DETERMINANTS OF SUCCESSFUL ACQUISITIONS: THE CASE OF CISCO

by

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ABSTRACT

Cisco has become the largest internetworking supplier in the world. The company's acquisition strategy has been a key contributor to the company's growth. The objective of this research was to develop a set of hypotheses that relate acquisition strategy with performance and test these hypotheses using data on the 79 acquisitions Cisco made during the 1993-2003 period. Results show that three dimensions of Cisco's acquisition strategy contribute to its acquisition success: high fit between Cisco's culture and the acquired company's culture, high retention rate of the employees of the acquired company, and size of the acquired company. Author's results also show that the National Association of Securities Dealers Automatic Quotation System (NASDAQ) index affects Cisco's acquisition strategy. This research study expands the literature on mergers and acquisitions.

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1. INTRODUCTION

The objectives of this research were to:

- Develop a set of hypotheses anchored around a research model that related acquisition strategy with acquisition success
- Test the hypotheses using data on the 79 acquisitions made by Cisco Systems Inc. from January 1993 to May 2003

The model developed in this thesis builds on the structure used in Ferrier's model for competitive aggressiveness (Ferrier 2001), the academic literature on mergers and acquisitions, and the professional literature focused on Cisco's acquisitions.

Four dimensions were used to characterize Cisco's acquisition strategy: the distance between the location of Cisco's main facility closest to the acquisition and the location of the acquired company, the size of the acquired company, the rate of retention of the acquired company's employees, and the fit between Cisco's culture and the culture of the acquired company.

Two exogenous factors, acquisition experience and stock market index, are conceptualized to affect acquisition strategy. These factors constrain and enable the four dimensions of acquisition strategy.

Companies acquire other companies to grow, reduce time to market, and add teams with unique talents. Since the early 1990s, acquisition activity has increased significantly

(Ranft and Lord 2002), especially in the high-tech industry. While the number of acquisitions has increased significantly, many report that the majority of mergers and acquisitions have delivered disappointing results that have negatively impacted shareholder returns (Kratowill 1999). Cisco Systems, however, has a remarkable successful acquisition record and has set the benchmark of acquisition practices in technology based companies. Here lies the reason for the relevance of this research study. It focuses on the acquisition practices of one of the most successful companies in the world.

The findings in this thesis offer insights to the top management teams in large firms who plan to acquire small technology companies.

This research is the first empirical study that examines the acquisition strategy of one company that has made a large number of acquisitions over a 10-year period. The findings of this thesis expand the literature on mergers and acquisitions.

The remainder of this thesis has been arranged into seven chapters. Chapter 1 is the introduction. Chapter 2 provides the results of the literature review and lessons learned from it. Chapter 3 develops the research model used in the thesis and six sets of 12 hypotheses. Chapter 4 describes the methodology used in this research. Chapter 5 provides the results of testing the hypotheses and Chapter 6 discusses the results. Finally, Chapter 7 presents the conclusions, limitations and suggestions for future research.

2. LITERATURE REVIEW

The purpose of the literature review was twofold:

- Identify the dimensions of acquisition strategy that affect acquisition success
- Identify the firm-level factors and market-level factors that affect the dimensions of acquisition strategy

This chapter is organized into four parts. The first part identifies the firm-level and market-level factors that affect dimensions of acquisition strategy. The second part identifies the dimensions of acquisition strategy that affect acquisition success. The third part examines how to measure acquisition success. The final part identifies the key lessons learned from reviewing the literature.

In each section, the author separates the academic literature from the professional literature.

2.1 Firm-level and Market-level Factors

Firm-level and market level factors affect competitive aggressiveness (Ferrier 2001). Acquisition is one of the most important strategic actions of competitive aggressiveness (Miller & Chen 1994).

Tables 1 and 2 identify the studies that have identified firm-level and market-level factors that affect a company's competitive strategy. The $\rightarrow$ is used to identify a relationship. $X \rightarrow Y$ means "X affects Y."

Table 1 includes references found in the academic literature, while Table 2 includes references found in the professional literature.

Table 1: Firm-level and Market-level Factors that Affect Acquisition Strategy Identified in the Academic Literature

Study	Proposition	Rationale
Ahuja and Katila (2001)	Acquisition experience $\rightarrow$ acquisition strategy	Acquirer's experience helps to build knowledge about acquisitions
Bruton, Oviatt and White (1994)	Acquisition experience $\rightarrow$ acquisition strategy	Experienced acquirer knows more about key success factors
Hayward (2002)	Acquisition experience $\rightarrow$ acquisition strategy	A firm's acquisition experience helps select the right company to acquire
Hitt (1993)	Acquisition experience $\rightarrow$ acquisition strategy	Acquirer's experience leads to effective integration processes
Jovanovic and Rousseau (2001)	Market evaluations $\rightarrow$ acquisition strategy	High acquisition activity correlates with high market valuations, acquirers are more likely to use stock rather than cash to acquire companies
Kotzen, Neenan, Roos and Stelter (2003)	Economy $\rightarrow$ acquisition strategy	Acquirers in weak-economy periods behave differently than in strong-economic periods; during weak economic periods acquirers focus more on business fundamentals and evidence of potential synergies
Nelson (1959)	Stock market level $\rightarrow$ acquisition strategy	Merger activity increases when the stock market level is high
Rau and Vermaelen (1998)	Stock market level $\rightarrow$ acquisition strategy	The stock market over-extrapolates positive past performance when assessing acquisitions, the management overestimates its own abilities

**Table 2: Firm-level and Market-level Factors that Affect Acquisition Strategy
Identified in the Professional Literature**

Study	Proposition	Rationale
Garud and Karnoe (2001)	Acquisition experience → acquisition strategy	Acquisition strategy evolved in a path dependent manner and the early acquisitions were critical for creating the future path
Mayer (2002)	Acquisition experience → acquisition strategy	Early successes created a virtuous circle encouraging the firm to undertake yet further acquisitions
McJunkin and Rynders (2000)	Acquisition experience → acquisition strategy	We made every mistake in the book, but we learned from these mistakes, and they have helped us in subsequent transactions
Mayer (2002)	Stock market level → acquisition strategy	The dramatic acceleration in pace of acquisitions from 1998 to 2000 overloaded the ability to undertake adequate due diligence In 1999 and 2000 the labour market was torrid making job-hopping pervasive

2.1.1 Acquisition Experience

Academic literature

Acquisition experience is a principal mechanism by which a company attains the skills required to: i. identify attractive companies to acquire and ii. operate acquired companies. Bruton et al. (1994) argued that experienced acquirers know more than inexperienced acquirers about the key acquisition-related success factors.

Experiences learned from prior acquisitions will help firms to better select the right acquisition (Hayward 2002). Acquisition experience allows firms to learn how to become more efficient at defining the acquisition strategy and overcoming integration problems.

Acquisition experience improves the effectiveness of the integration process (Hitt 1993) and the rapidity of combining the skills and knowledge of two firms (Ahuja and Katila 2001).

Professional literature

Cisco's acquisition and integration strategy evolved in a path dependent manner. The early acquisitions were critical for creating the future path (Garud and Karnoe 2001). Early successes created a virtuous circle encouraging the firm to undertake yet further acquisitions (Mayer 2002). Mike Volpi, VP of Business Development of Cisco Systems, stated "We made every mistake in the book, but we learned from these mistakes, and they have helped us in subsequent transactions" (McJunkin and Rynders 2000).

In late 1997, Cisco's acquisition strategy and integration process had been established and used to guide subsequent acquisitions (Rifkin 1997).

2.1.2 Market Index

Academic literature

Environmental factors affect acquisitions. It was noted that merger activity increases when stock prices are high (Nelson 1959). Jovanovic and Rousseau's study (2001) supports this finding and concludes that acquirers use stock rather than cash to undertake acquisitions during periods of high stock prices.

Acquirers during a weak-economy behave differently than when they behave from during a strong economy. During a weak economy they focus more on business fundamentals and true potential synergies (Kotzen et al. 2003). During growth periods, management tends to overestimate its own abilities and does not perform proper due diligence.

Professional literature

During the growth in telecommunications period of 1999 and most of 2000, the demand for experienced employees in the data communication equipment industry was very high. This encouraged job-hopping, which resulted in very high employee turnover (Mayer 2002).

During the telecommunications bubble, stock prices increased quickly. This motivated the acquisition of firms with cultures that did not fit well with Cisco's culture (Byrne and Elgin 2002).

2.2 Acquisition Strategy and Acquisition Success

Competitive aggressiveness affects company performance (Ferrier 2001). Table 3 and 4 identify the studies that examine the dimensions of acquisition strategy and how acquisition strategy affects acquisition success. Table 3 includes the references from the academic literature and Table 4 includes the references from the professional literature.

