AN EXAMINATION OF ELECTRONIC COMMERCE AND THE INTERNET:
ROLE OF TECHNOLOGY, CRITICAL SUCCESS FACTORS
AND BUSINESS STRATEGY

DISSERTATION

Presented to the Graduate Council of the
University of North Texas in Partial
Fulfillment of the Requirements

For the Degree of

DOCTOR OF PHILOSOPHY

By

Sharon W. Tabor, B.A., M.B.A.

Denton, Texas

December, 1997
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Electronic commerce is a dynamically evolving business methodology that is changing the context and boundaries of markets and technology. As its use increases, however, questions arise as to how companies are measuring the success of this new market medium, and if the appropriate strategy is driving the growth. Research in this area can help determine whether Internet commerce represents incremental competitive advantage, an extension of traditional business processes, or a paradigm shift in the structure of electronic markets and the use of information technology.

This research employed the case study methodology to examine the issues, challenges, and project lessons learned for a large firm engaged in electronic commerce on the Internet. Organizational drivers, the role of technology, strategy employed, and critical success factors were explored. Additionally, customer impact and satisfaction with electronic commerce transactions were measured. Evidence was gathered using multiple sources and methods including a pre-interview questionnaire and structured interviews with the firm's project team and management and a web-based customer survey linked from the firm's electronic commerce web site.

The study revealed that for this firm, electronic commerce over the Internet is an appropriate and successful tactic in support of the firm's business strategy and low-cost
provider competitive positioning. Evidence supported the synergistic relationship between business strategy and strategic fit for this successful electronic commerce project. The study also determined that depending upon the EC strategy, business processes may be minimally effected, rather than dramatically changed as often predicted in electronic markets.

Additionally, the historical use of technology is not necessarily a predictor of success or failure in electronic commerce. This very conservative user of technology was successful in a new and innovative area that supported its overall business strategy and focused on its core competence. The resulting research model and twenty working propositions provide a basis for further research in other firms and across industry boundaries.
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CHAPTER I

INTRODUCTION

Electronic commerce is a dynamically evolving business methodology that is changing the context and boundaries of markets and technology. Through the use of enabling technologies, the context of electronic commerce has grown from the more finite world of electronic data interchange (EDI) and electronic funds transfer (EFT) with formal business relationships, to a wide range of data, information, and services provided electronically to many parties, both external and internal to the firm. Wigand defines electronic commerce as the "seamless application of information and communication technology from its point of origin to its endpoint along the entire value chain of business processes conducted electronically and designed to enable the accomplishment of a business goal" (1997, p.5). Information retrieval, collaborative workgroup projects, and distance learning are combined with traditional business transactions of selling goods and services across network media, on a local, regional, and global scale through the technology of the Internet.

The changing scope of electronic commerce has been propelled by the rapid growth and acceptance of the Internet and the World Wide Web. Electronic commerce is becoming synonymous with Internet commerce, as traditional EDI partners explore
alternatives to their value added networks (VANs) and businesses of all sizes find access to a global customer base. Evolving from the larger market mechanism of interorganizational systems (IOS), electronic commerce via the Internet is accelerating change in electronic markets and hierarchies as never before. Along with this evolution, the role of technology as an enabler of business strategy also grows.

Problem Definition

The rapid expansion of electronic commerce on the Internet is making news in every form of communication media. Surveys indicate a broad interest in the Internet as an extension of traditional transaction channels and formal Interorganizational Systems (IOS) partnerships (Hayashi 1996; Kantor and Neubarth 1996; Varney and McCarthy 1996). Reports indicate profits are being made (Wilder 1996; Maddox et al. 1996; Radosevich 1996; Glaser 1996; Varney and McCarthy 1996). Financial services, travel, segmented consumer products, and advertising industries are reporting success.

It is unclear, however, how companies are measuring the success of their electronic commerce endeavors, and if the appropriate business strategy is driving the rush to the Internet. One of many underlying concerns is whether Internet commerce can be adequately supported on the existing infrastructure. Additionally, the question exists as to whether electronic commerce on the Internet is right for every business, or only for niche players targeting a specific set of Internet user demographics. Closely tied to these questions about electronic commerce on the Internet is a need to analyze various aspects of this new market medium. The analysis should identify the business drivers and strategy
employed by organizations in choosing to move to the Internet, determine how
organizations define and measure success, define the role of technology in the decision to
pursue electronic commerce, and review the ultimate impact of Internet commerce on
electronic markets and economic activity.

Purpose of the Study

The Internet and World Wide Web, as well as electronic commerce over the
Internet, have been topics of great interest in the media for several years. However, little
in-depth empirical research has been published to date that studies Internet commerce
strategies, success factors, and technology deployment experiences of actual businesses.
Early research efforts remain closely aligned with the foundation fields of electronic
markets and IOS (Bakos 1991a, 1991b; Malone, Yates and Benjamin 1987, 1989;
Applegate 1995; Benjamin and Wigand 1995). Research in the more finite area of Internet
commerce is beginning to appear that reviews electronic commerce and EDI (Hill 1997),
marketing considerations (Hoffman and Novak 1997), consumer adoption, (Jarvenpaa and
Todd 1996) and potential for World Wide Web use (Jarvenpaa and Ives 1996). Other
studies have explored small business adoption factors (Auger and Gallauhger 1997) and
the link between information strategy and electronic commerce, also for small retail
businesses (Lederer et al., 1997).

More research in the focused area of business strategy and electronic commerce
success is needed to examine specific experiences in large firms who have the potential to
become market makers and dramatically effect their industries. Such work will help
determine whether Internet commerce represents incremental competitive advantage, an extension of traditional business processes, or a paradigm shift in the structure of electronic markets and the use of information technology.

Electronic commerce on the Internet has its own unique set of business issues and challenges including security, electronic payments, integration, government regulation, social impact, and technology innovation and adoption. Each of these areas need to be researched. Additionally, unique characteristics of Internet commerce such as transaction cost impact and the roles of intermediaries need investigating.

Significance Of Study

This research examined the use of technology to support business strategy, critical success factors, and customer impact for a large organization using the Internet for electronic commerce. As part of an in-depth field case study, evidence was gathered from the participating organization's project team, management, and customer-users of the organization's electronic commerce web site. Customer satisfaction levels and perceptions, individual electronic commerce participation criteria, and tendency to adopt or reject this method of conducting transactions were collected and analyzed. Of particular interest were the business drivers and strategy initially influencing the case firm in their decision to use the Internet, and the project goals and success measures developed by the organization.

This research answers questions about electronic commerce strategy, identifies key project implementation success factors, and explores tendencies to adopt innovative uses
of technology such as electronic commerce over the Internet. Results of the study extend the body of knowledge on electronic commerce as a business process and explore firm level goals, strategies, and experiences. Businesses that have not yet begun electronic commerce on the Internet will gain a better understanding of success factors, project planning, resources, competencies, and technical issues. The study helps clarify the importance of business strategy for organizations that have a web presence only, as well as those well established in electronic markets. As suggested by Benjamin and Wigand (1995), all stakeholders in an industry value chain should consider whether their position is threatened by electronic commerce and determine an appropriate long-term strategy. The study provides background material for this evaluation process, as well as suggests directions for further research in the area of electronic market mechanisms.
PRIOR RESEARCH

Prior research in electronic commerce evolves around the emergence of electronic markets and electronic hierarchies, Interorganizational Systems (IOS), and the use of technology to achieve competitive advantage. Case studies such as American Airlines (Konsynski 1993; Adcock et al. 1993), McKesson (Clemmons and Row 1988; Oswald and Boulton 1995; Quinn et al. 1994), and Baxter/American Hospital Supply (Benjamin, et al. 1984; Vitale and Konsynski 1988; Konsynski and Vitale 1990) set the stage for the significant role of information technology in achieving competitive advantage. A look at these past cases emphasizes both the nature and pace of today’s technological change. Both American Airlines and Baxter/AHS spent millions of dollars and many years building competitive advantage through their innovative use of technology. Not only did technology improve their internal operations, but it linked them closely to their customers via dedicated transaction terminals. Their business strategy and technical innovation gave them significant competitive advantage while raising barriers to entry for other suppliers in their respective industries (Applegate 1995).

Some of the competitive advantage achieved by American and Baxter has since been surpassed by the continuously changing nature of technology and modern
competitive markets. For the medical supply industry, first through the consolidation of proprietary software and now through global access via the Internet, the market is again open to many vendors of varying sizes. In the realm of computerized reservation systems, AMR's SABRE system was imitated within several years of inception by a major competitor. More recently, Internet access directly to airline reservation systems is changing the nature of the relationship airlines have with their travel agent network. Most major airlines now compete directly with their independent travel networks and are contributing to a unique Internet commerce trend called disintermediation, the bypassing of intermediaries in some stage of the business value chain.

History shows that use of information technology and its timing can impact market structures. Barriers to entry may be raised by firms employing Porter's first mover strategy (1985), that is, being among the first to deploy a new technology strategically. Barriers can also be lowered as transaction costs decrease and technical capabilities evolve. Increased access to technology and skills mean competitive advantage through technology alone is more difficult to achieve than ever before. A competitive technology strategy works best for first movers who use technology to improve customer access to products and services or differentiate their offerings through increased product value. Early Internet commerce adopters are experiencing this advantage, while conducting business in an immature and changing environment.
Competitive Advantage

Michael Porter's classic works on competitive strategy and competitive advantage (1980, 1985) still provide definitive analyses of market forces. Porter proposes that only through appropriate strategy can a firm achieve favorable competitive positioning and profitability in its industry. Part of the firm's strategic goal is to change the rules of the industry in its favor for a potentially higher share of industry profits and return on investment (Porter 1985). This is often accomplished through the use of technology, as in the cases of American and Baxter, and may be seen in various aspects of today's Internet commerce, such as positioning over secure transaction standards, vendor commerce products, and early adopter market dominance.

According to Porter (1985), the rules of competition for any industry are driven by the five forces pictured in figure 1, each with its individual impact on industry players.

![Figure 1. Five Competitive Forces and Industry Profitability (Porter 1985, p. 5)]
These forces impact product price, production and transaction costs, and investment. They may vary by industry, but each market displays them to some extent in their impact on industry participants and profitability. Price, cost, and investment are impacted by industry structure, the underlying economic and technical characteristics of the industry. Buyer power and threat of new entrants impact investment when buyers demand more costly products and services and new entrants drive up the cost of barriers. Cost is impacted by the intensity of industry rivalry, resulting in increased costs of competing in plant, research and development, and sales efforts (Porter 1985).

A key factor in developing competitive strategy is understanding the dynamic elements of the firm’s industry and the determinants that apply to each of the five forces. Table 1 summarizes Porter’s identification of determinants for each of the five forces. Not all determinants apply to every industry, and specific industry characteristics must be addressed with the appropriate strategy.

While acknowledging the importance of satisfying buyer needs, Porter argues the key factor in the ultimate profitability of an industry is the value created for the buyer and the firm’s strategy to capture it. Buyers must be willing to pay a price for a product that exceeds its cost of production. If the firm can capture this value, it will retain more profit than if it must spend dollars fighting off new entrants to the market. The value factor is impacted by each of the five competitive forces, and thus final value ownership lies in the industry structure (Porter 1985).

Porter cites the examples of the automotive and heavy truck industries; both industries provide high value for their buyers, but retain very little of it in the form of
profits. Medical equipment, bond rating services, and initially, oil field equipment, however, were known for retaining value through profits. The oil field services and equipment industry is an example of structure changes through new entrants, declining demand, increased buyer price sensitivity, and eroding product differentiation (Porter 1985).

