheses had inconclusive results. From the data analysis, one may make the following general conclusions:

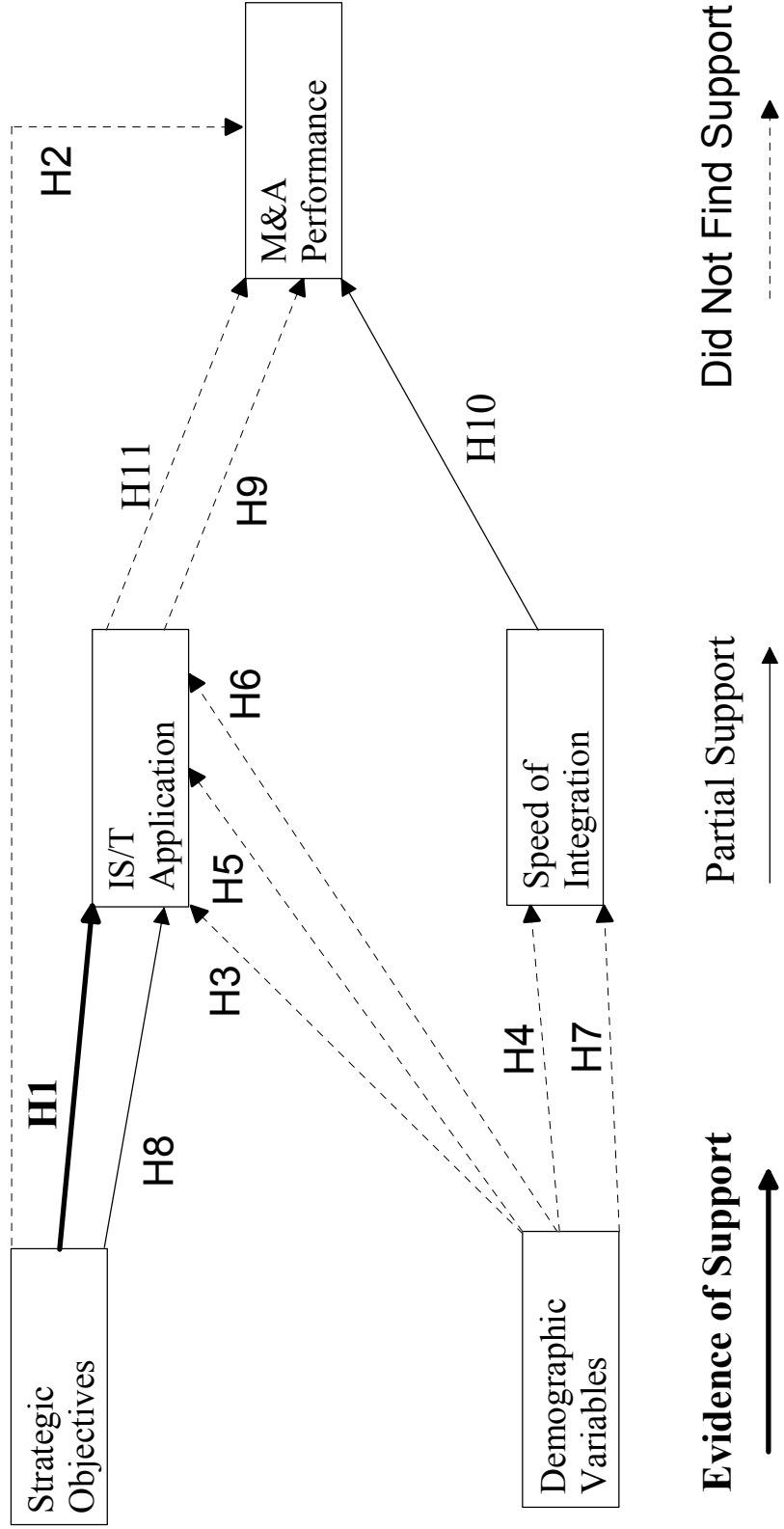
- IS/T resources were used in alignment with the strategic objectives of the M&A. Hypotheses one and eight both suggested that IS/T resources were used in alignment with the strategic objectives of the acquisition. The result confirmed the claim that IS/T objective and performance were linked with the overall goals of the company.

- Speed of integration in M&A can affect the performance of M&A.

Hypothesis 10 suggests that speed of integration would be a factor in the performance of M&A if the objective of the firm was to introduce new products. Speed of integration, however, was not a significant factor on M&A performance if the firm intended to pursue efficiency or an increased sales agenda.

- IS/T was not considered as a strategic resource for most companies. Results concerning hypotheses #3, #5, #7, #9, and #11 suggested that IS/T was not considered as a strategic resource for most companies since the IS/T contribution was not associated with the M&A planning, reflected in the M&A performance,

Figure 4-1
Result of Data Analysis for the Proposed Model



or affected by M&A experience. The question of whether IS/T resources could help M&A performance may not be answerable until IS/T resources come to be considered as strategic.

Chapter 5 Limitations and Future Research

This chapter will discuss how the research on the role of IS/T in M&A can be improved, and suggest directions for future study on IS/T in M&A. The limitations and suggestions for improvement are presented first, followed by a list of potential areas of interest for future studies.

Section 5.1 Limitations and Improvements

Limitations of this research will be presented first, followed by possible improvements for future research.

SECTION 5.1.1 LIMITATIONS

There are at least two limitations for this study. One limitation relates to the sample data while the second limitation relates to the use of a survey.

One limitation of this research was that the sample was confined to M&A occurring within a period of a year and four months, from March 2003 to January 2005. This is a very short period of time when compared with the study by Officer (2006) that had nine years of data. The study by Scholten (2005) had two time periods each lasting at least 7 years. The study by Tolmunen and Torstila (2005) covered 20 years of analysis. Given the short period of time in the sample, there might be a problem with generalizing the results of this study to other periods.