Table 3: Studies Focused on the Effect of Acquisition Strategy on Acquisition Success Identified in the Academic Literature

Study	Proposition	Rationale
Larsson and Finkelstein (1999)	Geographic distance → acquisition success	Cross-border mergers and acquisitions are positively associated with employee resistance and negatively associated with organizational integration
Lindgren (1982) Marks and Mirvis (1993)	Geographic distance → acquisition success	Geographic distance can impede the interaction and coordination needed to realize synergies
Stuart and Sorenson (2003)	Geographic distance → acquisition success	Closer geographic proximity increases the density of liquidity events and leads to more success
Hunt (1990) Larsson and Finkelstein (1999)	Relative size → acquisition success	Organizational integration and the relative size of target to bidder is positively associated
Kusewitt (1985) Seth (1990) Larsson and Finkelstein (1999)	Relative size → acquisition success	Combination potential is negatively constrained by relative size of target to bidder

Study	Proposition	Rationale
Ranft and Lord (2002)	Relative size → acquisition success	Acquisition of a large firm makes communications more difficult both in terms of communicating integrating-related issues as well as in terms of actually exchanging rich and detailed knowledge across companies
Bergh (2001)	Retention → acquisition success	Keeping top executives leads to more acquisition success
Chatterjee (1992) Datta (1991)	Retention → acquisition success	Negative employee reaction is negatively associated with acquisition success
Larsson and Finkelstein (1999)	Retention → acquisition success	Employee resistance is negatively associated with the realization of synergy
Ranft and Lord (2000)	Retention → acquisition success	Retention is positively associated with acquisition success
Chatterjee (1992)	Culture fit → acquisition success	Culture clashes negatively affect acquisition success
Mirvis (1984)	Culture fit → acquisition success	Culture conflict negatively influence acquisition success
Weber, Shenkar and Raveh (1996)	Culture fit → acquisition success	Both national and corporate cultures are essential inputs determining merger processes and outcomes

**Table 4: Studies Focused on the Effect of Acquisition Strategy on Acquisition
Success Identified in the Professional Literature**

Study	Proposition	Rationale
Bunnell (2000) Goldblatt (1999) Mayer (2002) Paulson (2001)	Acquisition strategy → acquisition success	Geographic proximity is key to acquisition success
Bunnell (2000) Goldblatt (1999) Mayer (2002) McJunkin and Rynders (2000) Paulson (2001)	Acquisition strategy → acquisition success	Smaller size is key to acquisition success
Mayer (2002) McJunkin and Rynders (2000) Paulson (2001)	Acquisition strategy → acquisition success	High employee retention is key to acquisition success
Bunnell (2000) Goldblatt (1999) Mayer (2002) Paulson (2001)	Acquisition strategy → acquisition success	Right chemistry is key to acquisition success

2.2.1 Distance

Academic literature

Geographic proximity has a strong relationship with liquidity events such as acquisitions and initial public offerings (Stuart and Sorenson 2003). Closer geographic proximity leads to greater success. Greater geographic distance can impede the interaction and coordination needed to realize synergies (Lindgren 1982, Marks and Mirvis 1993).

Larsson and Finkelstein (1999) support existing findings that geographic distance affects acquisition success from an organizational integration perspective.

Professional literature

Spatial proximity was identified as an important determinant of Cisco's acquisition strategy (Mayer 2002). Geographic proximity (Goldblatt 1999) is so important that it became a necessary rule for target selection, for any large acquisitions, the target must be geographically collocated with a major Cisco facility (Paulson 2001 and Bunnell 2000). If the newly acquired firm is located close to Cisco, then integration would be much easier.

2.2.2 Size

Academic literature

The difference in the size of a target firm and a bidder firm affects acquisition success (Larsson and Finkelstein 1999). The size of acquired company is positively associated with the amount of organizational effort required to integrate the firm and realize synergies (Hunt 1990, Larsson and Finkelstein 1999). Combination potential is negatively associated with the size of the acquired company (Kusewitt 1985 and Seth 1990).

Ranft and Lord (2002), after studying the transfer of acquired technologies and capabilities, concluded that the large size of an acquired firm made communications more difficult both in terms of communicating about integration-related issues and exchanging rich and detailed knowledge. These difficulties lead to low acquisition success.

Professional literature

John Chambers, Cisco Systems CEO, does not believe that mergers of equal sized companies work (Paulson 2001 and Bunnell 2000). Cisco's management believes that acquisitions would be more manageable if they acquired small companies or start-ups predominantly made up of engineers, rather than firms of nearly equal size. Small companies and start-ups expect minor changes to occur. Thus, they are easier to manage (Mayer 2002).

Instead of acquiring large, established, public companies, Cisco typically acquired small private companies. The smaller acquisitions made integration easier. The acquisition of large, established companies with strong corporate cultures was more difficult to integrate and make successful (McJunkin and Rynders 2000).

2.2.3 Employee Retention

Academic literature

Employee resistance refers to the individual and collective opposition of employees to the combination and subsequent integration of the joining firms. Resistance is negatively associated with acquisition success (Larsson and Finkelstein 1999). Research from both psychological and career perspectives also suggests that negative employee reaction is negatively associated with acquisition success (Chatterjee 1992 and Datta 1991).

Employee retention is of central importance in knowledge-intensive acquisitions. These acquisitions are motivated by the acquirers' desire to use acquired employees to enhance their strategic technological capabilities (Ranft and Lord 2000). In addition to retention of technical employees, researches also suggest that the retention of the acquired company's top executives can lead to greater acquisition success (Bergh 2001). Executives that stay with the acquirer can also help attenuate employee resistance to the acquisition.

Professional literature

According to John Chambers, "In this business, if you're acquiring technology, you are acquiring people" (Paulson 2001). In fast-changing industries, very often the capabilities of the employees of the acquired firm are a significant component of a firm's value. Employee retention is vital for the preservation of the acquisitions value. Put differently,

if these employees leave or their practice is significantly disrupted, then the acquisition is almost certain to fail (Mayer 2002).

Cisco believes the people are the value and focuses on maintaining the management teams and the engineers of the acquired companies (Paulson 2001).

2.2.4 Culture Fit

Academic literature

Both the academic and practitioner literatures identify organizational culture as a key element influencing integration and the realization of synergy in acquisitions. Studies have found that differences in culture lead to polarization, negative evaluations of counterparts, anxiety, and ethnocentrism between members of the acquiring and target firms (Sales and Mirvis 1984). Culture clashes negatively affect acquisition success (Chatterjee 1992).

Studies focused on domestic and international acquisitions suggest that both national and corporate cultures are essential factors that determine merger's outcomes (Webber et al. 1996).

Professional literature

That the “chemistry must be right” was emphasized as a very important factor in determining the suitability of an acquisition (Paulson 2001). Knowing that the fit between cultures of two organizations is critical to making a valid judgment regarding the level of ease and success with which a post-acquisition environment can and will be managed.

Cultural similarity between the acquirer and target firm will be positively correlated with acquisition success (Mayer 2002).

2.3 Acquisition Success

Table 5 and 6 identifies the studies that examine how to measure acquisition success. Table 5 includes references in the academic literature and Table 6 references in the professional literature.

**Table 5: Studies Examining Acquisition Success that were Identified
in the Academic Literature**

Study	Proposition	Key results
Ahuja and Katila (2001) Hitt (1997)	Motive → acquisition success	Acquisition success can be measured as: entry into a new market, acquisition of new technological competencies, access to distribution channels, obtaining financial synergies, increasing market power, achieving diversification of the

Study	Proposition	Key results
		business, and avoiding competition
Ansoff (1971) Lubatkin (1987) Seth (1990)	Strategic management → acquisition success	Measure acquisition success as the performance of different types of acquisition combinations
Astrachan (1990) Levinson (1970) Hambrick and Cannella (1993)	Human Resource Management → acquisition success	Acquisition success was examined based on well psychological issues were resolved
Goldberg (1983) Ravenscraft and Scherer (1987)	Economics → acquisition success	Acquisition success was examined using accounting-based measures
Haspeslagh and Jemison (1991) Pablo (1994)	Organization → acquisition success	Acquisition success was examined focusing on post-combination and integration issues
Jarrell (1988)	Finances → acquisition success	Acquisition success was examined using stock-market-based measures
Larsson and Finkelstein (1999)	Synergy → acquisition success	Acquisition success was examined based on synergy realizations

**Table 6: Studies Examining Acquisition Success Identified
in the Professional Literature**

Study	Proposition	Key results
Hoe (2000) Mayer (2002)	Various objectives → acquisition success	fulfill the time-to-market requirement obtain best-of-breed product technology expand to new market leverage existing distribute channel the influx of new expertises

Academic literature

The research literature uses six methods to measure acquisition success.

1. From the strategic management perspective, acquisition success refers to the performance of different types of acquisition combinations (Ansoff 1971, Lubatkin 1987, and Seth 1990)
2. From the human resource management perspective, acquisition success was examined based on how well psychological issues were resolved (Astrachan 1990, Levinson 1970, Hambrick and Cannella 1993)
3. From an economic perspective, acquisition success was measured using accounting-based measures (Goldberg 1983, Ravenscraft and Scherer 1987).
4. From organization perspective, acquisition success was examined focusing on post-combination and integration issues (Haspeslagh and Jemison 1991, Pablo 1994).
5. From the finance perspective, acquisition success was measured using stock-market-based measures (Jarrell 1988).
6. From the synergy perspective, acquisition success was examined by examining whether or not synergies accrued from the acquisition (Larsson and Finkelstein 1999).

Acquisition success also needs to consider the objectives of the acquisition (Ahuja and Katila 2001, Hitt 1997). Ahuja and Katila give seven examples for different acquisition objectives or motives for an acquisition: i. Entry into a new market; ii. Acquire new technological competencies; iii. Access distribution channels; iv. Obtain financial synergies; v. Increase market power; and vi. Achieve diversification of business; and vii. Avoid competition.

Professional literature

From Cisco's point of view, there are five reasons for acquiring companies (Hoe 2000).