Table 1. Elements of Industry Structure (Porter 1985, p.6)

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In his work of analyzing the various steps in a firm’s business process, Porter coined the term value chain, a set of both internal and external components of the firm’s
transaction cycle. “The value chain disaggregates a firm into its strategically relevant activities in order to understand the behavior of costs and the existing and potential sources of differentiation” (Porter 1985 p.33). The concept of the value chain plays an important role in understanding buyer search habits and in the ultimate success of a new market mechanism such as electronic commerce.

Flexible strategies and constant awareness of internal process and external industry structure are important to every serious competitor. The value added by each of a firm’s internal attributes is critical to how well it can exploit opportunities and neutralize threats. Managers must constantly evaluate whether or not the firm’s resources and capabilities continue to add value relative to changes in the competitive environment (Barney 1995).

Resources and capabilities of different firms can add value in different ways. Consider Barney’s (1995) comparison of well-known watchmaker brand names Rolex and Timex. Each manufactures watches, but each exploits different valuable resources. While Rolex emphasizes high-quality, precision manufacturing, and a high-status reputation, Timex emphasizes high-volume, low-cost manufacturing skills and abilities. Each company exploits unique competencies in response to competition in its market segment and provides its own form of value within the industry.

Firms will retain value longer if their resources and capabilities are relatively rare and not easily imitated. Valuable, but common, resources result only in competitive parity, while rare or unique resources can provide significant competitive advantage. Imitation is not a trivial undertaking, with resources and capabilities contributing to competitive advantage often proving to be extremely complex. Barney (1995) points out
three aspects of firm resources that can serve as barriers to imitators: the importance of
delay, numerous small decisions, and socially complex resources.

History is the evolutionary process of building the firm’s skills, abilities, and unique
resources, which over time mold a synergistic entity. For example, Caterpillar, Inc. was a
middle market heavy equipment manufacturer until it won a government contract during
the second world war. This experience enabled Caterpillar to develop a worldwide service
and parts supply network for heavy construction equipment. The resulting capabilities
were developed under unique circumstances and the company benefited from government
contacts that could not be replicated by a competitor (Barney 1995).

Big decisions often determine a firm’s future direction; for example, IBM’s
decision to produce the System 360 model family was a major turning point, setting the
company’s development, and typically well publicized. Small decisions are those not generally known
outside the company and rarely documented; they evolve from day-by-day activities and
are the result of how employees do their jobs. These decisions are virtually invisible to
outside competitors and can include issues that would make or break a competitor
atmosphere attempting a duplication strategy. Attitudes toward quality, teamwork, and precision
impact the daily business decisions that guide an organization (Barney 1995).

Socially complex resources can also reduce the chance of duplication. While
reverse engineering can lead to imitated products, organizational phenomena such as
reputation, trust, friendship, teamwork, and culture are often strong competitive tools.
Hewlett Packard, for example, built upon its corporate culture and interdivisional
teamwork to double its market position and achieve leadership in the laser printing field, while not necessarily paying the high costs of continuous innovation (Barney 1995).

A firm's industry position relative to the competition was another of Porter's competitive strategy components. As a measurement of profitability, above-average positioning is the foundation for sustainable competitive advantage. Porter proposes sustainable advantage can usually be achieved through one of three generic strategies: low cost leadership, product differentiation, or focus. Focus has both a cost and differentiation element in serving a narrow range or segment of the industry. A cost leadership strategy must balance product differentiation against the firm's ability to turn cost advantage into higher profits. When concentrating on a differentiation strategy, the firm strives to offer unique aspects of products and services to set them apart from competitors (Porter 1985). Each strategy can be supported in electronic markets through technology to complement traditional business strategy and extend market boundaries.

Technology and Competitive Advantage

The strategic use of technology for competitive advantage has been studied extensively (Bakos and Treacy 1986; Barney 1985; Benjamin et al. 1984; Clemons 1987; Feeney and Ives 1990; Ives and Learmonth 1984; Johnson and Carrico 1988; Kettinger et al. 1994; Parson 1983; Porter and Millar 1985; Rockart and Scott Morton 1984). History has shown that the strategic use of information technology can change existing market structures, create new industries, or act as an equalizer in eroding the competitive advantage of even highly successful firms. With an appropriate strategy and the use of
information technology (IT), the rules of competition as well as industry structure can be changed. Several studies indicate the nature of the industry itself impacts the success of IT as a sustainable competitive tool (Johnston and Carrico 1988; Kettinger et al. 1994).

From Porter's viewpoint, technology impacts each step in the value chain, potentially providing cost savings and contributing to differentiation. On the downside, technology requirements can also increase the cost of doing business for firms that must improve technology to remain competitive. Federal Express is an outstanding example of a firm that changed the structure of its industry through technology. Faster and more reliable small package delivery was made possible by emphasizing technology's role in each step of the value chain, and leveraging the data collected into competitive advantage. Improving business processes with technology gave Federal Express an increased market share and provides timely information services to buyers, while raising costs of entry and ongoing business for competitors (Porter 1985).

Technological change is not necessarily a direct means to competitive advantage. Porter suggests one or more of the following conditions are necessary:

- The technological change itself lowers cost or enhances differentiation and the firm's technological lead is sustainable
- The technological change shifts costs or uniqueness drivers in favor of a firm
- Pioneering the technological change translates into first-mover advantages besides those inherent in the technology itself
- The technological change improves overall industry structure
  (Porter 1985 p. 171-2)

Successful advantage can be claimed if these steps are achieved, if the technology is not easily imitated, or if a new process or value chain step is created or enhanced by the
technology. On the other hand, being the technology leader or first mover is not always the best strategy. According to Porter, the decision of being a leader or a follower is dependent upon the sustainability of the technological lead, coupled with often complicated first-mover advantages and disadvantages (1985).

First-mover advantages are many and include defining competitive rules, establishing a reputation that competitors cannot overcome, gaining unique channel access, defining standards, moving down a proprietary learning curve, favorable access to scarce resources, and early profits. The disadvantages include bearing the burden of pioneering costs, uncertain demand, changes in buyer needs, and low-cost imitation (Porter 1985).

When combined with the use of technology, first mover technical advantage can offer a firm a sustained lead over less proficient competitors. Eric Bloch, Distinguished Fellow, Council on Competitiveness, shared this important view of competition through technology: “Today, success in the global marketplace means creating and applying new knowledge -- which is to say new technologies -- faster than one’s competitors. That is the fundamental law in this competitive world” (Bloch 1996). WalMart with its highly efficient inventory and distribution systems, and Intel with its superior research and ability to turn the next level of processing power into market demand, stand out as excellent examples. Both companies have enjoyed success in their respective industries through their ability to apply technology to critical business processes ahead of and better than their competitors (Price 1996).
Sustained advantage through technology implies either it cannot be easily duplicated, or the firm has chosen a path of constant innovation to stay ahead of competitors. The choice depends to a great deal on whether the technology is internal to the industry. External technologies, those stemming from suppliers, buyers, or other unrelated sources are much harder to sustain. Additionally, the rate of diffusion and life cycle of the leader’s technology is an important consideration in choosing an IT strategy, and in the leader’s ability to maintain its positioning (Feeney and Ives 1990).

Benjamin, Rockart, Scott Morton, and Wyman (1984) further simplify Porter’s framework for using technology for advantage. They suggest senior management focus on two questions regarding the use of technology:

1. Can I use the technology to make a significant change in the way we are now doing business so my company can gain a competitive advantage?

2. Should we, as a company, concentrate on using IT to improve our approach to the marketplace? Or, should we center our efforts on internal improvements in the way we currently carry out the activities of the firm? (Benjamin, et al. 1984 p.7).

The choice of how to strategically employ IT remains a critical decision for organizations. IT may be used to deliver revolutionary new products and thereby impact the industry. Alternatively, IT may be used in business process reengineering to vastly redefine current approaches to internal operations. Benjamin, et al. (1984) explain these choices using classic examples of strategic IT cases shown in the four-quadrant matrix in figure 2.
Industry structure was altered significantly with the introduction of new products such as Gannett's nationally distributed USA Today newspaper, Merrill Lynch's Cash Management Account, and General Electric's Customer Support Center.

<table>
<thead>
<tr>
<th>Significant Structural Change</th>
<th>Competitive Marketplace</th>
<th>Internal Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional Products &amp; Processes</td>
<td>Gannett -- USA Today</td>
<td>Digital Equipment</td>
</tr>
<tr>
<td></td>
<td>Merrill Lynch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>General Electric</td>
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<td></td>
<td>American Hospital Supply</td>
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<td></td>
<td>Bank of America</td>
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<td></td>
<td>Toyota</td>
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<tr>
<td></td>
<td>Xerox</td>
<td></td>
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<tr>
<td></td>
<td>United Airlines</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2. Strategic Opportunities Framework (Benjamin, et al. 1984)

Digital Equipment Corporation chose internal innovation through the development of an expert system configuration tool. Traditional products and processes were altered at American Hospital Supply with the development of their ASAP order entry system. Bank of America developed new approaches to cash management products. Toyota, with their electronically connected dealer network, Xerox, with its automated field service dispatch, and United Airlines through extensive use of teleconferencing, all chose to pursue internal opportunities (Benjamin et al. 1984).

Many of these successful technical innovations started from within the ranks, consistent with innovation research by von Hippel (1978). He concluded that the majority of technical innovation emerges from the creative uses of existing technology. As long as the organization has an environment that supports IT as an important strategic weapon, technical innovation is a likely strategic tool (Benjamin et al. 1984).
Electronic Markets and Electronic Hierarchies

Electronic markets have been studied since the early 1960's, primarily within the context of interorganizational business relationships in industries such as airlines, wholesale drug supplies, and automotive. In 1966, Felix Kaufman coined the term interorganizational system (IOS) and suggested general managers think of the possibilities of networked computers extending beyond their own organizational boundaries. At this time, American Hospital Supply was already exchanging order information with customers across telephone lines, and American Airlines was placing terminals in large travel agencies.

Malone, et al. (1987) defined the way materials and services flow through an electronic value chain as occurring in one of two basic methods: markets, which coordinate the flow through supply and demand forces and external transactions, or hierarchies, with one primary supplier retaining control within the industry. A market arrangement implies many possible suppliers and buyers. Market buyers determine their own level of choice cost in terms of how much information they care to gather and analyze before making a purchase decision. Hierarchies typically restrict the buyer's options and reduce pricing options because of the single predominant supplier. The ultimate market method is usually determined by several inherent aspects of the product. Its uniqueness, or what Malone calls asset specificity, and the complexity of the product description, along with coordination and production costs contribute to price and value components that drive the method.
Products have asset specificity if they cannot readily be used by other firms because of site specificity, physical asset specificity, or human asset specificity. A natural resource available at one site and expensive to move is site specific; a custom-designed machine part is physically specific; specialized skills yield human asset specificity. The more asset specific the good is, the more likely the asset will be acquired through hierarchical market coordination. Likewise, a highly complex product description is often related to specific assets, and the amount of information needed to describe key attributes drives up communication costs. These alternatives are summarized by Malone, et al., in figure 3, which also indicates that quadrant boundaries can be moved, a phenomenon impacted by the use of technology.