The second limitation was the reliance on human respondents. As discussed earlier, attribution theory and empirical data (KPMG, 2001) suggests that there may be a bias towards positive performance and a bias towards assigning cause to others. It would

be much preferred if all the data collected in the study could be from secondary, more objective sources.

SECTION 5.1.2 IMPROVEMENTS

There are at least two potential improvements to suggest for a survey instrument as a result of this study. The first improvement is associated with the order of the questions presented in the survey, specifically the ranking of the strategic objectives. The intention of this survey question was to identify which one of the resource based theory (RBT) objectives would be seen as the most important for an M&A. However, several respondents ranked these strategic objectives by ranking the IS/T contribution. If this question were placed at the level of completion for the strategic objective, the respondent would be more likely to realize the true intention of the survey question.

The second improvement is associated with the wording in the IS/T performance. While this portion of the survey question had been tested and used in prior academic studies, this was the first time it was used for M&A research. Senior management teams apparently had difficulty in understanding the terminology of IS/T. One respondent asked about the meaning of “output” in question 20. Many other respondents simply left this question blank. Several respondents complained that some questions were already answered in a prior item. Other respondents suggested that the instrument be split into two parts with one part concentrating on IS/T issues because the survey was not answerable by a single executive in the firm. There may be a need to reduce the number of items asked in this subsection to increase the response rate as well as lowering the number of no-response items for this subsection. There seems to be a need to provide a short list of definitions for the terms in question 20.

Section 5.2 Future Directions

There are many research studies that could build on the questions raised during the data analysis of this study. With this research as a foundation, there are several areas that future research may investigate: refining the model, RBT, M&A, and IS/T.

SECTION 5.2.1 RESEARCHING THE MODEL

There may be a relationship between the priority of a strategic objective and how quickly it may be completed. As with hypothesis #1, one can argue that if a strategic objective has a high priority, the objective should receive more attention from the firm and thus, the objective will be completed more quickly. Kitching (1967), however, has found that certain type of acquisitions, such as horizontal M&A, are more difficult than other types of acquisitions, such as financial acquisitions. While it is still likely that the priority of the objective can determine the speed of integration, it is moderated by the difficulty or complexity of the objective which is not measured in this study.

With the data from this study, it would seem that the relationship between the priority objectives with the speed of integration is a complex one. One may use hypothesis #8 to argue that strategic objectives relating to increase efficiency and new product introduction uses more time because it is an organizational wide effort. Strategic objectives relating to increase sales and non-RBT may not need to engage the entire firm to complete. Additionally, hypothesis #10 suggests that new product introduction may be more difficult than increase efficiency because it has a larger impact on the M&A performance.

To obtain results that are testable, one will have to distinguish which type of objective has a faster speed of integration, and which type of objective has a slower speed

of integration. In future research studies, one may propose that the four different types of objectives will have a different level of impact on the speed of integration, with the order of non-RBT objectives, increase sales, increase efficiency, and introduce new products.

SECTION 5.2.2 RESEARCHING THE RBT

While this study was not able to confirm RBT hypotheses directly, the M&A research did provide a potential way to test assumptions and validate RBT. The survey instrument should be redesigned to capture the ranking of the various strategic objectives and then compare them with the performance of the firm. To run this test, however, a larger sample size may be needed.

There may be some difficulties in obtaining a sufficiently large sample size for a specified time frame of acquisition. Hence, several survey studies may be needed to fully test if non-RBT objectives do result in a negative M&A performance. Fortunately, the number of M&A in the U.S. has increased in 2004 and 2005. If the research effort continues, one may be able to confirm RBT quickly.

SECTION 5.2.3 RESEARCHING M&A

As discussed in hypothesis #4, M&A attribute and relative size may affect the speed of integration. The post data analysis suggests that issues concerning size, the M&A attribute, and due diligence process as they relate to M&A integration speed, are worth examining with further research with hypotheses suggested from this study. There is a need, however, to quantify the due diligence process to assess its relationship with the speed of integration. This may be more opportunity to expand the body of knowledge in M&A.

SECTION 5.2.4 RESEARCHING IS/T

There are still many unanswered questions relating to how IS/T contributes towards the performance of M&A. One may design additional studies to determine how IS/T contribution is affected by M&A planning and differences between how IS/T resources are used in a firm. Perhaps just the existence of planning may improve the IS/T contribution. If so, a logistic regression analysis used in this study could be used to determine if planning can affect the contribution of IS/T. It should be followed by additional studies trying to verify and clarify the relationship. Additionally, some firms may be using IS/T strategically now, and their performance may be different than those firms that are using IS/T as a tactical tool. If so, one may design studies that investigate how different uses of IS/T may affect the performance of M&A.

Hypothesis 11 suggests that one may investigate if acquiring a target with better IS/T capability will result in better performance of the firm in the long run. This research study will require: 1 - target be similar in size of the acquirer, 2 - acquirer will not acquire more targets for about two years following the acquisition of the target, and 3 - target IS/T is better than the acquirer. Each of these requirements will eliminate a substantial number of M&As by itself. Hence, a better design may be needed to investigate this question.

APPENDIX

Survey: Cover Letters

<GENDER> <FIRST_NAME> <LAST_NAME><TITLE>
<POSITION>
<COMPANY_NAME>
<ADDRESS_1><ADDRESS_2>
<CITY> <STATE> <ZIP>
<DATE>

RE: Survey on Mergers and Acquisitions

Dear <GENDER> <LAST_NAME><TITLE>:

Studies indicate that more than half of all mergers and acquisitions (M&A) fail. As a Ph.D. candidate studying at Baruch College, CUNY, I am trying to find ways to improve the success rate of M&A through better use of information systems / information technologies (IS/T).

Please help this research effort by completing the attached survey; it should take no more than twenty (20) minutes of your time to complete. This study will be conducted in accordance with the standards set by the Institutional Review Board of Baruch College. When filling out the survey you may leave questions blank, but please answer as many questions as you can.