These reasons are:

- Fulfill the time-to-market requirement
- Obtain best-of-breed product technology
- Expand to new market
- Leverage existing distribution channel
- Bring in new expertise

2.4 Lessons Learned From the Literature Review

By reviewing the literature from both academic stream and professional stream, the author drew the following two key lessons:

1. There is very limited studies have been done on identifying firm- and market-level factors and examine how firm-level and market-level factors affect acquisition strategy.
2. The dimensions of an acquisition strategy have not been identified and how these dimensions affect acquisition success has not been made clear.

3. HYPOTHESES DEVELOPEMENT

The purpose of this research is to first develop a set of hypotheses anchored around a research model that relates company acquisition strategy with acquisition success and then to test these hypotheses using data on the 79 acquisitions made by Cisco Systems Inc. from January 1993 to May 2003. This section is organized into three parts. Section 3.1 introduces the research model used to anchor the hypotheses. Section 3.2 develops six sets of 12 hypotheses. Section 3.3 provides a list of the hypotheses.

3.1 Research Model

The research model used in this thesis is illustrated in Figure 1. The model describes how a company's acquisition strategy affects the success of the acquisition and how firm- and market-level factors affect acquisition strategy.

Four dimensions describe a company's acquisition strategy: Distance, Size, Retention and Culture Fit. Distance refers to the spatial distance between the location of the closest bidder's main facility and the location of the acquired company.

Size refers to the number of employees of the acquired company.

Retention refers to the extent to which employees of the acquired company remain with the company that acquired them after a given period of time (i.e., two years after the acquisition).

Culture fit refers to the extent to which the culture of the acquired company compatible to the culture of the company that acquired it.

Figure 1: Research Model that Relates Acquisition Strategy with Acquisition Success and Firm-level and Market Level Factors with Acquisition Strategy

The firm-level and market-level factors that affect a company’s acquisition strategy are shown on the left of Figure 1. The research model shown in Figure 1 posits that Acquisition Experience is the firm level factor that affects the four dimensions of

acquisition strategy the most and that the equity market index is the market level factor that most affects acquisition strategy.

Acquisition experience refers to the corporate knowledge acquired over time on how a company can make an acquisition a successful one. Market index refers to equity market indices such as the New York Stock Exchange market index and the National Association of Securities Dealers Automatic Quotation System (NASDAQ) index.

The relationship between acquisition strategy and acquisition success is shown to the right of Figure 1. Acquisition success is a qualitative measure of how well the employees, products, technologies and processes of the company that was acquired met the objectives for which they were acquired.

Six methods were identified to measure acquisition success in the literature review. Different performance measures may provide contradictory results (Mayer 2002). To resolve this problem, acquisition success needs to be measured by focusing on the motives and objectives that motivated the acquisitions (Ahuja and Katila 2001, Hitt 1997).

3.2 Hypotheses

In this section the author builds on the literature to develop six hypotheses anchored around the research model shown in Figure 1.

Acquisition Experience

The more a company purchases other companies the better it becomes at doing so. A firm's acquisition experience helps it learn how to select the right acquisition (Hayward 2002) and what needs to be done to make the acquisition successful.

As the experience with acquisitions becomes formalized into company processes, the acquisition related corporate knowledge starts to guide other acquisitions (Mayer 2002). Stuart and Sorenson (2003) argue that the greater the company's experience with acquisitions, the shorter the location from the bidder to the companies targeted to be acquired. Based on the literature, the author expects high acquisition experience to shorten the distance between the bidder and the acquired companies. Therefore,

Hypothesis 1a: Acquisition experience is negatively related to the distance between the location of closest Cisco main facility and the location of the acquired company.

Ranft and Lord (2002) conclude that as the experience with acquisitions increases the size of the acquired companies becomes smaller. As experience with acquisitions increases, the acquirer becomes aware that smaller companies are much easier to integrate than large companies. In addition, if the acquired company is small and fails to meet the objectives for which it was acquired, the negative impact on the operations of

the acquirer is relatively small (Paulson 2001). Accordingly, the author expects high acquisition experience to be negatively related to the size of the company acquired. Therefore,

Hypothesis 1b: Acquisition experience is negatively related to size of the acquired company.

Larsson and Finkelstein (1999) claim that a company with high acquisition experience is able to better overcome integration obstacles and retain the employees of the acquired company. Previous research suggests that the employees of acquired companies react unfavorably to acquisitions (Hambrick and Cannella 1993). Employees of acquired companies will leave if the “merger syndrome” issues described by Marks and Mirvis (1986) cannot be handled properly. A company with high acquisition experience is able to resolve the “merger syndrome” issues more effectively (Walter 1985). The author expects high acquisition experience to be positively related to the acquired company employee retention. Therefore,

Hypothesis 1c: Acquisitions experience is positively related to the retention rate of the employees of the acquired company.

Webber et al. (1996) argue that companies with high acquisition experience are better able to purchase companies that have a good fit with their own corporate cultures. Culture clashes are not uncommon and have a negative effect on acquisition performance

(Chatterjee et al. 1992). Experienced firms would never pursue the un-matched acquisition in the first place (Paulson 2001). The author expects high acquisition experience to be positively related to fit between the acquirer's culture and the culture of the acquired company. Therefore,

Hypothesis 1d: Acquisition experience is positively related to the fit between Cisco's culture and the acquired company's culture.

Market Index

Research on mergers and acquisitions has sought to link the overall stock market levels with merger activity and performance (Bouwman et al. 2002). Periods of high merger activity correlate with high market valuations (Jovanovic and Rousseau 2001).

When market trends reflect fast industry growth, a company may push an aggressive acquisition strategy. Management may overestimate its own abilities and purchase far away companies believing that it can overcome distance related obstacles (Rau and Vermaelen 1998). Thus, the author expects the Market index to be positively related to distance. Therefore,

Hypothesis 2a: Market index is positively related to the distance between the location of closest Cisco's main facility and the location of the acquired company.

When the market index reflects growth conditions, capital is readily available to purchase larger companies. When the market index is high, glamour firms can use the value of their stock to purchase larger companies than they could when the market is down (Jovanovic and Rousseau 2001). The author expects that a high Market index will be positively related to the size of the acquired companies. Therefore,

Hypothesis 2b: Market index is positively related to the size of the acquired company.

During market growth periods, job-hopping is pervasive. This makes it difficult to maintain people (Mayer 2002) including employees of acquired companies. The author expects that a high Market index will be negatively related to employee retention. Therefore,

Hypothesis 2c: Market index is negatively related to the retention rate of the employees of the acquired company.

During fast industry growth, a company may push an aggressive acquisition strategy and purchase companies with cultures that are not a good fit with its own corporate culture (Byrne and Elgin 2002). Thus, the author expects the Market index to be negatively related to culture fit. Therefore,

Hypothesis 2d: Market index is negatively related to the fit between Cisco's culture and the acquired company's culture.

Distance and Acquisition Success

Human beings interact through communication and teamwork. Large distances raise obstacles that must be overcome and this may reduce the efficiency of integrating a team. If the acquired company is close to the bidder's main facility or collocated with the bidder's employees, it is easier to integrate operations. Researchers conclude that closer geographic proximity increases the likelihood of acquisition success (Stuart and Sorenson 2003). Based on the literature, the author expects that a greater distance to the location of the acquired company decreases acquisition success. Therefore,

Hypothesis 3: The distance between the location of closest Cisco's main facility and the location of the acquired company is negatively related to acquisition success.

Size of the Acquired Company and Acquisition Success

Two companies with equally strong cultures, personnel, and resources cannot effectively merge since inevitable power and cultural clashes will occur. Existing research indicates that if the acquired firm is large, communications between the bidder and the acquired company are more difficult. Large size is an obstacle to effectively dealing with integration related issues as well as facilitating rich exchanges and detailed knowledge sharing (Ranft and Lord 2002). Based on the literature the author expects the size of the acquired firm to be negatively related to acquisition success. Therefore,

Hypothesis 4: The size of the acquired company is negatively related to acquisition success.

Employee Retention and Acquisition Success

In fast-changing industries, often the capabilities of the employees of the acquired firm are a significant. These capabilities account for a significant part of the acquired firm's value. It's the people who innovate and build products. Losing these people reduces the company's ability to exploit the acquisition. To preserve and then grow the values of the acquisition, retention of the employees with significant capabilities is a key concern (Mayer 2002). Based on the literature, the author expects that high retention rates are positively related to acquisitions success. Therefore,

Hypothesis 5: The retention rate of the employees of the acquired company is positively related to acquisition success.

Culture Fit

Culture refers to the shared assumptions held by the people in an organization (Schein 1999). The content of a culture involves important shared understandings, beliefs, and expectations. This content generates the manifestations of the culture, such as goods or services (shared things), verbal expressions (shared sayings), behaviours (shared activities), and emotions (shared feelings). Share a common vision of the future from both an industry and a product perspective. Cisco clearly reinforces the culture statements by printing them on employees' badge. "Quality team, Stretch goals, No technology religion, Frugality, Trust/Fair/Integrity, Teamwork, Market transitions, Fun, Drive change, Empowerment, Open communication and solely dedicated to customer success." Studies have found that differences in culture lead to polarization, negative evaluations of counterparts, anxiety, and ethnocentrism between members of the acquiring and target firms (Sales and Mirvis 1984). Culture clashes negatively affect acquisition success (Chatterjee 1992). High fit between two firms increases acquisition success (Mayer 2002). The author expects that the greater the fit of the two cultures is, the greater the success of the acquisition. Therefore,

Hypothesis 6: The fit between Cisco's culture and the acquired company's culture is positively related to acquisition success.