![Figure 3. Product Attributes Affecting Organization (Malone et al. 1987 p. 487)](image)

Information technology has played an increasingly important role in creating and growing electronic markets, and assists the economic process by reducing transaction costs for suppliers and search costs for buyers. Within the framework above, IT improves
communication capabilities and allows wider distribution of products and services through the electronic market mechanism. Databases and higher bandwidth capability allow the storage and transmission of more complicated and multi-dimensional product descriptions, causing an upward shift in market boundaries. Similarly, IT improves production to allow more flexibility in product design and manufacture, widening the range of asset specificity handled by market forces (Malone et al. 1987).

More than a decade ago, Malone and co-authors predicted the later stages of electronic market evolution that are occurring today with Internet commerce. They cite the example of airline reservations systems as an industry that moved from a hierarchical single entity to interorganizational through the efforts of major market makers. An intermediate stage in the process was the appearance of a biased market, the tendency of reservation systems to list the major supplier’s flights first, then on to an unbiased market, showing all carrier flights. Their forecast for the future included personalized markets that reduced the alternatives to buyers through use of customized decision aids. The latter is an evolving technology available today within Internet markets through the use of agents, intermediaries, and sophisticated search engines.

Characteristics and Drivers of Electronic Markets

In his research on electronic market behavior, Bakos (1991) suggests that economic models of search affect price, seller profit, and buyer welfare for commodity or differentiated electronic markets. In developing his argument, Bakos presents five
characteristics of electronic markets that explain both their strategic potential and impact on the structure and efficiency of markets (1991, p. 297).

1. An electronic market system can reduce customers' costs of obtaining information about the prices and product offerings of alternative suppliers as well as suppliers' costs of communicating information about their prices and product characteristics to additional customers.

2. The benefits realized by individual participants in an electronic marketplace increase as more organizations join the system.

3. Electronic marketplaces can impose significant switching costs on their participants.

4. Electronic marketplaces typically require large capital investments and offer substantial economies of scale and scope.

5. Potential participants in electronic marketplaces face substantial uncertainty regarding the actual benefits of joining such a system. Occasionally this uncertainty remains even after an organization joins the system.

While developed within the context of traditional IOS or electronic commerce methods such as EDI partnerships, these unique characteristics generally apply to Internet commerce. The possible exception is the third point, and it is entirely possible that switching costs are minimal or non-existent for Internet buyers. In this regard, Internet commerce is changing fairly recent market models and rules of competition.

Bakos suggests that "the reduction in buyer search costs is the single attribute that is most specific to electronic marketplaces" (1991, p. 297). Search costs are directly related to price. When search costs are high, sellers will slightly increase their price knowing that buyers will pay a premium rather than engage in additional costly searches. With computer and telecommunications technology making the distribution of information more efficient, it is reasonable to follow that search costs, and therefore, prices, will be
reduced. When this is the case, some sellers may delay or avoid participation in electronic markets rather than compete on price (Bakos 1991).

The nature of early IOS systems in terms of formal supplier and buyer relationships limited the growth of early electronic markets to major market makers. Bakos writes of the high cost and "major fixed investments in systems development" for the market maker, but that once the systems are developed, "they promise to reduce the marginal costs of interorganizational coordination and handle larger volumes of market transactions in a more timely fashion before they reach their point of saturation" (1991, p. 296).

Just a few years later, the growth of electronic commerce on the Internet is viewed as a natural extension of business processes beyond organizational boundaries, enabled by the use of new and innovative information technologies. With a relatively low cost of entry, electronic markets have the potential to "lower coordination costs for producers and retailers, lower physical distribution costs, or eliminate retailers and wholesalers entirely" (Benjamin and Wigand, 1995, p. 62). Formal relationships are optional rather than required. The ability of electronic markets to improve market efficiency through reduced search costs is totally in the eyes of the beholder. Sellers may experience reduced profits and will need to differentiate to compete in the marketplace; buyers will need to determine a "price and inconvenience" threshold and keep searching until their purchasing criteria is met (Bakos 1991 p. 301). Clearly, the behavior of Internet markets varies from traditional electronic commerce, but to what extent is still unclear.
Electronic Commerce Drivers

Several works have emerged on how different electronic commerce drivers can add value to organizations. Wigand (1997) suggests five different theoretical or conceptual approaches to implementing electronic commerce shown in table 2.

Table 2. Theoretical/Conceptual Approaches to Electronic Commerce (Wigand 1997)

<table>
<thead>
<tr>
<th>Transaction Cost Theory</th>
<th>Economic view of transactions &amp; coordination costs</th>
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</thead>
<tbody>
<tr>
<td>Marketing</td>
<td>Customer, product and profit orientation</td>
</tr>
<tr>
<td>Diffusion</td>
<td>Social process of innovation adoption</td>
</tr>
<tr>
<td>Information Retrieval</td>
<td>End-user orientation to facilitate use</td>
</tr>
<tr>
<td>Strategic Networking</td>
<td>Specific organizational form to carry out economic activities</td>
</tr>
</tbody>
</table>

Analyzing electronic commerce sites and firm experiences from these various perspectives allows us to see if firms have implemented an Internet plan that complements or supports their overall business strategy. A further clarification of each perspective briefly presents Wigand's (1997) interpretation.

Transaction Cost Theory

Transaction cost theory (TCT) supports the emergence of electronic markets and technology through the potential of cost savings in the various steps in the industry's value chain. According to TCT, price consists of three elements -- production costs, coordination costs, and profit margin. Of these, coordination costs are the costs of all information processing activity required to coordinate the work of people and machines that perform primary processes (Malone et al. 1987). The theory simply proposes that firms seek to minimize their transaction costs. A large percentage of a transaction is made up of the search costs of finding products, sellers and buyers, as well as contractual
process costs (Wigand 1997). Electronic commerce can offer significant opportunities for transaction cost savings by reducing both buyer and seller search costs and supplier coordination costs.

Marketing Orientation

The marketing perspective focuses on a defined customer audience. From this view, the firm strives to identify the target consumer, provide products that will fulfill consumer demand, and perform successfully to generate profits. The better the firm can target its audience, identify needs, and provide linkages between the firm and its customers, the more successful it should be. Wigand suggests electronic commerce can provide the direct linkage to the desired audience, serving as "an electronic marketing and information channel" between the firm and its market (1997, p. 9). This strategy is well supported by the Internet, Wigand argues, because of technology that introduces new forms of relationship building. Customization and interactive capabilities further the relationship and add an important feedback loop for further web site customization and enhancement.

Diffusion Theory

Rogers (1995) tells us that diffusion is a special kind of communication that facilitates the spread of an innovation through channels and among members of a social system over time. Evolving from the more formal processes of electronic data interchange (EDI), electronic commerce over the web meets key criteria for diffusion such as time, speed, and cost (Wigand 1997). The web offers an attractive, low cost alternative to face to face communication, while still allowing feedback and a variety of interactive options.
Rogers' (1962) original diffusion work postulated that diffusion follows a five stage model of process adoption as shown in figure 4. Zaltman, et al. (1973) added implementation as the sixth stage element for consistency with other stage models. It appears very similar to the stage hypothesis proposed by Nolan (1973) to explain the evolution of traditional information technology through the firm. In applying the stage model to the adoption of electronic commerce over the Internet, the first interesting variable is the speed with which most firms advance through the stages. The technology of Internet commerce appears to exhibit far more rapid diffusion than that of many other technologies. Also, electronic commerce is an interesting field of study because the technology enabling it is both an innovation and the channel through which diffusion can occur.

Figure 4. Stage Model for Innovation Adoption  (Rogers 1962; Zaltman, et al. 1973)

Wigand (1997) points out that the technology enabling electronic commerce offers the ability to add content rich descriptions often missing in the early electronic markets, and reduces search costs through the use of agents and search engines. Alternatively, web commerce can also increase search costs for buyers not familiar with efficient search
options and methods. Well presented electronic distribution sites allow users to have access to a vast amount of information about products, services, and solutions. Whether internal to the firm, or intended for external users, the potential for electronic information access has been well documented.

Strategic Networking

The concept of strategic networking as a new organization form, distinct from traditional industry structures of markets and hierarchies, is the final possible driver for electronic commerce (Wigand 1997). This new organizational form can be described as "the long-range, deliberate, cooperative, and goal-oriented organizational forms among distinct but related organizations that enable such network member organizations to gain or sustain competitive advantage vis-à-vis their competitors outside the network by optimizing transaction costs and minimizing coordination costs" (Wigand 1997, p. 12). Trust, he states, is an essential element of the network, allowing cost advantages, supporting continued growth, and adding value to all member firms over time (Wigand 1997).

Prior Research Summary

Prior research shows that technology has had a significant impact on markets and industry boundaries. The potential for competitive advantage and transaction cost reduction is high with the appropriate use of technology and the growth of electronic markets is no exception. A business strategy considering Porter's market forces and supported by an appropriate electronic commerce strategy can benefit an organization seeking to expand its market boundaries. History has shown a firm can benefit from
different approaches to the use of technology through either internal or external implementations.

Electronic markets and IOS research have set the stage for explaining the growth of electronic commerce over the Internet. The pace of change and rate of duplication, however, is faster than ever before, making technology alone less of a competitive tool. Instead, organizations must choose an appropriate electronic commerce strategy, weighing their approach in terms of Wigand's options of transaction cost, marketing, diffusion, information retrieval, or strategic networking.
CHAPTER 3

THEORETICAL FRAMEWORK

Much of the theoretical basis for electronic markets and competitive advantage flows from research in microeconomics, with traditional paths in industrial organization (IO) economics, Chamberlinian economics, and Schumpeterian economics (Barney 1986). Electronic commerce is growing as a market mechanism primarily because of the need to continually address the competitive nature of markets. This chapter reviews relevant foundation disciplines and discusses the emergence of research questions and constructs of interest for the case study.

Porter’s competitive market work tends to follow the IO economics path. Originally proposed by Mason (1939) and Bain (1956, 1968), IO economics remains fundamentally unchanged. This early work defined the importance of industry structure in determining returns to the firm, and gave substance to the existence and value of barriers to entry (Bain 1956). Additionally, IO economic theory considers the number and relative size of firms in the industry, the existence and degree of product differentiation, and overall elasticity of demand in the industry (Barney 1986).

The IO model, otherwise known as the structure, conduct, and performance paradigm, was originally developed to assist government policy makers. By
understanding the structure of industries, economic policy-makers could ensure socially acceptable levels of intra-industry competition through regulation. Strategy theorists viewed this initial work and, modifying its intent, determined how firms could maximize economic returns by attempting to alter structural attributes of the industry (Porter 1980).

As in IO economics, Chamberlinian economics seeks to explain strategy and performance, but does so by starting with the firm's unique assets and capabilities. Chamberlin (1933) believed that competition always occurs between firms with different, though potentially overlapping, capabilities and resources. Strategies that alter industry structure through the use of these assets or capabilities give the firm competitive advantage. Some of these key differences might be technical know-how, reputation, brand awareness, and the ability of managers to work together (Chamberlin 1933). Assuming each firm in the industry has unique but overlapping resources and capabilities, Chamberlin proposed that perfect competition could exist. At least some firms in the industry, Chamberlin argued, could attain sustained periods of superior financial performance by exploiting their distinct assets and resources (1933). A strategy to exploit what today are called core competencies will allow a firm to differentiate and obtain relatively high levels of economic return.

When Schumpeter described the development of Western economies in the 1950's, he focused more on the nature of change represented by major revolutionary technologies and product market shifts, rather than price and other competitive actions. Schumpeter's comments in 1950 hold an interesting insight into today's emerging electronic markets:
Capitalism, then, is by nature a form or method of economic change and not only never is but never can be stationary. The fundamental impulse that sets and keeps the capitalist engine in motion comes from the new consumers’ goods, the new methods of production or transportation, the new markets, the new forms of industrial organization that capitalist enterprise creates. This process of Creative Destruction is the essential fact about capitalism. (Schumpeter 1950 82-83).