Please return the completed survey in the business reply mail envelope. If you complete and return the postcard, I will send you a copy of the executive summary of the results of this research effort.

Thank you for your cooperation. It is greatly appreciated.

Sincerely yours,

Hung W. Chu
Ph.D. Candidate

<GENDER> <FIRST_NAME> <LAST_NAME><TITLE>
<POSITION>
<COMPANY_NAME>
<ADDRESS_1><ADDRESS_2>
<CITY> <STATE> <ZIP>
<DATE>

RE: Reminder for survey on Mergers and Acquisitions

Dear <GENDER> <LAST_NAME><TITLE>:

Studies indicate that fewer than half of all mergers and acquisitions (M&A) succeed. We contacted you because of your knowledge in this subject since your organization has completed a M&A in the past two years. About two weeks ago, you were asked to participate in a survey study. If you have responded to the survey, thank you very much and an executive summary of the research findings will be mailed to you in a couple of months. If you are interested in obtaining the executive summary but have not responded to the survey yet, then I urge you to complete the survey.

Your input will be extremely valuable in developing techniques and strategies for the most effective use of information systems / information technologies (IS/T) in M&A activities. We are seeking answers to the following questions:

- How should IS/T be integrated with different M&A objectives?
- Where IS/T should be used to deliver the best performance for M&A?
- What roles IS/T should take to improve the performance of the M&A for the firm?

If you cannot locate this survey, but are interested in reading the result, another survey will be mailed to you within two weeks. As a token of my appreciation, I will donate \$2 in your name to one of three charities, Feed the Children, The Salvation Army or American Cancer Society, if you complete the survey.

Again, your assistance is greatly appreciated. Thank you for your cooperation. I look forward to receiving the completed survey.

Sincerely yours,

Hung W. Chu
Ph.D. candidate

<GENDER> <FIRST_NAME> <LAST_NAME><TITLE>
<POSITION>
<COMPANY_NAME>
<ADDRESS_1><ADDRESS_2>
<CITY> <STATE> <ZIP>
<DATE>

RE: Survey on Mergers and Acquisitions, follow-up request

Dear <GENDER> <LAST_NAME><TITLE>:

Studies indicate that fewer than half of all mergers and acquisitions (M&A) succeed. We contacted you because of your knowledge in this subject since your organization has completed a M&A in the past two years. Four weeks ago, you were asked to participate in a survey. If you have responded to the survey, thank you very much and an executive summary of the research findings will be mailed to you in a couple of months. I understand that your time is valuable and limited. If you are unable to respond to this survey yourself, please ask a knowledgeable member of your management team to complete it.

Your input will be extremely valuable in developing techniques and strategies for the most effective use of information systems / information technologies (IS/T) in M&A activities. We are seeking answers to the following questions:

- How should IS/T be integrated with different M&A objectives?
- Where IS/T should be used to deliver the best performance for M&A?
- What roles IS/T should take to improve the performance of the M&A for the firm?

For your convenience a self addressed business reply envelope has been enclosed for returning the completed survey. Each respondent will be provided with a copy of our research findings and executive summary.

Your assistance is greatly appreciated. Thank you for your cooperation. I look forward to receiving the completed survey.

Sincerely yours,

Hung W. Chu
Ph.D. candidate

Survey: Questionnaire

***Role of Information Systems/Technologies in
Mergers & Acquisition***

=====
Department of Management
Zicklin School of Business
Baruch College
17 Lexington Avenue, Box 9-240
New York, NY 10010
=====

=====
Deliverables

A customized analysis that evaluates the effectiveness of the use of information systems and information technologies in your merger and acquisition (M&A) environment

A documented technique that you can use to improve the performance of your merger and acquisition transactions

All data will be kept strictly CONFIDENTIAL.

Please complete and return the survey to Mr. Hung Chu, Ph.D. candidate, in the pre-addressed envelope.

Voice: (718) 862-7135, Hung_Chu@baruch.cuny.edu

As a token of our appreciation, we will donate \$2 to the charity of your choice:

Feed the Children **Salvation Army** **American Cancer Society**

Should you decide not to participate, we would still appreciate you faxing this page back to (646) 312-3621 with your reasons:

Company Policy **No Time (*needs just 20 minutes*)** **Not interested in M&A**

Please answer all questions by focusing on the following M&A that occurred in your company:

Target 1 (MM/YY Completed)

Other: Please indicate any other M&A that was completed between 4/2003 and 10/2004

Target Name: _____ Completed on Date: _____

Section I: Company Background and Demographics

1. What is your job title in the company (please check all that apply)?

- CEO
- CFO
- CIO
- COO
- Exec. VP
- Sr. VP
- VP

2. What is your job function in the company (please check all that apply)?

- Administration
- Business Development
- Human Resources
- Information Systems/Information Technologies
- Operations
- Strategic Planning

3. Please indicate how many years you have been with this company:

- Less than 1 year
- 1 to 3 years
- 3 to 5 years
- 5 to 10 years
- More than 10 years

4. Please indicate the number of years you have worked in information systems/technologies (IS/T):

- Less than 1 year or none
- 1 to 3 years
- 3 to 5 years
- 5 to 10 years
- More than 10 years

Section II: M&A Background and Demographics

5. **Is this transaction purely a fixed asset or financial transaction?**
- Yes
 - No
6. **Was the target firm a current or potential competitor?**
- Yes
 - No
7. **Was the target firm a part of your supply/distribution chain (upstream/downstream)?**
- Yes
 - No
8. **Did the target firm initiate this M&A?**
- Yes
 - No
9. **Did the target firm resist this M&A?**
- Yes
 - No
10. **Please indicate when IS/T officer started to get involved in the M&A activity?**
- IS/T professional was not involved.
 - At strategic assessment meeting.
 - At target selection meeting.
 - At target valuation meeting.
 - During negotiation with the target firm.
 - During integration planning meeting.
 - During post-M&A integration.
11. **Was there a formal (written) plan for the post-M&A integration process?**
- Yes
 - No (please skip question 12)
12. **Was IS/T integration specified in the post-M&A integration plan?**
- Yes
 - No
13. **Was there a task force responsible for the post-M&A integration?**
- Yes
 - No

Section III: Objectives of This M&A

14. Please indicate the priority level for the following list of objectives for the M&A. Additionally, please indicate the level of completion for each objective.