3.3 List of the Hypotheses Developed in this Research Study

The hypotheses that will be tested were developed from the literature. The list of hypotheses is:

Hypothesis 1a: Acquisition experience is negatively related to the distance between the location of closest Cisco's main facility and the location of the acquired company.

Hypothesis 1b: Acquisition experience is negatively related to the size of the acquired company.

Hypothesis 1c: Acquisitions experience is positively related to the retention rate of the employees of the acquired company.

Hypothesis 1d: Acquisition experience is positively related to the fit between Cisco's culture and the acquired company's culture.

Hypothesis 2a: Market index is positively related to the distance between the location of closest Cisco's main facility and the location of the acquired company.

Hypothesis 2b: Market index is positively related to the size of the acquired company.

Hypothesis 2c: Market index is negatively related to the retention rate of the employees of the acquired company.

Hypothesis 2d: Market index is negatively related to the fit between Cisco's culture and the acquired company's culture.

Hypothesis 3: The distance between the location of closest Cisco's main facility and the location of the acquired company is negatively related to acquisition success.

Hypothesis 4: The size of the acquired company is negatively related to acquisition success.

Hypothesis 5: The retention rate of the employees of the acquired company is positively related to acquisition success.

Hypothesis 6: The fit between Cisco's culture and the acquired company's culture is positively related to acquisition success.

4. RESEARCH METHOD

4.1 Unit of Analysis

The unit of analysis was a company acquired by Cisco.

4.2 Study Period

The study period was from January 1993 to May 2003.

4.3 Sample

The sample was comprised of all companies acquired by Cisco Systems Inc. from January 1993 to May 2003.

4.4 Measures

4.4.1 Acquisition experience

Acquisition experience was measured using the procedure designed by Hayward (2002). If the acquisition was made prior to January 1st 1998, the value of acquisition experience was 0. If the acquisition was made on January 1st 1998 or afterwards, the value of acquisition experience was 1.

Hayward (2002) proposed a way to measure acquisition experience. He classified the acquisitions that firms made in their first five years in the “experience forming” category. The firms received an experience score of 0. After that, firm acquisition experience was the sum of the number of recent acquisitions undertaken by the firm constrained by similarity of prior acquisitions. Similarity of prior acquisitions was measured by the most common 4 digit SIC (Standard Industrial Classification) code. If all prior acquisitions are within the same SIC code the score was 1.

4.4.2 Market index

Cisco’s common stock shares trade in the National Association of Securities Dealers Automatic Quotation System (NASDAQ) index. For this reason the author used the NASDAQ composite index to calculate the market index. NASDAQ composite index reflects the dynamics of the industry environment and market trends.

The market index reflects the six-month change in the NASDAQ index prior to the date of acquisition. Six months is the average time Cisco takes from target screening to make acquisition announcement. The change in the market index was calculated as:

$$\text{Change in NASDAQ index} = \frac{\text{NASDAQ index on day acquisition was announced} - \text{NASDAQ index six months prior to day acquisition was announced}}{\text{NASDAQ index six months prior to day acquisition was announced}}$$

4.4.3 Distance

Distance is measured as the number of miles a car needs to travel to go from the closest Cisco's main facility in the United States to the headquarters of the acquired company.

To measure distance the author used the approach proposed by Stuart and Sorenson (2003) and the Yahoo Maps online tool to obtain the driving distance between any two ZIP locations. For the cross-border acquisitions, the author measured the distance from one point to the other.

The four main Cisco facilities used to calculate distances to the closest acquired companies are:

- San Jose, California 95134, Cisco's headquarter
- New England, Boxborough 01719, Massachusetts
- Research Triangle Park, North Carolina 27709
- Richardson, Texas 75082

4.4.4 Size

Size was measured as the total number of employees of the acquired company.

4.4.5 Retention

The retention rate of the employees of the acquired company, was calculates as,

$$\text{Retention} = \frac{\text{Number of employees of the acquired company still working for Cisco two years after the date the company was acquired}}{\text{Number of employees of the acquired company when it was acquired}}$$

The reason to choose two years time period for retention measurement is because Cisco takes two years for the completion of one acquisition integration.

4.4.6 Culture Fit

For each acquired company, the level of fit between Cisco's culture and the acquired company's culture was measured by asking a respondent to rate his/her agreement to the statement: *At the time of the acquisition, the target firm's culture was compatible with Cisco's culture*, using the following scale:

1 Strongly Disagree	2 Disagree	3 Will not go along	4 Probably will go along	5 Will go along	6 Agree	7 Strongly agree	0 Don't Know

4.4.7 Acquisition success

To measure acquisition success, the author used a method consistent with that in Ahuja, et al. (2001). The success of an acquisition was measured based on the extent to which

the acquisition met its specific objectives. A respondent was asked to rate his/her agreement with the statement: *This acquisition met its objective*, using the following scale:

1 Strongly Disagree	2 Disagree	3 Will not go along	4 Probably will go along	5 Will go along	6 Agree	7 Strongly agree	0 Don't Know

4.5 Data Collection

4.5.1 Acquisition experience

The days in which Cisco announced its acquisitions were obtained from Cisco's public acquisition summary website at:

http://www.cisco.com/en/US/about/ac49/ac0/ac1/about_cisco_acquisition_years_list.html

And Cisco's public SEC investor filings website accessible at:

<http://investor.cisco.com/phoenix.zhtml?c=81192&p=irol-sec>

If the acquisition was made prior to January 1st 1998, the value of acquisition experience was 0. If the acquisition was made on January 1st 1998 or afterwards, the value of acquisition experience was 1.

4.5.2 Market index

Data on the NASDAQ index was obtained from the NASDAQ Historical Prices accessible through the Yahoo Finance Website at:

<http://finance.yahoo.com/q/hp?s=^IXIC>

4.5.3 Distance

To measure distance, the author used the Yahoo Maps online tool. The author measured the distance from the closest Cisco's main facility to the acquired company and the location of the acquired company. Yahoo Maps and driving direction was accessed using the following website

<http://maps.yahoo.com/dd>

4.5.4 Size

The number of employees of the acquired companies was obtained from Cisco's public acquisition summary website at:

http://www-search.cisco.com/en/US/about/ac49/ac0/ac1/about_cisco_acquisition_years_list.html

4.5.5 Retention

The number of employees that were still working at Cisco two years after they were acquired was obtained from Cisco's Human Resource department. The data is proprietary and will not be shared with the public.

4.5.6 Culture Fit and Acquisition Success

For each acquisition, ratings on culture fit and acquisition success were obtained from one Cisco business development manager judged to be knowledgeable about Cisco's acquisition strategy, integration process, products and markets over the 1993-2003 periods.

This respondent has not seen the research model used in this thesis.

4.6 Data Analysis

4.6.1 Descriptive statistics

Descriptive statistics for all the variables were calculated and the Kurtosis and Skewness statistics were used to determine whether or not the variables were randomly distributed. A variable was judged to be normal distributed when Skewness was less than twice the standard error and kurtosis was within the +2 and -2 range.

4.6.2 Correlation tests

A correlation analysis was used to find pairs of variable that were associated.

The association between the two exogenous variables, Acquisition Experience and Market Index was tested using the Spearman correlation coefficients. Significance was determined at $P < .10$ (two tailed).

The associations among the four dimensions of Acquisition strategy, Size, Distance, Retention and Culture Fit were also determined using the Spearman correlation coefficients. Significance was determined at $P < .10$ (two tailed).

Associations between Acquisition Experience, Market index, and the four dimensions of acquisition strategy were determined using the Spearman correlation coefficients with significance determined at $P < .10$ (one tailed).

Associations between the four dimensions of acquisition strategy and Acquisition Success were determined using the Spearman correlation coefficients with significance determined at $P < .10$ (one tailed).

4.6.3 Structured equation models

In order to test the hypotheses the author used the results of the correlation analyses to build models and the AMOS software to estimate the regression estimates of these models.

The author developed structured equation models. Structure Equation Modeling (SEM) is an extension of the general linear model (GLM) that enables a researcher to test a set of regression equations simultaneously. AMOS combines path analysis with multi-level regression to provide both an overall assessment of the fit of a hypothesized model to the data and tests of individual hypotheses.

The decision to whether or not accept a hypothesis was based on the regression estimates in the structure equation models and the correlation coefficients.

5. RESULTS

5.1 Sample

The sample is comprised of 79 of the 81 acquisitions made by Cisco Systems Inc. from 1993 to December 2003.

Two acquisitions, Pixstream and Linksys were excluded from the sample because they were outliers. Pixstream was acquired in August 2000 and was sold six months later during Cisco's first layoff in history. Linksys was acquired in March, 2003 to operate as a sub-division with autonomous power. The Pixstream and Linksys acquisitions are materially different from the other 79 acquisitions.

Appendix A provides the list of the acquisitions included in the sample and Table 7 provides the number of companies Cisco acquired that are in the sample by year.

Table 7: Number of Acquisition in the Sample by Year

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Number of acquisitions	1	3	4	7	6	9	18	22	2	5	2

5.2 Descriptive Statistics

Table 8 provides the descriptive statistics for the variables in the model shown in Figure 1. Instead of market index, the author uses NASDAQ Index in the remainder of the thesis. The author does this to make clear which market index the author is using.