The unfortunate side of this revelation is that firms can only imperfectly anticipate innovations in product, markets, or technology. Competitive uncertainty dominated the competitive setting of Schumpeter’s time, and is increasingly true today. Schumpeter was ahead of his time in noting that when a major innovation appears, its impact may not initially be obvious. By the time it is recognized, it may be too late for firms with older technologies and skills to compete in new markets requiring new skills. Alternatively, embracing a new innovation too early can effect the firm’s long-term strategy by committing resources to a technology or market that does not become dominant. This is truly the dilemma now facing businesses through the technology and market dynamics offered by Internet commerce.

Critical Success Factors in the Project Context

The critical success factor approach to defining and measuring an organization’s performance to strategy is well-established (Rockart 1979; Bullen and Rockart 1981; Rockart and Crescenzi 1984). Rockart introduced the concept in the late 1970's and defines critical success factors (CSFs) as being "the few key areas of activity in which favorable results are absolutely necessary for a particular manager to reach his goals" (Bullen and Rockart 1981, p. 383). It is common for critical success factors to exist for
an industry, a corporation, a department within the corporation, and for individual
managers fulfilling the corporate strategy. As Rockart (1981) points out, however, CSFs
are subjective judgements, and are not easily defined. Individual perspective and role in
the organization impact how well organizational strategy is translated into operational,
measurable elements of success. The CSF technique has been applied successfully in many
areas of information technology research, including identifying corporate information and
system needs (Shank, Boynton, and Zmud 1985), data management (Guynes and Vanecek
1996), and project management (Slevin and Pinto 1986; Pinto and Slevin 1988; and Beale
and Freeman 1991).

In addition to identifying CSFs, defining project success can prove to be a difficult
problem. Pinto and Slevin (1988) wrote of the diversity of reported project successes in
the information technology area. Any number of IT projects have been considered
successful even though late and over budget. Likewise, other projects coming in on time
and under budget were considered unsuccessful, as defined by a poor reception by clients
and low usage levels (Pinto and Slevin 1988). Organizations must be able to clearly define
and measure the desired state called success to know when it has been achieved, and do so
prior to identifying critical factors for its accomplishment.

While no strong consensus exists in the project management literature on how to
define success, a number of models and techniques have been developed to aid in the
definition and measurement process (Slevin and Pinto 1986; Pinto and Slevin 1988; Beale
and Freeman 1991). There is also a link between choosing appropriate CSFs to engage
management's attention, and their support of the project activity (Rockart and Crescenzi 1984).

Slevin and Pinto (1986) developed supporting criteria for ten factors of project success identified in a prior survey. Their work builds on the process model shown in figure 5 (Schultz and Slevin 1984) and provides a framework for the necessary conditions to be present for project success. They perceive this critical path layout to be important and relevant to successful implementation. A clear mission, top management support, a defined schedule or plan, client consultation, the right personnel, appropriate technology, and client acceptance are defined as CSFs. Communication, monitoring, and feedback are simultaneous process steps, with troubleshooting occurring as needed throughout the implementation.

Figure 5. Ten Factors of Project Implementation Profile (Schultz and Slevin 1984)
Before applying the concept of CSFs at the project level, it may be useful to consider the generally accepted characteristics that the majority of projects exhibit. These apply to technical or non-technical project efforts and include:

- A defined beginning and end (specified time to completion)
- A specific, preordained goal or set of goals (performance expectations)
- A series of complex or interrelated activities
- A limited budget

(Pinto and Slevin 1988, p. 68)

Success will be tied to factors impacting the goals and objectives of each project as they relate to a specific or overall business strategy, and typically deal with the elements of time, budget, and performance. Client satisfaction as a factor appeared in the project management literature of the eighties, and takes its place as a fourth indicator of success (Pinto and Slevin 1988). Satisfaction research takes many directions, but is generally associated with use and effectiveness. These four project success factors appear to be generic and critical elements for any type of project.

Additionally, given types of IS development projects (i.e. decision support systems) are likely to have similar basic goals across organizations or industries. In this work, a major goal is to define the basic CSFs for implementing electronic commerce over the Internet. Whether used as a sole means of conducting business, or of extending business processes to new or existing markets, electronic commerce projects as a group may similarly exhibit success factors equally valuable across organizations and industries. Indeed, much further testing in a continuing research stream will be required to verify CSF applicability.
Measurement plays an important role in tracking aspects of success on both the micro level of a specific project, and the macro level of translating business strategy into results. Research has concluded that:

Organizations which are tops in their industry, stellar financial performers and adept change leaders, distinguish themselves by the following characteristics: having agreed-upon measures that managers understand; balancing financial and non-financial measurement; linking strategic measures to operational ones; updating their strategic scorecard regularly; and clearly communicating measures and progress to all employees.

(Lingle and Schiemann 1996).

Definition of the desired state through careful analysis, plus a viable measurement process, are both important considerations in determining critical success factors.

Business Strategy and the Construct of Fit

Information technology and its importance in implementing business strategy has been a popular research stream (Rockart and Scott Morton 1984; Bakos and Treacy 1986; Child 1987; Lucas 1986; Benjamin and Scott Morton 1988). Jarvenpaa and Ives (1993) viewed IT from a global organization perspective and identified different strategies that could be followed. In one of the few studies dealing with IT impact, they defined a measurement of IT strategy as well as focusing on strategic fit between global business strategy and global IT strategy.

Strategic fit as a measurement of the congruence between business and IT strategy, has also been researched extensively (Henderson and Venkatraman 1989, 1991, 1992; Venkatraman and Camillus 1984; Venkatraman 1989a, 1989b). Venkatraman's work has provided the IS field with defined constructs for strategic orientation and
strategic fit as a means of determining information technology success. The concept of fit comes from the reference disciplines of organizational theory and IO economics. Strategy is typically conceptualized as focusing on content (what should be done), or process (how it should be done). Fit deals with how the elements or resources work together to accomplish the goal (Venkatraman and Camillus 1984). In relation to information technology then, how well IT supports the what should be done aspect of the organization's business strategy is a measure of fit. If IT is successfully supporting business strategy it should prove to be an enabler for the deployment of Internet commerce and play an important role in project success.

Innovation Adoption and Technology Diffusion

Innovation has been widely studied in the management field from varying perspectives. These perspectives include: organizational characteristics that encourage innovation (Damanpour 1991; Cohen and Levinthal 1990); innovation implementation (Klein and Sorra 1996; Brown and Eisenhardt 1995); innovation speed (Eisenhardt and Tabrizi 1995; Kessler and Chakrabarti 1996); innovation imitation (Abrahamson 1991); and innovation diffusion (Rogers 1962, 1971, 1983, 1995; Gatignon and Robertson 1989). The most significant result of these various studies is that results are inconsistent (Wolfe 1994). Innovation and its diffusion remains an extremely complex issue.

Roger's work with diffusion over the last thirty years is widely accepted and includes his model of defined stages in the innovation diffusion process. The stages include awareness, appraisal, adoption, diffusion, and implementation (Rogers 1962; Fiol
Organizational variables such as process, resources, and culture are considered to be related to successful innovation (Damanpour 1991). Time is an important dimension in Roger's view, so the process is highly influenced by the rate of adoption within the social system. Adoption rate will be affected by the five attributes of innovation shown in figure 6, the type of decision, how the innovation is communicated, nature of the social system, and internal support and efforts by the organizational change agent. Tying the time aspect back to Porter's competitive advantage work, one might conclude that highly competitive organizations would tend to be early adopters and have a pattern of rapid innovation diffusion.

<table>
<thead>
<tr>
<th>Variables Determining the Rate of Adoption</th>
<th>Dependent Variable Explained</th>
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<tbody>
<tr>
<td>I. Perceived Attributes of Innovation</td>
<td></td>
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<tr>
<td>1. Relative Advantage</td>
<td></td>
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<tr>
<td>2. Compatibility</td>
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<td>3. Complexity</td>
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<td>4. Trialability</td>
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<tr>
<td>5. Observability</td>
<td></td>
</tr>
<tr>
<td>II. Type of Innovation-Decision</td>
<td>RATE OF ADOPTION OF INNOVATIONS</td>
</tr>
<tr>
<td>1. Optional</td>
<td></td>
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<tr>
<td>2. Collective</td>
<td></td>
</tr>
<tr>
<td>3. Authority</td>
<td></td>
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<tr>
<td>III. Communication Channels</td>
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<tr>
<td>(e.g. mass media or interpersonal)</td>
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<tr>
<td>IV. Nature of the Social System</td>
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<tr>
<td>(e.g. its norms, degree of network inter-connectedness)</td>
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<tr>
<td>V. Extent of Change Agents' Promotion</td>
<td></td>
</tr>
<tr>
<td>Efforts</td>
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</tbody>
</table>

Figure 6. Variables For Rate of Adoption of Innovations (Rogers 1995, p.207)
This study looks at electronic commerce over the Internet as an innovation that is not well defined and is currently erratically implemented. One of the goals of the research is to identify organizational factors such as the past use of information technology, strategic focus, and innovation adoption tendency, and see if there appears to be any patterns that can affect the success of an electronic commerce project.

Implications and Propositions for Internet Commerce

While many analytical articles are appearing, empirical research in the area of Internet commerce is as yet difficult to find. In an electronic working paper, Bloch, Pigneur, and Segev (1996) address the need for research in electronic commerce and offer suggestions for potential research streams. They propose that as a new platform for electronic commerce, the Internet adds value through improving business methods, transforming processes, and redefining business models and product capabilities. Electronic commerce, by their definition, includes the “support for any kind of business transaction over a digital infrastructure” (Bloch et al. 1996 p.2). An important characteristic of electronic markets is their tendency to yield long-term benefits. Organizations seeking a rapid return on investment may be disappointed, as well as those firms that do not adequately understand how to use technology to contribute business value.

Table 3 reflects ten components of business value that Bloch et al., (1996) suggest are impacted by electronic commerce. Other features include the relationship-building potential for buyers and sellers, support for fully digital information exchange, suppressed
time and place limits, dynamic adaptation to customer behavior, and real-time update capabilities (Bloch et al. 1996 p.3).

Table 3. Components of Business Value (Bloch, Pigneur, Segev 1996 5-10)

<table>
<thead>
<tr>
<th>Proposition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Product Promotion:</td>
<td>Through a direct, information-rich and interactive contact with customers, electronic commerce can enhance the promotion of products.</td>
</tr>
<tr>
<td>2. New Sales Channel:</td>
<td>Thanks to their direct reach to customers and their bi-directional nature in communicating information, electronic commerce systems represent a new sales channel for existing products.</td>
</tr>
<tr>
<td>3. Direct Savings:</td>
<td>By using a public shared infrastructure such as the Internet and digitally transmitting and reusing information, electronic commerce systems can lower the cost of delivering information to customers.</td>
</tr>
<tr>
<td>4. Time to Market:</td>
<td>Due to their instantaneous nature, electronic commerce systems allow a reduction of the cycle time associated with producing and delivering information and services.</td>
</tr>
<tr>
<td>5. Customer Service:</td>
<td>Through intelligence built into systems and the extended availability of intelligent support systems, electronic commerce systems can enhance customer service.</td>
</tr>
<tr>
<td>6. Brand or Corporate Image:</td>
<td>Electronic commerce systems will become one of the components of a brand or corporate image, especially while targeting technology-friendly customer segments.</td>
</tr>
<tr>
<td>7. Technology Learning &amp; Organizational Laboratory</td>
<td>Rapid progress in the area of electronic commerce will force companies to adapt quickly and offer them an opportunity to experiment with new products, services and processes.</td>
</tr>
<tr>
<td>8. Customer Relationships:</td>
<td>Electronic commerce systems will allow for more personalized relationships between suppliers and their customers, due to their ability to collect information on customer needs and behavioral patterns.</td>
</tr>
<tr>
<td>9. New Product Capabilities:</td>
<td>The information-based nature of the electronic commerce processes allows for new products to be created or existing products to be customized in innovative ways.</td>
</tr>
<tr>
<td>10. New Business Models:</td>
<td>Changing industry structures and electronic commerce systems allow for new business models, based on the wide availability of information and its direct distribution to end-customers.</td>
</tr>
</tbody>
</table>

Each component of business value evolves from early work by Porter in his study of markets and the value chain, influenced by more recent work on electronic markets by
Bakos (1991) and Benjamin (1995). From these components and general propositions, the authors suggest three consolidated sets of electronic commerce propositions to be considered as candidates for empirical testing (see table 4). Research questions for this study were influenced by this revised set of propositions.