<i>Objectives</i>	Part I: Objective Priority					Part II: Completion Level						
	n/a	very high priority			very low priority	n/a	is completed			not yet started		
Access to supplier	0	1	2	3	4	5	0	1	2	3	4	5
Access to distributor	0	1	2	3	4	5	0	1	2	3	4	5
Allow entry into new industry	0	1	2	3	4	5	0	1	2	3	4	5
Create new services for the combined firm	0	1	2	3	4	5	0	1	2	3	4	5
Diversify financial risk	0	1	2	3	4	5	0	1	2	3	4	5
Enhance product line	0	1	2	3	4	5	0	1	2	3	4	5
Expand customer base to new market segment	0	1	2	3	4	5	0	1	2	3	4	5
Gaining market power	0	1	2	3	4	5	0	1	2	3	4	5
Leverage skills/patents through integrating product development	0	1	2	3	4	5	0	1	2	3	4	5
Market share growth in existing market segment	0	1	2	3	4	5	0	1	2	3	4	5
Opportunity to achieve higher economy of scale	0	1	2	3	4	5	0	1	2	3	4	5
Opportunity to achieve higher economy of scope	0	1	2	3	4	5	0	1	2	3	4	5
Opportunity to cross-sell products	0	1	2	3	4	5	0	1	2	3	4	5
Opportunity to buy asset at a low price	0	1	2	3	4	5	0	1	2	3	4	5
Prevent competitor from acquiring target	0	1	2	3	4	5	0	1	2	3	4	5
Reduce industry capacity	0	1	2	3	4	5	0	1	2	3	4	5
Reduction in the number of employee	0	1	2	3	4	5	0	1	2	3	4	5
Reduction of duplicate and/or non-core operations	0	1	2	3	4	5	0	1	2	3	4	5
Turn around a failing target	0	1	2	3	4	5	0	1	2	3	4	5
Others: Please Specify _____	0	1	2	3	4	5	0	1	2	3	4	5

15. Please indicate whether IS/T has contributed to the completion of objectives listed. Additionally, please rank at least the top 10 objectives in the order of importance (1 being the most important and 10 the least important)

<i>Objectives</i>	Part III IS/T contributed to the completion of this objective.									Rank the objectives in the order of importance.
	N/A	Agree			Neutral			Disagree		
Access to supplier	0	1	2	3	4	5	6	7	_____	
Access to distributor	0	1	2	3	4	5	6	7	_____	
Allow entry into new industry	0	1	2	3	4	5	6	7	_____	
Create new services for the combined firm	0	1	2	3	4	5	6	7	_____	
Diversify financial risk	0	1	2	3	4	5	6	7	_____	
Enhance product line	0	1	2	3	4	5	6	7	_____	
Expand customer base to new market segment	0	1	2	3	4	5	6	7	_____	
Gaining market power	0	1	2	3	4	5	6	7	_____	
Leverage skills/patents through integrating product development	0	1	2	3	4	5	6	7	_____	
Market share growth in existing market segment	0	1	2	3	4	5	6	7	_____	
Opportunity to achieve higher economy of scale	0	1	2	3	4	5	6	7	_____	
Opportunity to achieve higher economy of scope	0	1	2	3	4	5	6	7	_____	
Opportunity to cross-sell products	0	1	2	3	4	5	6	7	_____	
Opportunity to buy asset at a low price	0	1	2	3	4	5	6	7	_____	
Prevent competitor from acquiring target	0	1	2	3	4	5	6	7	_____	
Reduce industry capacity	0	1	2	3	4	5	6	7	_____	
Reduction in the number of employee	0	1	2	3	4	5	6	7	_____	
Reduction of duplicate and/or non-core operations	0	1	2	3	4	5	6	7	_____	
Turn around a failing target	0	1	2	3	4	5	6	7	_____	
Others: Please Specify _____	0	1	2	3	4	5	6	7	_____	

Section IV: The Role of IS/T

16. Please select the statement that best describes the resource of IS/T in the new company.

- IS/T resource is primarily viewed as a necessary expense to run our business.
- IS/T resource is primarily used to achieve productivity objectives.
- IS/T resource is primarily used in new product development.
- IS/T resource is primarily used to give us a competitive advantage against our competitors.

17. Please indicate the integration procedure for the following IS/T components (please select one item per row):

<i>IS/T Integration Technique</i>	Kept All Acquirer Systems	Kept All Target Systems	Kept Both Systems	Kept the Best of Acquirer or Target Systems	Developed New Systems	Bought New Systems	Other, Please Specify Below
Computers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Operating Systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Application Software	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Database Systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internet Services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Others: Please Specify _____

Section V: Organization Performance

18. Since the M&A, revenue from the target company, in your opinion:

- is more than 15% above expectation
- is 5% to 15% above expectation
- is within expectation (or within 5% of expected revenue)
- is 5% to 15% below expectation
- is more than 15% below expectation

19. Since the M&A, the revenue of the acquiring company, in your opinion:

- is more than 15% above expectation
- is 5% to 15% above expectation
- is within expectation (or within 5% of expected revenue)
- is 5% to 15% below expectation
- is more than 15% below expectation