Examination of the Skewness and Kurtosis statistics in Table 8 led the author to conclude that the eight variables are not normally distributed. For each variable, the Skewness statistics was greater than two times its standard error.

Table 8: Descriptive Statistics of the Variables in this Research

(Sample Size = 79)

	Min	Max	Mean	Standard deviation	Skewness		Kurtosis	
					Statistic	Std. Error	Statistic	Std. Error
Acquisition experience	0	1	.73	.445	-1.081	.271	-.854	.535
NASDAQ index	-.360	.810	.15	.269	.678	.271	.269	.535

Distance to Acquired Company	.7	7455	906.25	2161.171	2.369	.271	4.033	.535
Size of Acquired Company	8	1200	103.42	163.566	4.769	.271	27.676	.535
Retention of Employees	.800	.900	.88	.035	-2.082	.274	2.396	.541
Culture Fit	0	7	4.96	1.597	-.906	.271	.993	.535
Acquisition Success	0	7	4.66	1.818	-.524	.271	-.718	.535

5.3 Spearman Correlation Coefficients

Exogenous variables

The model in Figure 1 includes one firm level variable, Acquisition Experience, and one market level variable, the National Association of Securities Dealers Automatic Quotation System (NASDAQ) index. Table 9 shows the Spearman correlation coefficients among these two variables. Table 9 shows that the association between Acquisition Experience and NASDAQ Index is not significant (two tailed).

Table 9: Descriptive Statistics of the Variables in this Research

(Sample Size = 79)

		Acquisition experience
NASDAQ Index	Coefficient	.083
	Sig. (2 tailed)	.467
	N	79

* p < 0.10 (two tailed)
** p < 0.05 (two tailed)
*** p < 0.01 (two tailed)

Endogenous Variables

Distance between the location of closest Cisco's main facility and the location of the acquired company (Distance), the size of the company when acquired (Size), the rate of retention of the acquired company's employees (Retention), and the fit between Cisco's culture and the culture of the acquired company (Culture Fit) were the four endogenous variables in the research model. Table 10 provides the Spearman correlation coefficients amongst the four endogenous variables.

**Table 10: Spearman Correlation Coefficients for Endogenous
Variables in the Research Model**

		Distance	Size	Retention
Size	Coefficient	-.009		
	Sig. (2 tailed)	.935		
	N	79		
Retention	Coefficient	-.147	-.233**	
	Sig. (2 tailed)	.202	.041	
	N	77	77	
Culture Fit	Coefficient	-.452***	-.189*	.143
	Sig. (2 tailed)	.000	.095	.214
	N	79	79	77

* p < 0.10 (two tailed)

** p < 0.05 (two tailed)

*** p < 0.01 (two tailed)

The results in Table 10 indicate that Distance and Fit are negatively correlated at $P < .01$ and that Size and Retention are negatively correlated at $P < .05$. Size and Fit are negatively correlated at $P < 0.1$.

Exogenous and Endogenous Variables

Table 11 provides the Spearman correlation coefficients between the two exogenous variables: Acquisition experience, and the NASDAQ index and the four endogenous variables: Distance, Size, Retention and Culture Fit.

Table 11: Spearman Correlation Coefficients between Exogenous and Endogenous Variables in the Research Model

		Distance	Size	Retention	Culture Fit
Acquisition experience	Coefficient	.253**	.080	-.167*	-.422***
	Sig. (1 tailed)	.012	.241	.074	.000
	N	79	79	77	79
NASDAQ Index	Coefficient	.239**	.159*	-.342***	-.293***
	Sig. (1 tailed)	.017	.081	.001	.004
	N	79	79	77	79

* p < 0.10 (one tailed)

** p < 0.05 (one tailed)

*** p < 0.01 (one tailed)

The one tailed tests indicate that Acquisition experience is positively correlated with Distance ($P < .05$) and negatively correlated with Retention ($P < 0.1$) and Culture Fit ($P < .01$); and the NASDAQ index is positively correlated with Distance ($P < .05$) and negatively correlated with Retention ($P < .01$) and Culture Fit ($P < .01$). NASDAQ Index is positively correlated with Size ($P < 0.1$).

Endogenous Variables and Performance

Table 12 provides the Spearman correlation coefficients between the four endogenous variables and the performance variable: Acquisition Success. The results show that Acquisition Success is negatively correlated with Distance and Size and positively correlated with Retention and Culture Fit at $P < .05$.

Table 12: Spearman Correlation Coefficients between Endogenous Variables and Acquisition Success

		Distance	Size	Retention	Culture Fit
Acquisition Success	Coefficient	-.413***	-.255**	.234**	.828***
	Sig. (1 tailed)	.000	.012	.020	.000
	N	79	79	77	79

* p < 0.10 (one tailed)
 ** p < 0.05 (one tailed)
 *** p < 0.01 (one tailed)

5.4 Structured Equations Models

The author developed models that used the results in Section 5.3 Spearman correlation coefficients to capture the interactions amongst the variables in the research model shown in Figure 1 and then the author used the AMOS software to calculate the regression estimates of the variables in the model.

The goodness of fit of each model was evaluated using the following criteria:

1. The probability of the model, P, must be greater than .05
2. The TLI index of the model must be greater than .95
3. The RMSEA of the model must be less than .06

Model 1

Figure 2 illustrates the pairs of variables in Tables 11 and 12 that are correlated.

**Figure 2: Variable Pairs in Tables 11 and 12 with Spearman
Correlation Coefficients that are Significant at $P < .10$**

The author developed Model 1 using the directional relationships shown in Figure 1 and the correlation results shown in Tables 11 and 12. The author uses $\rightarrow$ to show a directional relationship and $\leftrightarrow$ to represent the associations found to be significant at $P < .10$ in Tables 9 and 10.

Model 1 was specified as:

Experience with Acquisition $\rightarrow$ Distance

Experience with Acquisition $\rightarrow$ Retention

Experience with Acquisition → Culture Fit

NASDAQ Index → Distance

NASDAQ Index → Size

NASDAQ Index → Retention

NASDAQ Index → Culture Fit

Distance → Acquisition Success

Size → Acquisition Success

Retention → Acquisition Success

Culture Fit → Acquisition Success

Distance ↔ Culture Fit

Size ↔ Culture Fit

Size ↔ Retention

Table 13 shows the results of using the AMOS software to calculate the regression estimates for Model 1. The goodness of fit statistics indicates that the model fits the data very well. The probability level is greater than .05; The TLI is greater than .95 and the RMSEA is less than .06.

Table 13: Results of Using AMOS to Obtain Regression

Estimates for Model 1

Model 1		Regression estimate	p
Links in paths			
Chi-square = 4.164	Acquisition Experience → Distance	.235	.033**
Degrees of freedom = 7	Acquisition Experience → Retention	-.120	.259
Probability level = .761	Acquisition Experience → Culture Fit	-.384	.000***
TLI = 1.089	NASDAQ Index → Distance	.069	.531
RMSEA = .000	NASDAQ Index → Size	.077	.496
Squared multiple correlations	NASDAQ Index → Retention	-.355	.001***
Acquisition success = .73	NASDAQ Index → Culture Fit	-.234	.021**
Distance = .06	Distance → Acquisition Success	.061	.340
Size = .00	Size → Acquisition Success	-.107	.077*
Retention = .14	Retention → Acquisition Success	.152	.011**
Culture Fit = .20	Culture Fit → Acquisition Success	.813	.000***

* p < 0.10

** p < 0.05

*** p < 0.01

Model 2

To improve the fit of the model, the author developed Model 2 by eliminating the four links that were not significant at $P < .10$. Thus, Model 2 was specified as:

Experience with Acquisition → Distance

Experience with Acquisition → Culture Fit

NASDAQ Index → Retention

NASDAQ Index → Culture Fit

Size → Acquisition Success

Retention → Acquisition Success

Culture Fit → Acquisition Success

Distance ↔ Culture Fit

Size ↔ Culture Fit

Size ↔ Retention

Table 14 provides the results of using AMOS to calculate the regression estimates for Model 2. The goodness of fit statistics indicates that Model 2 fits the data well. The probability level is greater than .05; the TLI is greater than .095 and the RMSEA is less than .06.

Table 14: Results of Using AMOS to Obtain Regression Estimates for Model 2

Model 2		Regression estimate	p
Links in paths			
Chi-square = 7.175	Acquisition Experience → Distance	.242	.028
Degrees of freedom = 11	Acquisition Experience → Culture Fit	-.389	.000***
Probability level = .785	NASDAQ Index → Retention	-.368	.000***
TLI = 1.076	NASDAQ Index → Culture Fit	-.199	.034
RMSEA = .000	Size → Acquisition Success	-.113	.065
Squared multiple correlations	Retention → Acquisition Success	.161	.008
Acquisition success = .72	Culture Fit → Acquisition Success	.792	.000***
Distance = .06			
Size = .00			
Retention = .13			
Culture Fit = .19			

* p < 0.10

** p < 0.05

*** p < 0.01

Model 3

Model 2 included three of the four endogenous variables. This is because the link Distance → Acquisition Success was removed from Model 1. To explore what would happen in a model that included all four endogenous variables in a model, the author developed Model 3.

Model 3 was developed adding the Distance → Acquisition Success link to Model 2.