Table 4. Propositions for Electronic Commerce  (Bloch, Pigneur, Segev 1996 p.11-12)

<table>
<thead>
<tr>
<th>Using electronic commerce systems on the Internet....</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposition A1 ...offers a cost advantage through less expensive product promotion (p1), cheaper distribution channels (p2) and direct savings (p3).</td>
</tr>
<tr>
<td>Proposition A2 ...helps a company to differentiate itself not only through price but through product innovation (p9), time to market (p4) and customer service (p5).</td>
</tr>
<tr>
<td>Proposition A3 ...allows for customer focus strategies through better customer relationships (p8).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Using electronic commerce systems on the Internet....</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposition B1 ...allows easier entry into traditionally hard to access markets, due to less expensive product promotion (p1), new sales channels (p2) and reduced capital requirements (p3).</td>
</tr>
<tr>
<td>Proposition B2 ...raises the entry barriers in some markets through extensive customer learning (p8), product differentiation (p4, p5, p9) and experience.</td>
</tr>
<tr>
<td>Proposition B3 ...facilitates the introduction of substitute products in a market due to product innovation (p6).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Using electronic commerce systems on the Internet....</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposition C1 ...makes it easier to suppress an intermediary in a distribution network, due to direct customer contact (p2) and the use of a publicly shared infrastructure.</td>
</tr>
<tr>
<td>Proposition C2 ...makes it easier to become a new intermediary in an industry, by providing an added-value service through information management, such as integrators or re-packagers of more basic services.</td>
</tr>
<tr>
<td>Propositions C3 ...makes it possible to catch up with competitors thanks to the maturity of some technologies and learning experiences (p7), and are critical in not losing ground as market dynamics shift.</td>
</tr>
</tbody>
</table>
Framework for Electronic Markets

Based on the theoretical foundation in microeconomics, Porter's definitions of competitive market forces, and Wigand's suggested approaches to electronic commerce, one can conclude that technology is fulfilling an increasingly important role in restructuring markets through electronic media. Not only are competitive boundaries changing, but the very structure of the firm is changing through the introduction of virtual organizations and increasingly decentralized work forces. By broadening some of Porter's framework to include Bloch, et al.'s characteristics of electronic markets, Venkatraman's concept of fit, and Wigand's guidance on strategy, figure 7 depicts the components of interest in this study.

![Figure 7. Model of Technology and Electronic Markets](image)

The model reflects that when technology is aligned with overall business strategy, IT plays an important role in firm structure by supporting competencies, processes, and strategy. The firm uses technology in its business processes within an industry structure, benefiting from such characteristics as first-mover advantage, the ability to set standards, and access to scarce talents and resources. New markets and relationships with customers are possible and desirable within the context of the competitive industry environment.

Constructs and research questions in the design phase of case research are a tentative starting place for research focus (Eisenhardt 1989). The *a priori* research questions for the study include constructs of interest within the context of economic markets and Porter's value system. The matching of constructs and research questions in table 5 lays the foundation for the logical linking of data to case study propositions, and as suggested by Yin (1994), adds structure to the case study research.

This study focuses on the six constructs shown in table 5 with their associated research questions. The constructs represent three different dimensions or levels of inquiry, two within the firm, and an external dimension represented by the firm's customers. Questions and constructs are drawn from the foundation research areas of strategic fit, innovation diffusion, electronic markets, CSFs, and customer satisfaction and relationship aspects of the electronic commerce proposition sets suggested in current literature.

The first two constructs, strategic fit and innovation adoption tendency, relate to technology at the firm level and explore management perceptions of the fit between IT and business strategy, and the value of the firm's use of IT for competitive advantage. The
third construct addresses the unique characteristics of electronic markets that impact or change the value chain between customer and supplier.

Table 5. Constructs and Linkage to Research Questions

<table>
<thead>
<tr>
<th>Construct</th>
<th>Definition</th>
<th>Variables</th>
<th>Research Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Fit</td>
<td>The degree to which IT is tied to business strategy</td>
<td>Management perception of IT and business strategy alignment</td>
<td>Q1. How are strategic technology fit, electronic commerce innovation and adoption tendency, and Internet commerce success related?</td>
</tr>
<tr>
<td>Innovation/adoption tendency</td>
<td>The firm's tendency to adopt and use IT for competitive advantage</td>
<td>Management perception of IT competitive advantage</td>
<td>Q1. How are strategic technology fit, electronic commerce innovation and adoption tendency, and Internet commerce success related?</td>
</tr>
<tr>
<td>Characteristics of Electronic Markets</td>
<td>Unique attributes of electronic markets and transactions that impact the rules of market structure</td>
<td>Business process change, Disintermediation within transaction chain, Electronic Transaction cost</td>
<td>Q4. How are business processes impacted by electronic markets under the Internet? Q2. What role does technology play in electronic commerce projects? Q5. To what extent does Internet commerce provide a transaction cost advantage over traditional processes?</td>
</tr>
<tr>
<td>Project Success</td>
<td>Project outcomes compared to preconceived or altered goals, targets, and milestones</td>
<td>Management and staff perceptions of success factors, Project performance to goals, Project lessons learned</td>
<td>Q3. What are the critical success factors for successful implementation of electronic commerce Internet projects?</td>
</tr>
<tr>
<td>Customer Awareness</td>
<td>Extent to which firm's customer base is aware of the electronic commerce web site and inclined to use electronic transactions</td>
<td>Reported awareness of firm's electronic commerce web site, Tendency to adopt technology</td>
<td>Q6. How did the firm's customers become aware of its electronic commerce web site?</td>
</tr>
<tr>
<td>Customer Satisfaction</td>
<td>Customer perceptions of electronic transactions with this firm and in general, as well as related to role of intermediaries versus personal control</td>
<td>Reported satisfaction with firm transactions, Perceptions of electronic commerce, Desire for personal control vs. Role of intermediaries</td>
<td>Q7. How satisfied are customers with electronic transactions and their role in the transaction process? Q8. What are customer expectations regarding electronic transactions and electronic commerce web sites?</td>
</tr>
</tbody>
</table>
Success constructs include management and staff definitions of project success and the characteristics they consider critical to the success of an electronic commerce project. Customer constructs are concerned with identifying sources of awareness of the electronic commerce web site, determining satisfaction as measured by web site use, and gathering customer perceptions about electronic transactions with the case firm, as well as a global range of electronic transactions.

The research model and the constructs in table 5 suggest that the degree of success from a new technology is affected by:

- The firm’s willingness to innovate and adopt new technologies
- The impact of technology on firm and market structure
- Technology’s strategic fit within the competitive strategy of the firm
- The firm’s ability to exploit the technology to change market forces
- The acceptance and satisfaction of the firm’s customers

Success with electronic commerce on the Internet for a company, therefore, will most likely be achieved if the Internet strategy is consistent with and complementary to the firm’s overall competitive strategy. Additionally, a firm’s technological history may be important. Consequently, this study examines the following research questions:

1. How are strategic technology fit, innovation and adoption tendency, and Internet commerce success related?
2. What role does technology play in electronic commerce projects?
3. What are the critical success factors for successful implementation of electronic commerce Internet projects?
4. How are business processes impacted by expansion of electronic markets on the Internet?
5. To what extent does Internet commerce provide a transaction cost advantage over traditional processes?
6. How did the firm's customers become aware of its electronic commerce web site?

7. How satisfied are customers with electronic transactions and their role in the transaction process, for example, the loss of intermediaries?

8. What concerns and expectations do customers have regarding electronic transactions and electronic commerce web sites?

These preliminary questions formed the starting point for building a chain of evidence and moving into data collection within the firm and with its customers. The flexibility of the case study method encouraged modification where needed, and data richness allowed the researcher to explore complementary or divergent themes as they were presented.
CHAPTER 4

RESEARCH METHODOLOGY

This research project is a multi-level field case study using direct observation, systematic interviewing, and survey data collection. The relatively new realm of Internet commerce is a real-world, contemporary event that requires focus to understand its dynamics, as suggested in Yin's (1994) definition of case research. While offering the opportunity to do in-depth exploration, case study as a research methodology is still an evolving technique. It lacks codified volumes on experimental design and practical guidelines more traditional methodologies have long enjoyed. Contributions to defining the unique characteristics of case study methods have come from Yin, Bateman, and Moore, 1985; Benbasat, Goldstein, and Mead, 1987; Yin, 1989; Eisenhardt, 1989; Lee, 1989; Yin, 1994; Stake, 1995; and many others. With the work of these researchers, the role of case study as a research tool is becoming better defined and recognized for its rich content and theory building potential.

Research Design

Eisenhardt (1989) provides a practical view of building theory from case study research as summarized in table 6. Her approach adds experimental rigor to the process as she clearly delineates each step of the case method and explains the benefits of each activity. This research study follows Eisenhardt's significant contribution to the case
study method except as noted in italics. Those elements dealing with multiple case sites employing multiple investigators remain for future research.