20. Please respond to the following IS/T questions by relating to the M&A

<i>Question</i>	IS/T from the Acquirer						IS/T from the Target					
	n/a	Never	Neutral	Always	n/a	Never	Neutral	Always	n/a	Never	Neutral	Always
Are you satisfied with the accuracy of the IS/T in this M&A?	0	1	2	3	4	5	0	1	2	3	4	5
Are you happy with the layout of the output for this M&A?	0	1	2	3	4	5	0	1	2	3	4	5
Do you find the output relevant to this M&A?	0	1	2	3	4	5	0	1	2	3	4	5
Do you feel the output is reliable for this M&A?	0	1	2	3	4	5	0	1	2	3	4	5
Do you find the IS/T dependable for this M&A?	0	1	2	3	4	5	0	1	2	3	4	5
Do you think the output is presented in a useful format for this M&A?	0	1	2	3	4	5	0	1	2	3	4	5
Does the IS/T provide the precise M&A information you needed?	0	1	2	3	4	5	0	1	2	3	4	5
Does the information content meet your needs in this M&A?	0	1	2	3	4	5	0	1	2	3	4	5
Does the IS/T provide M&A reports that seem to be just about exactly what you need?	0	1	2	3	4	5	0	1	2	3	4	5
Does the IS/T provide sufficient information on this M&A?	0	1	2	3	4	5	0	1	2	3	4	5
Does the IS/T provide up-to-date information for this M&A?	0	1	2	3	4	5	0	1	2	3	4	5
Have you received the information that you need in time, for this M&A?	0	1	2	3	4	5	0	1	2	3	4	5
Is the IS/T accurate for this M&A?	0	1	2	3	4	5	0	1	2	3	4	5
Is the M&A information clear?	0	1	2	3	4	5	0	1	2	3	4	5
Is the output for the M&A easy to understand?	0	1	2	3	4	5	0	1	2	3	4	5
Is the IS/T, as it relates to M&A, user friendly?	0	1	2	3	4	5	0	1	2	3	4	5
Is the IS/T efficient for this M&A activity?	0	1	2	3	4	5	0	1	2	3	4	5
Is the IS/T on this M&A easy to use?	0	1	2	3	4	5	0	1	2	3	4	5

21. In my opinion, I would say the performance of this M&A:

- exceeds expectation.
- meets expectation.
- partially meets expectation.
- has not yet met expectation.

Thank you for your time and cooperation. Please return the survey in the self-addressed envelope.

Glossary

Abnormal Return The difference between actual return and the benchmark return (Sudarsanam, 1995). Others have defined this term as the part of return that is not predicted by factors such as the market (Gaughan, 1996).

Acculturation Theory Changes induced in two cultural systems as a result of the diffusion of cultural elements in both directions (Berry, 1980, p 215).

Acquiring Firm The buyer in a merger and acquisition transaction. This is the firm that was successful in obtaining the target firm. There is only one acquiring firm, whereas there can be many bidder firms.

Acquisition An act of purchasing controlling interest in a company. Often the purchase is for full ownership. In a technical sense, acquisition means transfer of the ownership of some asset from one firm to another.

Agency Problem The conflict of interest between principal (e.g., shareholders) and agent (e.g., managers) in which the agent has an incentive to act in his own self interest because he bears less than the total cost of his actions (Weston *et al.*, 2001). See Agency Theory.

Agency Theory Recognizes that there is a cost for stockholders to monitor the corporate managers, the agents of stockholders. This is because managers may pursue activities that are not in the best interests of the stockholders.

Anergy Negative synergy. Instead of a “ $2 + 2 = 5$ ” effect, anergy implies “ $2 + 2 = 3$.” Businesses actively interfere with each other and may have more value if separated (Weston *et al.*, 2001).

Antitakeover Amendment A corporate charter amendment that is intended to make takeovers more difficult and/or expensive for an unwanted bidder (Gaughan, 1999).

Announcement Date In event studies, typically, the day information becomes public (Weston *et al.*, 2001). The date the merger or acquisition is announced to the public.

Beta A risk measure derived from the capital asset pricing model. It quantifies the systematic risk of a security (Gaughan, 1999). In the capital asset pricing model this is the systematic risk of the asset; the variability of the asset’s return in relation to the return on the market (Weston *et al.*, 2001).

Bidder Firm In the case of acquisition, this is the firm that is engaging in the purchase of the target firm.

Capital Asset Pricing Model This is a framework for assessing the rate of return that the market expects an asset to earn, given its riskiness. It is a financial model that computes a security's rate of return as a function of risk-free rate and a market premium that is weighted by the security's bet (Gaughan, 1999). This model calculates the required return on an asset as a function of the risk-free rate plus the market risk premium times the asset's beta (Weston *et al.*, 2001).

Celler-Kefauver Act of 1950 An amendment to the Clayton Act that modified Section 7 of that act to make the acquisition of assets of a company, not just the stock, an antitrust violation when the deal has anti-competitive results. This amendment also made "anti-competitive" vertical and conglomerate mergers antitrust violations (Gaughan, 1999).

Clayton Act of 1914 A federal regulation on antitrust. Section 7, which is most relevant to mergers and acquisition, prohibits the acquisition of stock and assets of a company when the effect is to lessen competition.

Completion Date 1. The Legal Completion Date. 2. When the stock reflects the completion of the transaction in the marketplace. 3. When the two companies start to report their financial balance sheet together.

Concentration Measures of the percentage of total industry sales according to a specified number of firms, such as 4, 8, or 20 (Weston *et al.*, 2001).

Concentric Merger A merger in which there is carryover in *specific* management functions (*e.g.*, marketing) or complementary in relative strengths among *specific* management functions rather than carryover/complementary in only generic management functions (*e.g.*, planning) (Weston *et al.*, 2001).

Conglomerate Acquisitions See Diversification.

Corporate Restructuring The use of this term usually refers to asset sell-off or divestitures. A firm may sell off a division that no longer fits into the company's plan after an M&A transaction.

Crown Jewels The most valuable segments of a company; the parts most wanted by an acquirer (Weston *et al.*, 2001).

Cumulative Abnormal Return The sum of daily abnormal returns over a certain period in an event study.

Discounted Cash Flow Valuation (DCF) The application of an appropriate cost of capital to a future stream of cash flows (Weston *et al.*, 2001).