Model 3 was specified as:

Experience with Acquisition → Distance

Experience with Acquisition → Culture Fit

NASDAQ Index → Retention

NASDAQ Index → Culture Fit

Distance → Acquisition Success

Size → Acquisition Success

Retention → Acquisition Success

Culture Fit → Acquisition Success

Distance ↔ Culture Fit

Size ↔ Culture Fit

Size ↔ Retention

Table 15 provides the results of using AMOS to calculate the parameters for Model 3. The model fits the data just as well as Model 2 did. The results in Table 15 show that the correlation coefficient for Distance in the Distance → Acquisition Success link is not significant at $P < .10$. Thus, this link can be safely eliminated.

Table 15: Results of Using AMOS to Obtain Regression Estimates for Model 3

Model 3		Regression estimate	p
Links in paths			
Chi-square = 6.272	Acquisition Experience → Distance	.242	.028**
Degrees of freedom = 10	Acquisition Experience → Culture Fit	-.389	.000***
Probability level = .792	NASDAQ Index → Retention	-.368	.000***
TLI = 1.082	NASDAQ Index → Culture Fit	-.199	.034**
RMSEA = .000	Distance → Acquisition Success	.062	.336
Squared multiple correlations	Size → Acquisition Success	-.109	.076*
Acquisition success = .72	Retention → Acquisition Success	.156	.010**
Distance = .06	Culture Fit → Acquisition Success	.817	.000***
Size = .00			
Retention = .13			
Culture Fit = .19			

* p < 0.10
 ** p < 0.05
 *** p < 0.01

Model 4

The results for Model 3 indicate that Distance is not a factor that affects acquisition success. The author decided to remove the variable Distance altogether from the model. Model 4 was developed eliminating the Acquisition Experience → Distance link from Model 2.

Model 4 did not include the variable Distance in Figure 1. Model 4 was specified as:

Experience with Acquisition → Culture Fit

NASDAQ Index → Retention

NASDAQ Index → Culture Fit

Size → Acquisition Success

Retention → Acquisition Success

Culture Fit → Acquisition Success

Size ↔ Culture Fit

Size ↔ Retention

Table 16 provides the results of using AMOS to calculate the regression estimates for Model 4. The goodness of fit statistics indicates that Model 4 fits the data well. The probability level is greater than .05; the TLI is greater than .095 and the RMSEA is less than .06.

Table 16: Results of Using AMOS to Obtain Regression

Estimates for Model 4

Model 4		Regression estimate	p
Links in paths			
Chi-square = 5.127	Acquisition Experience → Culture Fit	-.385	.000***
Degrees of freedom = 7	NASDAQ Index → Retention	-.368	.000***
Probability level = .644	NASDAQ Index → Culture Fit	-.218	.027**
TLI = 1.047	Size → Acquisition Success	-.112	.066*
RMSEA = .000	Retention → Acquisition Success	.160	.008***
Squared multiple correlations	Culture Fit → Acquisition Success	.792	.000***
Acquisition success = .72			
Size = .00			
Retention = .14			
Culture Fit = .20			

* p < 0.10

** p < 0.05

*** p < 0.01

5.5 Hypothesis Acceptance or Rejection

To accept or reject hypotheses the author examines the Spearman correlation coefficients shown in Tables 5 and 6 and the regression estimates of Models 1, 2, 3 and 4 shown in Tables 13, 14, 15 and 16 respectively. A hypothesis was supported when:

- The relevant regression estimate in Model 1, 2, or 4 was significant at $p < .10$ and in the same direction as expected
- The relevant Spearman correlation coefficient in Table 11 or 12 was significant at $p < .10$ and in the same direction as expected

Results were deemed inconclusive when the relevant Spearman correlation coefficient was significant at $P < .10$ but the relevant regression estimate was not significant or was significant in the opposite direction.

Table 17 shows the hypotheses judged to be accepted, rejected or inconclusive.

Table 17: Summary of Test Results Organized by Hypothesis

Hypothesis	Decision based on test results	Rationale
Hypothesis 1a Acquisition experience is negatively related to the distance between the location of closest Cisco's main facility and the location of the start-up.	Rejected, significant in the opposite direction	The correlation coefficient for Acquisition Experience and Distance in Table 11 is positive and significant at $P < .05$, and the regression coefficient for Acquisition Experience in the Acquisition Experience → Distance link in Model 2 shown in Table 14 is positive and significant at $P < .10$.
Hypothesis 1b Acquisition experience is negatively related to the size of the acquired company	Rejected	The correlation coefficient for Acquisition Experience and Size in Table 11 is not significant at $P < .10$.
Hypothesis 1c Acquisition experience is positively related to the retention rate of the employees of the acquired company.	Inconclusive	The correlation coefficient for Acquisition Experience and Retention in Table 11 is negative and significant at $P < .10$, however, the regression coefficient for Acquisition Experience in the Acquisition Experience → Retention link is not significant in Model 1 shown in Table 13.
Hypothesis 1d	Rejected,	The correlation coefficient for

Hypothesis	Decision based on test results	Rationale
Acquisition experience is positively related to the fit between Cisco's culture and the acquired company's culture.	significant in opposite direction	Acquisition Experience and Culture Fit in Table 11 is negative and significant at $P < .01$, and the regression coefficient for Acquisition Experience in the Acquisition Experience $\rightarrow$ Culture Fit link in Model 2 shown in Table 14 is negative and significant at $P < .01$.
Hypothesis 2a Market index is negatively related to the distance between the location of closest Cisco's main facility and the location of the start-up.	Rejected	The correlation coefficient for NASDAQ and Distance in Table 11 is positive and significant at $P < .05$, and the regression coefficient for NASDAQ in the NASDAQ $\rightarrow$ Distance link in Model 1 shown in Table 13 is not significant at $P < .10$.
Hypothesis 2b Market index is negatively related to the size of the acquired company	Rejected	The correlation coefficient for NASDAQ and Size in Table 11 is positive and significant at $P < .10$, and the regression coefficient for NASDAQ in the NASDAQ $\rightarrow$ Size link in Model 1 shown in Table 13 is not significant at $P < .10$.
Hypothesis 2c Market index is negatively related to the retention rate of the employees of the acquired company.	Supported	The correlation coefficient for NASDAQ and Retention in Table 11 is negative and significant at $P < .01$, and the regression coefficient for NASDAQ in the NASDAQ $\rightarrow$ Retention link in Models 2 and 4 shown in Tables 14 and 16 is negative and significant at $P < .01$.
Hypothesis 2d Market index is negatively related to the fit between Cisco's culture	Supported	The correlation coefficient for NASDAQ and Culture Fit in Table 11 is negative and

Hypothesis	Decision based on test results	Rationale
and the acquired company's culture.		significant at $P < .01$, and the regression coefficient for NASDAQ in the NASDAQ → Culture Fit link in Models 2 and 4 shown in Tables 14 and 16 is negative and significant at $P < .05$.
Hypothesis 3 The distance between the location of closest Cisco's main facility and the location of the start-up is negatively related to acquisition success.	Inconclusive	The correlation coefficient for Distance and Acquisition Success in Table 12 is negative and significant at $P < .01$, however, the regression estimate for Distance in the Distance → Acquisition Success link in Model 3 is not significant at $P < .10$.
Hypothesis 4 The size of the acquired company is negatively related to acquisition success.	Supported	The correlation coefficient for Size and Acquisition Success is negative and significant at $P < .05$ and the regression estimate for Size in the Size → Acquisition Success link in Models 2, 3 and 4 is negative and significant at $P < .10$.
Hypothesis 5 The retention rate of the employees of the acquired company is positively related to acquisition success.	Supported	The correlation coefficient for Retention and Acquisition Success is positive and significant at $P < .05$ and the regression estimate for Retention in the Retention → Acquisition Success link in Models 2, 3 and 4 is negative and significant at $P < .01$.
Hypothesis 6 The fit between Cisco's culture and the acquired company's culture is positively related to acquisition success.	Supported	The correlation coefficient for Retention and Acquisition Success is positive and significant at $P < .05$ and the regression estimate for Retention in the Retention → Acquisition Success link in

Hypothesis	Decision based on test results	Rationale
		Models 2, 3 and 4 is negative and significant at $P < .01$.

6. DISCUSSION OF RESULTS

The objectives of this research were to:

- Develop a set of hypotheses anchored around a model that relates company acquisition strategy with acquisition success
- Test the hypotheses using data on the acquisitions made by Cisco Systems Inc. from January 1993 to May 2003

6.1 Firm-level Factor that Affects Cisco's Acquisition Strategy

The first set of hypotheses tested whether firm-level factor, Acquisition Experience, affected the four dimensions of acquisition strategy: Distance, Size, Retention, and Culture Fit.

None of the hypotheses relating Acquisition Experience with the four dimensions of acquisition strategy was supported. The author expected Acquisition Experience to be negatively related to Distance and positively related to Culture Fit. The results suggest the opposite. Acquisition Experience is positively related to Distance and negatively related to Culture Fit.

High acquisition experience leads to the acquisition of companies that are further away from the location of the closest Cisco's main facility and to acquire companies with a culture which is less of a fit with Cisco's culture.

The results suggest that acquisition experience may have two roles. During the pre-acquisition stage, experience guides the selection of the company to be acquired. During the post acquisition stage, experience can be relied upon to fix integration issues. Schweiger and Goulet (2002) indicate that differences in cultures between combining firms can be bridged through deep cultural learning interventions that develop the constructive employee perceptions necessary to facilitate integration and enhance acquisition performance. The result suggests that experienced acquirer will be more confident to handle the culture incompatible issues.