Table 6. Building Theory from Case Study Research  

<table>
<thead>
<tr>
<th>Step</th>
<th>Activity</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting Started</td>
<td>Definition of research questions</td>
<td>Focuses efforts</td>
</tr>
<tr>
<td></td>
<td>Possibly a priori constructs</td>
<td>Provides better grounding of construct measures</td>
</tr>
<tr>
<td></td>
<td>Neither theory nor hypotheses</td>
<td>Retains theoretical flexibility</td>
</tr>
<tr>
<td>Selecting Cases</td>
<td>Specified population</td>
<td>Constrains extraneous variation and sharpens external validity</td>
</tr>
<tr>
<td></td>
<td>Theoretical, not random, sampling</td>
<td>Focuses efforts on theoretically useful cases—i.e., those that replicate or extend theory by filling conceptual categories</td>
</tr>
<tr>
<td>Crafting Instruments and Protocols</td>
<td>Multiple data collection methods</td>
<td>Strengthens grounding of theory by triangulation of evidence</td>
</tr>
<tr>
<td></td>
<td>Qualitative and quantitative data combined</td>
<td>Synergistic view of evidence</td>
</tr>
<tr>
<td></td>
<td>Multiple investigators</td>
<td>Fosters divergent perspectives and strengthens grounding</td>
</tr>
<tr>
<td>Entering the Field</td>
<td>Overlap data collection and analysis, including field notes</td>
<td>Speeds analyses and reveals helpful adjustments to data collection</td>
</tr>
<tr>
<td></td>
<td>Flexible and opportunistic data collection methods</td>
<td>Allows investigators to take advantage of emergent themes and unique case features</td>
</tr>
<tr>
<td>Analyzing Data</td>
<td>Within-case analysis</td>
<td>Gains familiarity with data and preliminary theory generation</td>
</tr>
<tr>
<td></td>
<td>Cross-case pattern search using divergent techniques</td>
<td>Forces investigators to look beyond initial impressions and see evidence through multiple lenses</td>
</tr>
<tr>
<td>Shaping Hypotheses</td>
<td>Iterative tabulation of evidence for each construct</td>
<td>Sharpens construct definition, validity, and measurability</td>
</tr>
<tr>
<td></td>
<td>Replication, not sampling, logic across cases</td>
<td>Confirms, extends, and sharpens theory</td>
</tr>
<tr>
<td></td>
<td>Search evidence for “why” behind relationships</td>
<td>Builds internal validity</td>
</tr>
<tr>
<td>Entwining Literature</td>
<td>Comparison with conflicting literature</td>
<td>Builds internal validity, raises theoretical level, and sharpens construct definitions</td>
</tr>
<tr>
<td></td>
<td>Comparison with similar literature</td>
<td>Sharpens generalizability, improves construct definition, and raises theoretical level</td>
</tr>
<tr>
<td>Reaching Closure</td>
<td>Theoretical saturation when possible</td>
<td>Ends process when marginal improvement becomes small</td>
</tr>
</tbody>
</table>

A research design using the case study methodology is subject to modification as the study progresses. Eisenhardt suggests that overlapping data analysis with data
collection offers increased flexibility for modifying or adding to the collection process, e.g., probing a particular topic or construct which emerges (1989). Yin, Bateman, and Moore (1985) suggest the case design should as clearly as possible include the following action items: specify objectives and questions of the study and how the method used relates to these objectives or questions; link objectives and questions to the basic unit of study; identify the critical evidence that will support the major propositions of the study; stipulate relevant techniques for analyzing the evidence; provide clear direction for generalizing from the results. Further clarification by Yin enhances Eisenhardt’s process by concentrating on five components of the research design:

1. a study’s questions
2. its propositions, if any
3. its unit(s) of analysis
4. the logic linking of the data to the propositions
5. the criteria for interpreting the findings

(Yin 1994 p.20)

This research study followed the suggestions of both Eisenhardt (1989) and Yin (1994) in identifying preliminary research questions and constructs at the inception of the study. A single case study site was identified that met research criteria of being recently engaged in electronic commerce on the Internet. The case site provides a theoretical, non-random, population sample. Multiple data collection methods were developed that best supported the logical linking of data to propositions as suggested by Yin (1994). These methods included a pre-interview questionnaire, structured interviews with two levels of management and project team members, and a web-enabled customer survey. Both qualitative and quantitative data were gathered from the multiple methods to allow for
triangulation of evidence and stronger grounding of theory as suggested by Eisenhardt (1989). Data collection and analysis overlapped field interaction with the case firm to allow for adjustments or clarification of results as needed. Within-case analysis included searching for patterns and relationships among the data using a qualitative analysis software tool. Data transcription and summarizing activities as part of the analysis process contributed to familiarization and understanding of the data and its context for further analysis. Following the chains of evidence, data were analyzed to present a logical response for each research question, as well as a set of propositions for future research.

Case Study Protocol

A formal case study protocol, included as Appendix A, defines the study purpose, context, survey instruments, field procedures, and case study questions. This documentation served as an initial plan and working field guide for the current study and will be used to replicate the study in future case activity. It documents early activities such as the initial firm contact, survey development activity, contact personnel at the firm, and meeting schedules for structured interviews.

Protocols serve as important tools to increase the reliability of the case study method, according to Yin (1994), and lend structure to an otherwise unstructured methodology. An important component of the case study protocol is the technology pilot plan, the planning and testing document for the web-based survey portion of data collection, included with the survey in Appendix B.
Project Overview and Goals

The primary goal of the study is to examine, within the context of constructs in table 5, a firm's use of the Internet for electronic commerce. Within this broad goal, the research focus includes defining the role of technology and development issues for an electronic commerce project, identifying critical success factors for both a project and the use of electronic commerce as a market mechanism, and exploring customer satisfaction with electronic transactions.

The research questions and constructs of interest for this study were initially broadly defined, building on prior work with IOS, electronic markets, and Porter's work on competitive markets and value chains. While Internet commerce as a market medium is in its infancy, early thinking on the topic (Bloch, et al. 1996) and its relation to IOS (Wigand 1997) leads one to look for similarities and differences with these foundation fields. To explore the questions and constructs thoroughly in a real-world context, a regional airline company (heretofore identified as RAC) in the early stages of Internet commerce was selected as the study site.

Case Firm Demographics

RAC has revenues of $3.4 billion (1996) and over 22,000 employees. The firm's primary business strategy has been to outperform the competition with low-fare, single class service in a point-to-point market niche. The firm currently services 50 cities in 22 states, with an average aircraft trip of 400 miles, or one hour in duration. RAC employs a complementary low-cost operating strategy that is an integral part of the firm's philosophy.
Growth is consistent, yet controlled to ensure the firm can compete on an equal-to or less-than competitor cost basis in any potential market (RAC Annual Report, 1996).

The company selected participates minimally in a major IOS reservation system, with less than 20% of reservation volume flowing from that source. The majority of their business comes through their own internal reservation system and customer service call centers. This independent method of conducting business is important to the firm’s low-cost strategy, and was a critical determinant in the case firm selection. The impact of Internet commerce for such a firm had the potential to be more readily defined than for those firms engaged in a formal IOS or large travel agent network. The firm’s independence may also help account for any industry-specific intervening variables. Once defined, the strategies, goals, and project success should also be more easily measured for such a firm.

The case firm’s fully functional electronic commerce web site was approximately one year old at the time of the study, following one year of experience with a web presence and expanding functionality (see figure 8).

<table>
<thead>
<tr>
<th>11/94</th>
<th>2/95</th>
<th>3/95</th>
<th>5/96</th>
<th>5/97</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot</td>
<td>Management Approval</td>
<td>Launch Improvement</td>
<td>Electronic Ticketing</td>
<td>Improvement</td>
</tr>
</tbody>
</table>

Figure 8. Project Timeline

A pilot for the first phase of the project was launched in late November, 1994, with an operating demo presented to upper management in mid February, 1995. With
senior management funding approval, the Marketing Automation team opened their initial web site to the public in March of 1995. Preliminary information offerings included fare and flight schedule lookup. The next year was dedicated to increasing web site functionality to include a wide array of customer programs and information, leading up to the introduction of online reservations and electronic ticketing capabilities in May, 1996. During this time, hardware, software, and communication solutions evolved to meet increasing user demand and technology options.

Sample Population

The unit of analysis for this case study was a regional airline transportation firm engaged in early stages of electronic commerce over the Internet. A sub-unit of study was the firm's Marketing Automation staff and their efforts in conceiving, planning, designing, and managing the electronic commerce web site for the firm. Data were gathered from project team staff and management pre-interview questionnaire and structured interviews (n = 4), a web-based survey of customers (n = 2,751) currently accessing the web site, and an additional follow-up interview with the Vice President of Marketing. Evidence was gathered on the resulting business impact, project lessons learned, and critical success factors, as well as customer awareness and satisfaction with electronic transactions. The web-based survey measured user experience and satisfaction with the firm's web site, as well as general Internet commerce behavior. Additionally, user demographics were gathered for comparative analysis with other published Internet user studies. Survey
questions also probed user perceptions of electronic commerce transactions and their preferences regarding the role of intermediaries versus personal control.

Measures and Instrumentation

Pre-Interview Questionnaire

The pre-interview questionnaire included as Appendix C was developed to explain the purpose of the research and benefits to the firm, present the human subjects participation text, and gather key perceptions about the firm's business strategy, IS strategy, strategic use of IT, and measure innovation characteristics. In addition to reducing the time commitment for interview sessions, perceptions gathered prior to the structured interviews were less apt to be biased by specific interview questions or researcher interaction.

The questionnaires were faxed to team and management case participants for completion one week prior to the scheduled interview sessions. Questionnaire items measured perceptions of business strategic orientation, IS strategic orientation, and overall IT strategy, which together help to identify the strategic fit between strategy and information technology. Format and item content were based upon prior work with business orientation, IS strategy, and strategic fit by Venkatraman (1985) and Chan (1992), as well as an abbreviated innovation characteristic instrument from Siegel (1978).

The concepts of strategic fit and strategic orientation were defined and tested in the early works of Venkatraman (1984, 1989a, 1989b). His contribution included the identification of six dimensions of strategic orientation, including: aggressiveness,
analysis, defensiveness, futurity, proactiveness, riskiness, and innovativeness (1989b).

Chan (1992) later explored these constructs in more detail, separating defensiveness into internal and external elements based upon Venkatraman's earlier recommendation. Chan developed and validated several lengthy survey instruments upon which the pre-interview instrument questions were based.

The final area of interest in the pre-interview questionnaire were twenty-two items that measure an organization's innovation adoption tendency based upon organization characteristics (Siegel and Kaemmerer 1978). The Siegal Scale of Support for Innovation (1978) contains sixty-one items and was developed for use in an education context. The five dimensions measured include: development, ownership, leadership, norms for diversity, and consistency. The abbreviated item sample included in the pre-interview questionnaire represents examples most applicable to the business community for each of the five dimensions, as verified by a panel of business associates.

Structured Interview Sessions

Interviews with the Marketing Automation manager and three team members were taped in separate thirty to forty-five minute sessions early in May 1997, with a final summary interview with the VP in October 1997. Structured interview questions were developed around the research constructs of interest, a priori research questions, project elements such as the timeline, team composition and preparation, project approach and goals, and perceived project success. The full set of interview questions and their support for research questions appear in Appendix D. Additional questions for the department manager included background on the department and relationships with the IS.
organization and gathered more detailed information on the project goals and drivers. The manager interview also included management perceptions of electronic commerce impact as a business process. VP level questions included strategic approach, concerns and considerations in approving the project, and Internet commerce impact to the firm and industry. Clarification or related questions were added during each interview as appropriate. For example, for a recently added team member, historical project questions were inappropriate and additional technology and general experience questions were substituted.

Web Survey Development and Implementation

The web-based customer survey is partly a measure of user satisfaction. Beginning with this premise, existing user satisfaction instruments from Bailey and Pearson (1983), Ives, Olson, and Baroudi (1983), and Doll and Torkzadeh (1988) were researched to investigate their applicability to external customers. Factors identified by Doll and Torkzadeh (1988) seemed most appropriate to an external customer environment. Their end-user computing satisfaction (EUCS) construct includes component measures of content, accuracy, format, ease of use, and timeliness (1988). These component factors were used to build five point Likert-response satisfaction questions for that section of the web survey shown in Appendix B.

Other web survey questions investigated user satisfaction and experience with the firm's web site, gathered perceptions on other electronic transactions, and collected user demographics in similar form to other published Internet user surveys. Several questions were specifically added at the request of the study firm, such as how the web site was used
and how customers heard of the web site. Three rounds of review and editing occurred prior to the firm's acceptance of the survey content and format. Since the survey was to be promoted and linked from the firm's web site, a professional and businesslike presentation was important. Extra care was taken in the tone of the survey questions, and a statement of anonymity was included to ease customer privacy concerns. A direct return link upon submission was added at the case firm's request. The technology prototype plan for the web survey development and pilot test is included in Appendix B.