Diversification In mergers and acquisitions, this term refers to the practice of buying companies or assets outside a company's current line of business (Gaughan, 1999). Diversification is more likely to be a financial acquisition, but can include financial synergies as well (Grinblatt and Titman, 1998, p 670).

Divestiture Sale of a segment of a company (assets, a product line, subsidiary) to a third party for cash and/or securities (Weston *et al.*, 2001).

Efficient Market Theory The market value of a firm's stock price reflects an unbiased estimate of all publicly available information about the firm's cash flow and its related risk.

End of Regulation Theory A theory hypothesizing that takeovers occur following deregulation of an industry as a result of increased competition, which exposes management inefficiency that may have been masked by regulation (Weston *et al.*, 2001).

Event Study An empirical test of the effect of an event (*e.g.*, a merger, divestiture) on stock returns. The event is the reference date from which analysis of return is made regardless of the calendar timing of the occurrences in the sample of firms (Weston *et al.*, 2001).

Financial Acquisitions A clarification by the investment bankers where the transaction includes no operating synergies. The acquirer for this type of transaction usually believes that the cost of acquisition is less than the intrinsic value of the firm (Grinblatt and Titman, 1998, p 670).

Financial Synergy A theory that suggests a financial motive for mergers, especially between firms with high internal cash flows (poor investment opportunities) and firms with low internal cash flows (and high investment opportunities which, absent merger, would require costly external financing). Also includes increased debt capacity or co-insurance effect and economies of scale in flotation and transaction costs of securities (Weston *et al.*, 2001). Transactions with financial synergy are expected to reduce the cost of capital (Grinblatt and Titman, 1998, p 670).

Four-Firm Concentration Ratio The sum of the share of sales, value adds, assets, or employees held by the largest four firms in an industry. A measure of competitiveness according to the structural theory (Weston *et al.*, 2001).

Free Cash Flow Cash remaining after all projects on which the returns equal or exceed the cost of capital have been funded.

Free Cash Flow Hypothesis Theory put forward by Michael Jensen which asserts that the assumption of debt to finance leveraged takeovers will absorb discretionary cash flows and help eliminate the agency problem between management and

shareholders. It is assumed that with the higher debt service obligations, management would apply the company's cash flow to activities that are in management's interest and not necessarily in shareholders' interest (Gaughan, 1999).

Gambler's Ruin An adverse string of losses that could lead to bankruptcy, although the long-run cash flow could be positive (Weston *et al.*, 2001).

Game Theory An analysis of the behavior (actions and reactions) of participants under specified rules, information, and strategies (Weston *et al.*, 2001).

Golden Parachute Provision in the employment contracts of top managers providing for compensation for loss of job following a change of control (Weston *et al.*, 2001).

Goodwill The excess of the purchase price paid for a firm over the book value received. Recorded on the acquirer's balance sheet, to be amortized over not more than 40 years (as of 2001, amortization is not tax-deductible). (Weston *et al.*, 2001).

Greenmail An anti-takeover defense where the target buys back its stock from the acquirer at a substantial premium on the condition that the acquirer suspend the acquisition activities (Grinblatt and Titman, 1998, p 699). The premium over the current market price of stock paid to buy back the holding accumulated by an unwanted acquirer to avoid a takeover (Weston *et al.*, 2001).

Hart-Scott-Rodino Antitrust Improvements Act of 1976 A law that requires a bidding company to file with the Federal Trade Commission and the Justice Department and receive antitrust approval from one of these entities before completing a takeover (Gaughan, 1999). This Act expands the power of the Department of Justice in antitrust investigations; it provides for a waiting period (15 days for tender offers, 30 days for mergers) following submission of information to the Department of Justice and Federal Trade Commission before a transaction can be completed; it expands power of state attorneys' general to institute triple damage antitrust lawsuits on behalf of their citizens (Weston *et al.*, 2001).

Herfindahl-Hirshman (HH) Index The sum of the squares of the market shares of companies in a given industry. It is a measure of industry concentration and is more sensitive to the effects of mergers than simple market shares (Gaughan, 1999). The measure of concentration under the 1982 Merger Guidelines, defined as the sum of *squares* of the market shares of *all* the firms in the industry (Weston *et al.*, 2001).

Horizontal Integration A merger of firms selling a similar product or service (Gaughan, 1999).

Horizontal Merger A combination of firms operating in the same business activity (Weston *et al.*, 2001).

Hostile Takeover A tender offer that proceeds even after it has been opposed by the management of the target (Weston *et al.*, 2001).

Hubris Hypothesis A theory by Richard Roll that asserts that managers in acquiring companies believe their valuations of targets may be superior to the market. This hubris causes them to overpay and overestimate the gains from acquisitions (Gaughan, 1999). This is an ironic hypothesis which states that bidders who overestimate the value of a target will most likely win a contest. This is due to the fact that they will be more inclined to overpay and outbid rivals who more accurately value the target (Gaughan, 1999).

Information Asymmetry A game or decision in which one party has more information than other players (Weston *et al.*, 2001).

Information Intensity The amount of intellectual work done by people as they conduct their affairs (Teo *et al.*, 1997).

Internal New Venture A strategic alternative for entering into a new business by building the operation without external assets.

Investment Advisers Act of 1940 Federal securities legislation providing for registration and regulation of investment advisers (Weston *et al.*, 2001).

Investment Company Act of 1940 One of several pieces of federal legislation passed after the October 1929 stock market crash and the Great Depression. This law regulates the activities and reporting requirements of investment companies, which are firms whose principal business is the trading and management of securities (Gaughan, 1999).

Joint Venture Companies jointly pursuing a certain business activity (Gaughan, 1999). A combination of subsets of assets contributed by two (or more) business entities for a specific business purpose and a limited duration. Each of the venture partners continues to exist as a separate firm, and the joint venture represents a new business enterprise (Weston *et al.*, 2001). See Strategic Alliance.