The results suggest that Acquisition Experience was not related to Size. It is not clear whether or not Acquisition Experience affects Retention.

6.2 Market-Level Factor that Affects Acquisition Strategy

The second set of hypotheses tested the relationship between NASDAQ Index and the four dimensions of Cisco's acquisition strategy factors. Author's results suggest that the market index is negatively related to both Retention and Culture Fit. High NASDAQ index is related to low retention rates of the acquired companies' employees and weaker fit between Cisco's culture and the acquired company's culture. The author had expected

both of these results. These findings are consistent with previous research (Mayer 2002). In periods of economic growth it is more difficult to retain good employees. Moreover, in growth periods a company may be more aggressive in its acquisition practices and tend to purchase companies that have cultures which are not tight fits with its own culture (Byrne and Elgin 2002). Management may overestimate company capabilities and violate the rules for successful acquisitions (Rau and Vermaelen 1998).

It is not clear whether or not the market index affects Distance or Size. While the respective correlation coefficients were significant at $P < .10$, the regression estimates were not.

6.3 Acquisition Strategy and Acquisition Success

The next four sets of hypotheses examined the relationship between the dimensions of acquisition strategy and acquisition success. Author's results suggest that Culture Fit affects acquisition success more than the other three dimensions of acquisition strategy. The regression estimate for Culture Fit in the Culture Fit → Acquisition Success link was the highest in all four models of all acquisition strategy dimensions. The author concludes that high Culture Fit leads to greater acquisition success. This finding is consistent with previous research (Chatterjee 1992, Webber, Shenkar and Raveh 1996). As Beau Parnell, Cisco HR director commented, "You can not overemphasize the importance of chemistry in determining the suitability of an acquisition" (Paulson 2001).

Author's results suggest that the smaller the size of the acquired company and the greater the retention rate of the acquired company's employees, the greater the success level of the acquired company. This finding is consistent with previous study (Mayer 2002). Some research shows opposite result (Larsson and Finkelstein 1999). They drew the conclusion based on the acquisition study of traditional industry from 1960-1995 which has different characteristics from today's hi-tech industry.

It is not clear whether or not the distance between the location of the closest Cisco division and the location of the acquired company affects acquisition success.

6.4 Key Findings

The key findings of this study are four:

- The dimension that affects acquisition success the most is culture fit – the extent to which the acquired company's culture fits Cisco's culture
- The greater the fit between the acquired company's culture and Cisco's culture, the smaller the size of the acquired company, and the greater the retention rate of the acquired company's employees, the greater the success of the acquisition
- Acquisition experience and the market index affect culture fit; the greater the experience a company has and the higher the market index, the lower the fit between Cisco's culture and the acquired company's culture

- Market index affects the retention rate of an acquired company's employees;
the greater the market index, the lower the retention rate

These four key findings are illustrated in Figure 3.

Figure 3: Key Findings of the Research Study

In this study, the author found size is inversely proportional to acquisition success. This result contradicts results in the existing literature. Ravenscraft and Scherer (1987) argued that mergers and acquisitions of small companies may not receive sufficient managerial attention to turn potential synergies into realized ones. Larson and Finkelstein (1999) support existing findings that without the necessary critical mass, relatively small acquisitions are less likely than larger mergers and acquisitions to offer the full range of combination potential which decreases the likelihood of success. The author surmises that the reason for this contradiction is due to the fact that previous research studies focused

on traditional industries not hi-tech industries like telecommunications. For technology innovation oriented acquisitions, acquired people are the main asset of the acquired company (Paulson 2001). The capabilities of the employees of the acquired firm are critical for the acquisition success. Small companies and start-ups with mainly engineers and no overlapping departments expect minor changes to occur. Thus, they are easier to manage and integrate into the acquirer's organization (Mayer 2002).

7. CONCLUSIONS, LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

This research examined the relationship between the dimensions of acquisition strategy that affect acquisition success and the relationship between firm-level and market-level factors that affect acquisition strategy. Six hypotheses were developed and tested using data on the acquisitions made by Cisco from January 1993 to May 2003.

Results suggest that:

- Culture fit affects acquisition success more than the other dimensions of acquisition strategy; high culture fit increases the likelihood that the acquisition will meet the objectives for which it was acquired
- Size and Retention also affect acquisition success, smaller size and higher retention increase the likelihood of success
- Acquisition experience and the Market index affect Retention; High acquisition experience increases employee retention while high market index decreases it
- Market index affects culture fit; high market index decreases the fit between the bidder's culture and the acquired company's culture

This thesis expands the knowledge about acquisitions of technology companies. It contributes to the knowledge of the antecedents and consequences of the dimensions of acquisition strategy using data from one company.

Existing research tends to build highly conceptualized acquisition models that are theoretically sound but are not practical. This thesis developed a structural model that can be used to direct acquisition practice.

This thesis is the first empirical study that relates firm-level and market-level factors to acquisition strategy. Existing research focuses more on acquisition strategy and acquisition performance. There are very limited studies that have been done on identifying firm-level and market-level factors and examining how they affect acquisition strategy.

7.2 Limitations

This study has at least two limitations. First, while this study uses the literature to identify the dimensions of acquisition strategy and the firm-level and market-level factors that constrain it, the hypotheses were tested using acquisition data from only one company, Cisco Systems Inc. Thus, the author cannot claim that these results apply to other companies in the telecommunications industry or companies in other industries.

The second limitation of this study is that only one person provided the ratings used to measure acquisition success and culture fit. This is unfortunate, and may have resulted in the high correlation between these two variables. The author tried to obtain multiple respondents to provide these ratings with no success. The lack of success was due to the fact that there very few people working at Cisco today have working knowledge on all the acquisitions that occurred from January 1993 to May 2003. Since Cisco keeps track of each acquisition and archives associated information, the rating is not just based on the respondent's memory. It is based on the respondent's knowledge about Cisco's acquisition activities and archived information.

7.3 Suggestions for Future Research

Future researchers can consider extending this study in two directions. First, researchers can add more firm-level factors to the one used in this research. Other firm level factors may include liquidity, past performance, and attributes of the management team. These firm-level factors may be more relevant when examining the relationship in Figure 1 using data from a cross section of companies rather than data from one single company.

Secondly, researchers can examine if the acquisition success model developed in this thesis applies to companies in other industries other than telecommunications.

Given that the results suggest culture fit affects acquisition success more than the other dimensions of acquisition strategy, future researchers could examine culture more

carefully. Instead of measuring culture fit by using one high-level construct, culture fit can be assessed at the level of sub-constructs (Schein 1999) such as artefacts (e.g., visible organizational structures and processes), espoused values (e.g., strategies, goals and philosophies), and shared tacit assumptions (e.g., unconscious, taken-for-granted beliefs, perceptions, thoughts, and feelings).

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APPENDIX A Cisco's Acquisitions Chronology since 1993

Table 18: Cisco's Acquisitions Chronology since 1993

Trans No.	Acq. Company Name	Acq. Announcement Date	Acq. Valuation (M)	Acq. Expense Per Employee (M)	Num. of acq. Employees	Location of Acq. Firm
1	Crescendo Communications	21-Sep-1993	\$95	\$1.46	65	Sunnyvale, CA
2	Newport Systems Solutions	12-Jul-1994	\$93	\$1.69	55	Newport Beach, CA
3	Kalpana	24-Oct-1994	\$240	\$1.60	150	Sunnyvale, CA
4	LightStream	8-Dec-1994	\$120	\$2.00	60	Billerica, MA
5	Combinet	10-Aug-1995	\$132	\$1.32	100	Sunnyvale, CA
6	Internet Junction Networks	6-Sep-1995	\$6	\$0.60	10	Mountain View, CA
7	Grand Junction	27-Sep-1995	\$400	\$4.71	85	Fremont, CA
8	Network Translation	27-Oct-1995	\$32	\$3.20	10	Palo Alto, CA.
9	TGV Software	23-Jan-1996	\$138	\$1.06	130	Santa Cruz, CA
10	StrataCom	22-Apr-1996	\$4,666	\$7.47	1,200	San Jose, CA
11	Telebit MICA Technologies	22-Jul-1996	\$200	\$0.69	288	Chelmsford, MA
12	Nashoba Networks	6-Aug-1996	\$100	\$2.50	40	Littleton, MA
13	Granite Systems	3-Sep-1996	\$220	\$4.40	50	Palo Alto, CA
14	NETSYS Technologies	14-Oct-1996	\$79	\$1.58	50	Palo Alto, CA
15	Metaplex	1-Dec-1996	\$2	\$0.10	20	RTP, NC
16	Telesend	26-Mar-1997	\$6	\$6.00	32	Cupertino, CA
17	Skystone Systems	9-Jun-1997	\$102	\$2.55	40	Ottawa, ON, Canada
18	Ardent Communications	24-Jun-1997	\$156	\$3.90	40	San Jose, CA
19	Global Internet Software	24-Jun-1997	\$40	\$2.00	20	Palo Alto, CA
20	Dagaz Integrated Network	28-Jul-1997	\$126	\$4.20	30	Bridgewater, NJ
21	LightSpeed	22-Dec-1997	\$194	\$2.77	70	Sterling, VA
22	WheelGroup	18-Feb-1998	\$124	\$1.65	75	San Antonio, TX
23	NetSpeed	10-Mar-1998	\$265	\$1.89	140	Austin, TX
24	Precept Software	11-Mar-1998	\$84	\$1.68	50	Palo Alto, CA
25	Class Data Systems	4-May-1998	\$51	\$1.50	34	Ra'anana, Israel
26	Summa Four	28-Jul-1998	\$118	\$0.56	210	Manchester, NH
27	American Internet	21-Aug-1998	\$35.60	\$0.71	50	Bedford, MA
28	Clarity Wireless	15-Sep-1998	\$157	\$4.03	39	Belmont, CA
29	Selsius Systems	14-Oct-1998	\$145	\$1.84	51	Richardson, TX
30	PipleLinks	2-Dec-1998	\$126	\$1.73	73	San Jose, CA
31	Fibex Systems	8-Apr-1999	\$445	\$4.45	100	Petaluma, CA
32	Sentient Networks	8-Apr-1999	NA	NA	102	Milpitas, CA
33	GeoTel Communications	13-Apr-1999	\$200	\$6.45	310	Lowell, MA
34	Amteva Technologies	28-Apr-1999	\$170	\$1.18	144	Glen Allen, VA
35	TransMedia Communications	17-Jun-1999	\$407	\$6.17	66	San Jose, CA