The physical web survey was developed using a form building software tool called WebForms by Q&D Software. In addition to generating the required HTML (HyperText Markup Language) code, the tool generated CGI (Common Gateway Interface) script which automatically returned survey respondents to the firm's web site after they submitted the form. The tool offered the significant advantage of semi-automatic importing of the completed responses into a project database. The form resided on a UNIX web server and was directly linked from the firm's Internet web site.

Customers accessing the firm's web site self-selected their participation in the survey and no incentive was offered. When the form was completed by the end user and submitted, survey content was redirected to a POP3 mail server as an electronic mail message, while the end user was returned to the firm's web site. Dial-up access to the research mail account via the WebForms mail client resulted in the automatic examination of each message for appropriate header and trailer information. Those messages successfully identified were automatically downloaded to the tool's database environment on the research data collection system. As messages were accumulated in the WebForms
database, response data were periodically exported to a Microsoft Access database which served as repository for the primary data analysis. Backup copies of each mail response were downloaded using the *Eudora Lite* mail client, and retained in a separate location for archiving purposes. Messages with errors or missing headers that did not automatically download to the database were saved as text files in *Eudora*, reviewed for viable content, and manually imported if salvageable.

Data Analysis and Link to Research Questions

In the case study methodology, both qualitative and quantitative evidence can be gathered. Qualitative data collected through structured taped interviews served as the primary evidence for within-case analysis. Questions built around Bloch et al.'s ten business components served as key indexing dimensions and support for the initial research questions.

From the web survey portion of the study, quantitative results and demographics were compared to available data sets from similar Internet user surveys. Viewing the data by various demographic classifications allowed the use of descriptive statistical methods to report frequency and measure central tendency.

The overall strength of the case methodology, however, lies in analytic generalization rather than statistical generalization. Analytic generalization is said to be appropriate with both single and multiple case studies; it can be used to compare a previously developed theory against the empirical results of a case study, or assist in theory building (Yin 1989). Quality analytic generalization and improved reliability were
achieved by following Yin’s suggested principles of data collection. These principles are shown in table 7 along with the activities and methods from this study that relate to each of Yin’s points.

<table>
<thead>
<tr>
<th>Yin’s Principles of Data Collection (1994)</th>
<th>Study Methods and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Multiple Sources of Evidence</td>
<td>Structured interviews, web survey, firm supplied historical data</td>
</tr>
<tr>
<td>Create a Case Study Database</td>
<td>Taped interviews, case study notes, computerized data analysis tools (NUD.IST) and data repository, web survey database</td>
</tr>
<tr>
<td>Maintain a Chain of Evidence</td>
<td>Case protocol documentation for replication purposes</td>
</tr>
</tbody>
</table>

As pointed out by Miles and Huberman, qualitative data tends to be well-grounded, with “rich descriptions and explanations of processes in identifiable local contexts....With qualitative data one can preserve chronological flow, see precisely which events led to which consequences, and derive fruitful explanations” (1994 p. 1).

Alternatively, they note, qualitative data collection and analysis is time consuming and labor intensive, and researchers are subject to data overload and researcher bias.

Qualitative analysis software from Q.S.R. called *NUD.IST* (Non-numerical Unstructured Data Indexing Searching and Theorizing) was employed in this study to assist with analysis of the structured interview evidence, as well as perform a content analysis on customer survey comments. The software uses database technology to collect and organize documents from various sources including the comments section of the customer web survey and transcribed project team and manager interviews. The *NUD.IST* indexing system supports the development of a hierarchical index tree by allowing the user to arrange and link text units, thereby greatly expediting content analysis. This method
facilitates the use of data reduction techniques of coding and categorizing information units into sub-units by similarity of meaning as suggested by Lincoln and Guba (1985). The goal, they suggest, is to "make sense of the data in ways that will facilitate the continuing unfolding of the inquiry, and, second, lead to a maximal understanding of the phenomenon being studied" (Lincoln and Guba, 1985, p. 224).

Eisenhardt (1989) points out that early identification of the research questions and constructs is helpful in developing interview questions and focusing data collection. Initial constructs and measures shown in table 8 form the foundation for research development. Pre-interview questionnaires measured management and team perceptions of the firm's IT innovation and adoption tendency, and the strategic fit between IT and general business competitive strategy.

The department manager, two members of the initial project team, and one new member were interviewed regarding all phases of the web site project, from idea to implementation and daily management. The VP of marketing was interviewed near the completion of the study regarding his goals for success and future direction. The taped interviews were transcribed into text files and imported into the analysis software. The ability to index and relate interview content to major constructs greatly contributed to the analysis process. The software facilitates traditional analysis methods of pattern matching, content analysis, and triangulation.
Table 8. Constructs and Measures

<table>
<thead>
<tr>
<th>Construct</th>
<th>Variables</th>
<th>Measures</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Fit</td>
<td>Management perception of IT and business strategy fit</td>
<td>Pre-interview Questionnaires Structured interviews</td>
<td>Firm</td>
</tr>
<tr>
<td>Innovation/adoption tendency</td>
<td>Management perception of IT competitive advantage</td>
<td>Questionnaires Structured interviews Demonstrated use of technology</td>
<td>Firm</td>
</tr>
<tr>
<td>Characteristics of Electronic Markets</td>
<td>Disintermediation within transaction chain Electronic Transaction cost</td>
<td>Structured interviews Pre and post web site business processes Cost comparison</td>
<td>Firm</td>
</tr>
<tr>
<td>Project Success</td>
<td>Management and staff perceptions of success factors Project performance to goals Project lessons learned</td>
<td>Structured interviews Site access &amp; activity Statistics Structured interviews with development team</td>
<td>Department</td>
</tr>
<tr>
<td>Customer Awareness</td>
<td>Reported awareness of firm's electronic commerce web site Tendency to adopt technology</td>
<td>Electronic survey of firm customers accessing web site</td>
<td>Customer</td>
</tr>
<tr>
<td>Customer Satisfaction</td>
<td>Reported satisfaction with firm transactions Perceptions of electronic commerce Desire for personal control vs. Role of intermediaries</td>
<td>Electronic survey of customers accessing web site</td>
<td>Customer</td>
</tr>
</tbody>
</table>

Pattern matching involves comparing an empirically based pattern with a predicted one (Yin 1994). Such activity can result in confirmation or in rival explanations. For the web survey portion of this research, demographic user data and user responses about Internet commerce can be compared to prior surveys in this area, thereby strengthening the internal validity of the study.

Content analysis is often defined as a quantitative technique but includes value for qualitative research also (Manning and Cullum-Swan 1994). Particularly with the aid of
analysis software, coding systems can help identify reoccurring patterns and topics from text narratives that might be otherwise missed. The use of NUD.IST greatly supported the content analysis method in this research and also alleviates criticism that the technique disregards context. Through appropriate coding within the software, proper context can be accurately tracked and considered during analysis. The software also contains graphical display features to aid the researcher in reviewing specific content within the context of the overall index tree structure.

Triangulation protocols help support the interpretation of data gathered through several different research methods or data collection techniques (Stake 1995). Identified by Denzin (1978), the four types of triangulation include data source triangulation, investigator triangulation, theory triangulation, and methodological triangulation. Data source triangulation uses multiple sources of data, perhaps at different times or places, or with individuals in different situations and context. Data source triangulation was applied through using multiple interview subjects, and multiple contacts for clarification or additional input as well as feedback on customer survey results. Methodological triangulation uses multiple data collection methods to increase the confidence and support interpretation (Stake 1995). Customer comments from the web survey, for example, support the opinions and perceptions of the firm's design team gathered in the structured interviews, and structured interview responses are supported by team perceptions gathered via the pre-interview questionnaire.
Validity and Reliability

The primary challenge of any research methodology is to create designs with an appropriate degree of construct, internal, and external validity, as well as reliability. These three traditional types of validity, plus statistical conclusion validity for quantitative data, aid the researcher's ability to identify "the best available approximation to the truth or falsity of propositions, including propositions about cause" (Cook and Campbell 1979, p. 37).

Construct validity begins with the identification of appropriate constructs of interest for the study, as well as the use of instruments and measures that accurately operationalize them (Yin 1993). Using multiple measures of the constructs within the study is a recommended method of improving instrument, and therefore, construct validity. The constructs of interest in this study are drawn from related foundation fields to test their applicability in the new area of electronic commerce.

The use of instruments and measures validated in other studies, as well as multiple measures for each construct support construct validity in this study. Effectiveness of the pre-interview questionnaire and web survey instruments was improved by incorporating relevant content from existing validated research instruments. Customer satisfaction elements were drawn from Doll and Torkzadeh (1988). Constructs of business strategic orientation, IT strategic orientation, and strategic fit developed by Venkatraman (1984, 1989) were tested through representative questions from his initial work, and from expanded research efforts by Chan (1992). The innovation adoption segment was based upon work by Siegel and Kaemmerer (1978). Additions or modifications were made as
needed to fully address specific topics such as technology impact and the Internet commerce environment. The web survey went through several iterations of expert panel evaluation, content review by the case firm, and the technical pilot study for operational testing.

Campbell and Stanley (1969) define internal validity as an absolute necessity, "the basic minimum without which any experiment is uninterpretable" (p. 5). Internal validity impacts the researcher’s ability to make a logical determination of causal relationships. Yin suggests that internal validity in the case method can be improved through “the specification of the units of analysis, the development of a priori rival theories, and the collection and analysis of data to test these rivals (Yin 1993, p.40). Yin's recommendations for establishing the unit of analysis were followed. As exploratory research in a new area, however, this work does not deal with established theories, but builds upon research in related fields to lay the foundation for new propositions. Instead, a priori research questions were developed, and data to support them were collected through the stated chains of evidence and analyzed for content and relevant relationships.

External validity, or the ability to generalize the results and conclusions of the study beyond its borders remains one of the most difficult aspects of case research. Yin suggests achieving it "through the specification of theoretical relationships, from which generalizations can then be made" (Yin 1993, p. 40). The goal of this research is, indeed, to explore relationships and further the research in this area through careful analysis and construct definition. The final test of external validity lies in replication.
Yin (1993) proposes that a formal case study protocol and the resulting case
database contributes to acceptable reliability in the research method. The protocol should
allow another researcher to repeat the study and achieve the same results. Accurate
documentation, carefully developed field protocols, and the use of a case study database
for data and process collection in this research all contribute to Yin's suggestions for
adequate reliability.

Additional Considerations for Qualitative Research

Qualitative research does not lend itself to easily meet the requirements and
address the threats of traditional tests of validity. Without the use of formal comparisons,
sampling strategies, and overall experimental control, qualitative studies are often well
underway before the researcher can identify and address alternative hypotheses. Instead,
Maxwell (1996) offers additional types of validity for qualitative research: description,
interpretation, and theory.

Description threats usually result from incomplete or inaccurate data and can be
addressed through audio or video recording of observations and interviews. Interpretation
threats include bringing one's own meaning to a situation, rather than that of the
participants. A typical threat is failing to listen for participant meaning, or asking closed-
ended questions that do not allow the participant to fully expand on and verbalize their
responses. Interpretation threats are minimized by using member checks, going back to
the participant for feedback on data collected and conclusions generated. Theoretical
validity is threatened if the researcher fails to collect or pay attention to contradictory data
or ignores alternative meanings and conclusions (Maxwell 1996).
Audio taping with detailed interview transcription was used in this study to address descriptive concerns. Open-ended questions were carefully developed for the structured interview sessions to support research questions. Participants were encouraged to talk, and in all cases, seemed comfortable in the interview session. Any contradictory information between the pre-interview instrument and structured interview sessions were reviewed with participants for clarification or further explanation using Maxwell's member check recommendation.