Management Entrenchment Hypothesis Nonparticipating shareholders will experience reduced wealth when management takes actions to deter attempts to take control of the corporation (Gaughan, 1999).

Market Extension Merger A combination of firms whose operations had previously been conducted in non-overlapping geographic areas (Weston *et al.*, 2001).

Market for Corporate Control The arena in which alternative management teams compete for the rights to manage corporate resources.

Merger Any transaction that forms one economic unit from two or more previous units (Weston *et al.*, 2001). An act of combining two organizations into one where both parties have a relatively equal authority. In merger activity, the two entities are often relatively close in size, assets, or sales revenue. A major difference between mergers and acquisitions is that a name different from either of the existing two entities may displace those of the existing entities after the merger. In certain studies, merger simply means the union of two companies.

M&A Type A type of classification where the M&A is categorized into horizontal, vertical, related, or unrelated M&A.

M&A Experience Prior M&A activity from either the acquirer or the target. It may involve just how many M&As occurred in the past period. A more complicated description may involve additional variables such as relative size and M&A type.

M&A Attribute A type of classification where the M&A is categorized by rescue, friendly, contested, or hostile takeover.

Monopoly A market situation in which there is a single manufacturer or provider of some product.

Monopsony A market situation in which there is a single buyer of some product in an industry. This industry structure allows the buyers to force lower prices from the supplier (Lubatkin, 1983).

Morris Trust Using a Morris Trust, a company could spin off a component business that it did not want to keep, while in a second set, pre-planned transaction the spun-off business is merged into an acquirer's business in a tax-free stock transaction. The result is the company shareholders in the selling company end up with shares in both their own company and that of the acquirer (Gaughan, 1999).

Net Present Value (NPV) A capital budgeting technique that combines the present value of cash inflows of a project with the present value of investment outlays (Gaughan, 1999).

Normal Return In event studies, the predicted return if no event took place, and the reference point for the calculation of abnormal or excess return attributable to the event (Weston *et al.*, 2001).

Oligopoly A market with only a small number of sellers (Weston *et al.*, 2001). Industry structure characterized by a small number of sellers -- between 3 and 10.

Operating Synergy Combining two or more entities resulting in a revenue gain or cost reduction because of complementarities or economies of scale or scope (Weston *et al.*, 2001).

Organizational Culture The symbols, values, ideologies, and assumptions which operate -- often in an unconscious way -- to guide and fashion individual and business behavior (Cartwright *et al.*, 1993). An organization's "style" or approach to problem solving, relations with employees, customers, and other stakeholders (Weston *et al.*, 2001).

Organizational Fit The match between administrative practices, cultural practices, and personnel characteristics of the target and acquiring firms; may directly affect how the firms can be integrated with respect to day-to-day operations once an acquisition has been made (Jemison *et al.*, 1986); how the administrative systems, corporate cultures, or personnel characteristics of the acquiring firm match those of the acquired firm (Buck-Lew *et al.*, 1992).

Pac-Man Defense One of the more extreme anti-takeover defenses. It refers to a situation in which a target makes a counteroffer to a bidder (Gaughan, 1999).

Pecuniary Economy A type of synergy achieved by the firm's ability to dictate prices by exerting market power achieved primarily through size (Lubatkin, 1983).

Perfect Competition Set of assumptions for an idealized economic model: 1) Large number of buyers and sellers so none can influence market prices or output; 2) economies of scale exhausted at relatively small size and cost efficiencies are the same for all companies; 3) no significant barriers to entry; 4) constant innovation, new product development; 5) complete knowledge of all aspects of input/output markets is available without cost (Weston *et al.*, 2001).

Poison pill An anti-takeover defense that grants valuable rights to target shareholders who choose not to tender their shares (Grinblatt and Titman, 1998, p 699). A right issued by a corporation as a preventative anti-takeover defense. It allows right holders to purchase shares in either their own company or the combined target and bidder company at a discount, usually 50%. This discount may make the takeover prohibitively expensive (Gaughan, 1999).

Pure Conglomerate Merger A combination of firms in non-related business activities that is neither a product-extension nor a geographic extension merger (Weston *et al.*, 2001).

q-ratio (Tobin's q-ratio) The ratio of the market value of a firm's securities to the replacement costs of its physical assets (Weston *et al.*, 2001).

Restructuring Significant changes in the strategies and policies relating to asset composition and liability and equity patterns as well as operation (Weston *et al.*, 2001).

Restructuring charges Also referred to as big bath write-offs. In a merger context it refers to a company's taking large write-offs following an acquisition, which lowers current income but may carry the implication that future income may be higher (Gaughan, 1999).

Return on Asset (ROA) A profitability ratio that reveals how much profit a company earns for every dollar of its assets. ROA is calculated as:

$$ROA = \frac{\text{Net Income}}{\text{Total Asset}}$$

Return on Equity (ROE) A profitability ratio that tests of how effectively a company's management uses investors' money - ROE shows whether management is growing the company's value at an acceptable rate. ROE is calculated as:

$$ROE = \frac{\text{Net Income}}{\text{Shareholder's Equity}}$$

Return on Invested Capital (ROIC) A profitability ratio that assess a company's potential to be a quality investment by determining how well (i.e.. profitably) a company's management is able to allocate capital into its operations. Total capital includes long term debt, common and preferred shares. The general equation for ROIC is as follows:

$$ROIC = \frac{\text{Net Operating Income}}{\text{Shareholder's Equity} + \text{Long Term Debt}}$$

Reverse mergers The un-combination of firms via spin-offs, divestitures, and so on (Weston *et al.*, 2001).

Reverse synergy $4 - 1 = 5$; where, following a sell-off, the remaining parts of a company are more valuable than the original parent business (Gaughan, 1999).

Roll-up acquisitions An acquisition program that features multiple acquisitions of smaller companies by a larger consolidator (Gaughan, 1999).