36	StratumOne Communications	29-Jun-1999	\$435	\$5.58	78	Santa Clara, CA
37	Calista	16-Aug-1999	\$55	\$2.75	20	Bucks, England
38	MaxComm Technologies	18-Aug-1999	\$143	\$4.09	35	Chelmsford, MA
39	Monterey Networks	26-Aug-1999	\$500	\$3.79	132	Richardson, TX
40	Cerent	26-Aug-1999	\$690	\$53.08	130	Petaluma, CA
41	Cocom A/S	15-Sep-1999	\$66	\$1.00	66	Copenhagen, Denmark
42	Weblin Communications	22-Sep-1999	\$325	\$2.71	120	Burlington, MA
43	Tasmania Network Systems	26-Oct-1999	\$25	\$1.56	16	Menlo Park, CA
44	Aironet Wireless	9-Nov-1999	\$799	\$6.10	131	Akron, Ohio
45	V-Bits	11-Nov-1999	\$128	\$4.27	30	San Jose, CA
46	Worldwide Data Systems	16-Dec-1999	\$26	\$26.00	15	Howell, NJ
47	Internet Engineering Group	17-Dec-1999	\$25	\$1.92	13	Ann Arbor, MI
48	Pirelli Optical Systmes	20-Dec-1999	\$2,150	\$3.07	701	Milan, Italy
49	Compatible Systems	19-Jan-2000	\$545	\$8.01	68	Boulder, CO
50	Altiga Networks	19-Jan-2000	\$567	\$7.46	76	Franklin, MA
51	Growth Networks	16-Feb-2000	\$355	\$6.70	53	Mountain View, CA
52	Atlantech Technologies	1-Mar-2000	\$180	\$1.50	120	Glasgow, UK
53	Jetcell	16-Mar-2000	\$200	\$4.35	46	Menlo Park, CA
54	InfoGear Technologies	16-Mar-2000	\$301	\$4.07	74	Redwood City, CA
55	SightPath	29-Mar-2000	\$800	\$10.56	76	Waltham, MA
56	PentaCom	11-Apr-2000	\$118	\$2.46	48	Herzliya, Israel
57	Seagull Semiconductor	12-Apr-2000	\$19	\$1.12	17	Herzliya, Israel
58	ArrowPoint Communitions	5-May-2000	\$5,700	\$16.91	337	Acton, MA
59	Qeyton Systems	12-May-2000	\$800	\$15.38	52	Stockholm, Sweden
60	HyNEX	5-Jun-2000	\$127	\$2.59	49	Shefayim Israe
61	Netiverse	7-Jul-2000	\$210	\$6.18	34	San Jose, CA
62	Komodo Technology	25-Jul-2000	\$175	\$7.00	25	Los Gatos, CA
63	NuSpeed Internet Systems	26-Jul-2000	\$450	\$8.04	56	Maple Grove, MN
64	Ipmobile	1-Aug-2000	\$425	\$5.25	81	Richardson, TX
65	PixStream	31-Aug-2000	\$369	\$2.37	156	Waterloo, Canada
66	IpCell Technologies	28-Sep-2000	\$369	\$3.35	110	Richardson, TX
67	Vovida Networks	28-Sep-2000	\$369	\$5.68	65	San Jose, CA
68	CAIS Software Solutions	20-Oct-2000	\$170	\$2.62	65	San Diego, CA
69	Active Voice	10-Nov-2000	\$266	\$0.65	411	Seattle, WA
70	Radiata	13-Nov-2000	\$295	\$5.57	53	North Ryde, Australia
71	ExiO Communications	14-Dec-2000	\$155	\$4.08	38	San Jose, CA
72	AuroraNetics	11-Jul-2001	\$150	\$2.88	52	San Jose, CA
73	Allegro Systems	27-Jul-2001	\$181	\$4.64	39	Milpitas, CA
74	Hammerhead Networks	1-May-2002	\$173	\$2.04	85	Billerica, MA
75	Navarro Networks	1-May-2002	\$85	\$3.40	25	Plano, TX
76	AYR Networks	25-Jul-2002	\$113	\$3.77	30	Palo Alto, CA
77	Andiamo Systems	20-Aug-2002	\$1,200	\$4.44	270	San Jose, CA
78	Psionic Software	22-Oct-2002	\$12	\$1.50	8	Austin, TX
79	OKENA	24-Jan-2003	\$52	\$0.34	153	Waltham, MA
80	SignalWorks	19-Mar-2003	\$13.50	\$1.50	9	Mountain View, CA
81	LinkSys Group	20-Mar-2003	\$181.00	\$0.59	308	San Jose, CA

APPENDIX B Cisco's Financial Performance since 1990 IPO

Table 19: Cisco's Financial Performance since 1990 IPO

Year	Stock Split	Revenues (Millions)	Revenue Percent Growth	Income (Millions)	Income Percent Growth	Earnings per Share	Number of Employees
1990		\$69			n/a		254
1991	2 for 1	\$183	165%	\$43	n/a	\$0.01	506
1992	2 for 1	\$340	86%	\$84	95%	\$0.02	882
1993	2 for 1	\$649	91%	\$172	104%	\$0.04	1,451
1994	2 for 1	\$1,243	92%	\$315	83%	\$0.07	2,262
1995		\$1,979	59%	\$479	52%	\$0.10	3,479
1996	2 for 1	\$4,096	107%	\$913	91%	\$0.15	8,259
1997	3 for 2	\$6,440	57%	\$1,414	55%	\$0.23	10,728
1998	3 for 2	\$8,459	31%	\$1,873	32%	\$0.29	14,623
1999	2 for 1	\$12,154	44%	\$2,567	37%	\$0.38	20,657
2000	2 for 1	\$18,928	56%	\$3,914	52%	\$0.53	34,613
2001		\$22,293	18%	-\$1,014	-21%	-\$0.14	38,402
2002		\$18,915	-15%	\$1,893	286%	\$0.25	35,670
2003		\$18,878	-0.10%	\$3,578	89%	\$0.5	34,466

APPENDIX C Location of the Acquired Companies

Table 20: Location of the Acquired Companies

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Sub total	Percent
California	1	2	4	4	3	3	7	8	2	2	2	38	47%
Massachusetts		1		2		1	3	3		1	1	12	15%
Texas						3	1	2		2		8	10%
Other States				1	2	1	4	3				11	14%
Outside US					1	1	3	7				12	15%
Sub. total:	1	3	4	7	6	9	18	23	2	5	3	81	100%

APPENDIX D Size of Acquired Companies

Table 21: Size of Acquired Companies

Number of Employees of Acquired Companies	< 100	100 - 200	> 200
Total number of Acquisitions	59	13	9
Total percentages of Acquisitions	73%	16%	11%

APPENDIX E Questionnaire

This questionnaire has been designed so you could complete and return it electronically. Once you have completed the questionnaire, save your answers and attach the file as a reply to the e-mail sent to you originally.

There're grand total of 81 acquisitions in Cisco's history. Questions need to be answered for each acquisition. There're only 2 questions per each acquisition in this questionnaire.

Questions about the survey process or content should be directed to: hqin@cisco.com

ALL RESPONSES WILL BE KEPT CONFIDENTIAL. The research results will be sent to you once they become available.

Thank you for collaborating in this research effort.

Acquisition 1: Crescendo Communications, September 21, 1993

Q1. This acquisition met its objective

1 Strongly Disagree	2 Disagree	3 Will not go along	4 Probably will go along	5 Will go along	6 Agree	7 Strongly agree	0 Don't Know

Q2. At the time of the acquisition, the target firm's culture was compatible with Cisco's culture

1 Strongly Disagree	2 Disagree	3 Will not go along	4 Probably will go along	5 Will go along	6 Agree	7 Strongly agree	0 Don't Know

Acquisition 2: Newport Systems Solutions, July 12, 1994

Q1. This acquisition met its objective

1 Strongly Disagree	2 Disagree	3 Will not go along	4 Probably will go along	5 Will go along	6 Agree	7 Strongly agree	0 Don't Know

Q2. At the time of the acquisition, the target firm's culture was compatible with Cisco's culture

1 Strongly Disagree	2 Disagree	3 Will not go along	4 Probably will go along	5 Will go along	6 Agree	7 Strongly agree	0 Don't Know