Schedule 13D The document that is required by the Williams Act to be filed with the SEC within ten days of acquiring five percent or more of a public company's outstanding shares. This filing discloses certain information, including the purchaser's identity and intention, as well as other related information, such as financing sources, in the case of planned takeover (Gaughan, 1999). Applies to all large stock acquisitions (Weston *et al.*, 2001).

Schedule 14D The document that, pursuant to the Williams Act, must be filed with the SEC by the initiator of a tender offer. This filing discloses information on the

identity of the bidder, specifics of the offer, and other relevant information, such as sources of financing and post-acquisition plans (Gaughan, 1999). A form that must be filed with the SEC by *any* group or individual making solicitations or recommendations that would result in its owning more than five percent of the target's stock. Applies to public tender offers only (Weston *et al.*, 2001).

Securities Act of 1933 The first of the federal securities laws of the 1930s. It provides for the registration of publicly traded securities (Gaughan, 1999).

Securities Exchange Act of 1934 The federal law that established the Securities and Exchange Commission. It also added further regulations for securities markets. The last has been amended several times since its initial passage. One of the amendments that is relevant to mergers is the Williams Act of 1968 (Gaughan, 1999).

Securities Investor Protection Act of 1970 Federal legislation that established the Securities Investor Protection Corporation empowered to supervise the liquidation of bankrupt securities firms and to arrange for payments to their customers (Weston *et al.*, 2001).

Sell-off A general term describing a sale of a part of a company. It also includes other more specific transactions, such as divestitures or spin-offs (Gaughan, 1999).

Sherman Act of 1890 The major piece of federal antitrust legislation. It contains two principal sections: Section 1 prohibits all contracts and combinations in restraint of trade; Section 2 prohibits monopolization and attempts at monopolization (Gaughan, 1999).

Spin-off A type of sell-off in which a parent company distributes shares on a *pro rata* basis to its shareholders. These new shares give shareholders ownership rights in a division or part of the parent company that is sold off (Gaughan, 1999).

Split-off A type of sell-off in which shareholders of a parent company exchange their shares in the parent company for shares in the sold off entity (Gaughan, 1999).

Staggered Board Term An anti-takeover defense usually used in conjunction with supermajority rule. This defense can keep the acquirer from taking over the target, even if the acquirer obtains more than 50% of the target's shares. (Grinblatt and Titman, 1998, p. 699). Also called a classified board. An anti-takover measure that divides a firm's board of directors into several classes, only one of which is up for election in any given year, thus delaying effective transfer of control to a new owner in a takeover (Weston *et al.*, 2001).

Stakeholders Any entity that is affected by the actions of a company, which includes shareholders, management, workers, communities, consumers, suppliers, and so on (Gaughan, 1999).

Standard Industrial Classification (SIC) The Census Bureau's system of categorizing industry groups, mainly product- or process-oriented (Weston *et al.*, 2001).

Strategic Acquisitions Operating synergies where two firms are expected to be more profitable combined than separated (Grinblatt and Titman, 1998, p 669).

Strategic Alliance A more flexible alternative to a joint venture whereby certain companies agree to pursue certain common activities and interests (Gaughan, 1999). A strategic alternative for entering into a new business by signing an agreement with a party who has similar interests in order to share various types of resources. In the case where a new organization is to be created, it is often called joint venture.

Strategic Fit The degree to which the target firm augments or complements the acquiring firm's strategy and thus makes identifiable contributions to the financial and non-financial goals of the parent company (Jemison *et al.*, 1986) and reflects the extent to which the acquired firm can contribute to, augment, or complement the strategy of the acquiring firm (Buck-Lew *et al.*, 1992).

Supermajority Rule An anti-takeover defense usually used in conjunction with Staggered Board Term. This defense can keep the acquirer from taking over the target even if the acquirer obtains more than 50% of the target's shares (Grinblatt and Titman, 1998, p 699).

Synergy $2 + 2 = 5$; a combination of businesses in which the combined entity is more valuable than the sum of the parts.

Take-out Merger The second-step transaction that merges the acquired firm into the acquirer and thus "takes out" the remaining target shares that were not purchased in the initial (partial) tender offer (Weston *et al.*, 2001).

Takeover A special form of acquisition where the target firm did not solicit action from the acquiring firm.

Target Firm The company being absorbed or integrated into another firm in a merger and acquisition transaction. The literature often uses the term "acquired firm" as a way to indicate that the transaction is complete and the target firm is no longer a legal entity.

Tender Offer An offer made directly to shareholders. One of the more common ways hostile takeovers are implemented (Gaughan, 1999).

Tobin's q The ratio of the current market value of the firm's securities to the current replacement cost of its assets; used as a measure of management performance (Weston *et al.*, 2001).

Transaction It can mean either a merger or an acquisition when discussing M&A.

Type A, B, C reorganization Forms of tax-free reorganizations. Type A: Statutory mergers (target merged into acquirer) and consolidations (new entity created). Type B: Stock-for-stock transactions in which target is liquidated into the acquirer or maintained as separate operating entity. Type C: Stock-for-asset transaction in which at least 80% of fair market value of target's property is acquired; the target is then dissolved (Weston *et al.*, 2001).

Vertical Merger A merger of companies that operate at different levels or stages of the production process in the same industry. For example, a company with large oil reserves buying a pipeline company for a gasoline retailer is an example of forward integration. A consumer electronics retail chain that buys a brand name manufacturer would be an example of backward integration (Gaughan, 1999).

White Knight A more acceptable buyer that a target of a hostile bid may approach (Gaughan, 1999).

White Squire A friendly company or investor that purchases an interest in the target of a hostile bid. The target may do this to make a takeover more difficult (Gaughan, 1999).

Williams Act of 1968 An amendment of the Securities and Exchange Act of 1934 that regulates tender offers and other takeover-related actions, such as larger share purchases (Gaughan, 1999).

Winner's curse See Hubris hypothesis.

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