Two additional concerns regarding qualitative field research discussed by Maxwell include researcher bias and reactivity, or the possible influence of the researcher on the study setting or participants. If the researcher selects only the data that fit a priori theories or expectations, there is obviously the presence of bias in the study results. This threat was reduced by eliminating upfront theories, preconceptions, or values as suggested in Eisenhardt's (1989) approach to the case study method. Maxwell also suggests the researcher explain any possible biases and how they were dealt with (1996). The structured interview questions for this research were open-ended (see Appendix D). Early questions related to subject and project background to establish rapport and encourage comfortable conversation. Later questions were more closely related to research questions, and encouraged in-depth responses from the interview subjects.

Reactivity in the field is minimal for observation studies, but unavoidable in interview situations, according to Maxwell. What the participant says is a direct result of the questions posed by the interviewer. Again, the use of open-ended questions, ample time for the respondent to complete an explanation, and doing appropriate follow-up and
member checking were techniques employed in this study per Maxwell's recommendations. Asking the same questions of all subjects improved response validity and helped verify historical detail on the project. While the questions may have been biased toward the initial set of constructs, different perspectives were obtained from the various team members. For example, an obvious technical perspective versus a marketing viewpoint was often detectable in the content analysis of responses.

Other methods to improve validity in qualitative research offered by Maxwell include searching for discrepant evidence; triangulation to reduce the risk of chance associations and systematic biases; feedback from others; member checks; rich data, or ensuring the data are detailed enough to reveal a complete picture; quasi-statistics, or the use of simple numerical results derived from the data; and comparison, where multi-site studies are involved (Maxwell 1996). For the analysis of this case firm, a search for discrepant evidence was made between perception data from the pre-interview questionnaire and the resultant interview responses about the electronic commerce project. The measure of strategic fit and past use of technology, for example, were compared to the use of technology on the project to determine if a consistent pattern occurred.

In dealing with the topic of generalization, Maxwell distinguishes between internal and external generalizability. Internal generalizability refers to the conclusion within the context of the study, while external generalizability moves beyond the study's setting. The internal generalizability issue corresponds in Maxwell's mind to Cook and Campbell's (1979) statistical conclusion validity, or how well do the conclusions of the study make sense based on the context and richness of the data? External generalizability, he argues,
may apply to the extent the study has face generalizability, where there is no obvious reason to think the conclusions would not apply. Additionally, as per Yin (1994) and others (Becker 1991; Ragin 1987), the goal of qualitative research is to develop theory that can be extended to other cases. In this context, the case method allows the researcher to study a phenomenon such as electronic commerce in great detail. Conclusions drawn here that are supported by the gathered evidence provide the basis for internal generalizability, and a foundation for further testing in an external setting.
CHAPTER 5

DATA COLLECTION AND ANALYSIS

This chapter presents the chain of evidence for each research question and the quantitative instrument and survey results. In addition, it discusses how the data were analyzed to support research questions and conclusions. Data for the case firm and its customers were collected using a multi-method approach, using both qualitative and quantitative methods. A pre-interview questionnaire measured team and management perceptions of key constructs such as business strategic orientation, IS strategic orientation, use of IT to support strategy, and innovation characteristics. Data on the historical progression of the project plus details about the project goals, drivers, and experiences were gathered retrospectively during the structured interviews. The web survey measured customer satisfaction with the firm’s web site, ticketless transactions, and overall Internet commerce experiences.

Qualitative and Quantitative Data Analysis

Qualitative data were gathered in taped structured interview sessions with three project team members, the department manager, and the marketing vice president. Each interview was transcribed in detail and imported into a qualitative software package (QSR NUD*IST) for collection, indexing and coding, content analysis, and pattern discovery. The software greatly expedited the process of searching for key words and identified the
way the involved actors spoke of their roles, project goals, and outcomes. Pre-interview questionnaires resulted in quantitative, measurable perceptions of the manager and project team regarding key organizational factors and constructs of interest. Means and medians run on the Likert response data yielded summary values for each response item, and an overall grand mean provided a comparative rating for discussion purposes.

The web-based customer survey provided a quantitative picture of customer demographics and satisfaction with both the firm's web site and electronic commerce transactions. Descriptive statistics and response summaries were run on the 2,751 survey responses and provided evidence for research questions 6 and 7. Additionally, a large amount of qualitative data was provided in the high percentage (66%) of customer respondents who indicated perceptions and related electronic commerce experiences by means of the free entry comment section. The comment data were imported into the NUD*IST software package for indexing and content analysis by topic primarily to support research question 8.

Chain of Evidence Discussion

The following section discusses the chain of evidence for each of the research questions. Following this section, data analysis techniques for each of the three collection methods are discussed in detail and quantitative results for the pre-interview survey and web survey are presented in graphical or tabular form.
Chain of Evidence for Research Question 1

The first research question serves as a critical element in defining an electronic commerce business model, and as such is complex and multi-faceted. Its goal is to identify the firm characteristics and the relationships between them that effected the Internet commerce project outcome:

1. How are strategic technology fit, innovation and adoption tendency, and Internet commerce success related?

The first step in gathering data for this research question was to define Internet commerce success for the firm. Structured interview questions were developed to clarify project background and goals and determine the case firm's definition of success. Detailed questions about the Marketing Automation organization and its relation to the IS department, plus technology and strategy related questions were included in the manager and vice president interviews (see Appendix D).

Interview data were coded within the qualitative analysis software to match key concepts in the research questions and constructs of interest in the proposed research model. Multiple queries with NUDIST isolated each instance of a topic's occurrence to aid in the analysis process. Strategic technology fit, or the congruence between business strategic orientation and IS strategy, and innovation adoption tendency were measured through participant responses from the pre-interview questionnaire.

Chain of Evidence for Research Questions 2-3

Research questions 2 and 3 are also elements of the electronic commerce business model and were emphasized in the structured interview questions as noted in Appendix D.
They seek to identify the role of technology in the inception and ultimate success of electronic commerce projects, as well as identify the critical success factors for use of this method of conducting business electronically:

2. What role does technology play in electronic commerce projects?

3. What are the critical success factors for successful implementation of electronic commerce Internet projects?

The discussion of technology in each phase of the project was extracted from the structured interview data by means of the qualitative analysis software. The overall IS strategy of the firm measured by the pre-interview questionnaire provides additional input into this section of the analysis. Critical success factors for project implementation explored in research question 3 were also addressed in the structured interview component. Team member and management responses were indexed from the transcribed data via the coding and query features of the qualitative software. Success factors were also reflected in the customer survey comment text and analyzed accordingly.

Chain of Evidence for Research Questions 4-5

Research questions 4 and 5 deal with key characteristics of electronic markets. The impact on both business processes and transaction cost factors once electronic commerce is implemented tend to be managerial issues which were explored in the structured management interview (see Appendix D):

4. How are business processes impacted by expansion of electronic markets on the Internet?

5. To what extent does Internet commerce provide a transaction cost advantage over traditional processes?
Analysis of interview data revealed both a business and a technical element to the business process issue that was further explored in the team leader session.

Chain of Evidence for Research Questions 6-8

The final three research questions are primarily customer impact issues. Data drawn from the web-based customer survey included information about how customers became aware of the firm's web site, measured their satisfaction with electronic commerce and the loss of intermediaries, and defined customer expectations and value perception:

6. How did the firm's customers become aware of its electronic commerce web site?

7. How satisfied are customers with electronic transactions and their role in the transaction process, for example, the loss of intermediaries?

8. What concerns and expectations do customers have regarding electronic transactions and electronic commerce web sites?

Both quantitative data from survey responses and qualitative data from free-form customer comments revealed customer perceptions of site success and value.

Demographic information gathered from the web survey identified key characteristics of this firm's customer base and allowed comparison to other published Internet user demographics. An initial plan to measure customer awareness of the firm's web site by means of an airport survey was dropped from the case plan due to airport security restrictions.
Pre-Interview Questionnaire Data

The pre-interview questionnaire measured team and manager perceptions of the firm's strategic business orientation relative to its marketplace, the firm's use of IS to support business strategy, the firm's overall use of IS for competitive advantage, and the degree to which the firm demonstrated innovation adoption characteristics. Dimensions of each of the measured constructs in the pre-interview questionnaire are defined by Chan as shown in table 9. The full questionnaire sent to the firm is shown in Appendix C.

Table 9. Dimensions of Business and IS Strategy (Chan 1992 p. 38)

<table>
<thead>
<tr>
<th>Construct and Dimensions</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Strategic Orientation</td>
<td></td>
</tr>
<tr>
<td>Aggressiveness</td>
<td>Push to dominate, i.e. increase market share</td>
</tr>
<tr>
<td>Analysis</td>
<td>Reliance on detailed, numerically oriented studies</td>
</tr>
<tr>
<td>Internal Defensiveness</td>
<td>Emphasis on cost cutting and efficiency</td>
</tr>
<tr>
<td>External Defensiveness</td>
<td>Forming tight marketplace alliances</td>
</tr>
<tr>
<td>Futurity</td>
<td>Forward-looking, long-term orientation</td>
</tr>
<tr>
<td>Proactiveness</td>
<td>First to introduce new products and services</td>
</tr>
<tr>
<td>Riskiness</td>
<td>Willingness to take on risky projects</td>
</tr>
<tr>
<td>Innovativeness</td>
<td>Creativity and experimentation</td>
</tr>
<tr>
<td>IS Strategic Orientation</td>
<td>IS support for business strategy</td>
</tr>
<tr>
<td>IS Strategic Fit</td>
<td>Synergy or coherence between IS strategy and business strategy</td>
</tr>
</tbody>
</table>

While Venkatraman (1985) and Chan (1992) used the strategic measures to determine a relationship to financial performance, this research seeks to identify how firm business and IS strategic orientation and fit relate to successful implementation of an Internet commerce strategy. In exploratory research, these early identified patterns and firm characteristics may later serve as direction and predictors for other firms developing and implementing an Internet strategy.
Table 10 contains the response summaries for team and manager participants for the business strategic orientation construct, with the resulting within group mean and median. Individual questions asked the respondent to rate how important each element of business strategy was to the firm on a one to five scale, with one being very low, and five being very high. One team member new to both the team and company omitted responses for most of the first three sections of the questionnaire.

Table 10. Matrix of Business Strategic Orientation Responses

<table>
<thead>
<tr>
<th>Business Strategic Orientation (relative to marketplace)</th>
<th>(Likert Response for Each Respondent, Group Mean and Median)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Code</td>
<td>Dimension</td>
</tr>
<tr>
<td>---------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>S01</td>
<td>Aggressiveness - AG</td>
</tr>
<tr>
<td>S02</td>
<td>Analysis - AN</td>
</tr>
<tr>
<td>S03</td>
<td>Internal Defensiveness - ID</td>
</tr>
<tr>
<td>S04</td>
<td>External Defensiveness-ED</td>
</tr>
<tr>
<td>S05</td>
<td>Futurity - F</td>
</tr>
<tr>
<td>S06</td>
<td>Proactiveness - P</td>
</tr>
<tr>
<td>S07</td>
<td>Riskiness - R</td>
</tr>
<tr>
<td>S08</td>
<td>Innovativeness - I</td>
</tr>
<tr>
<td>Grand mean</td>
<td></td>
</tr>
</tbody>
</table>

(Note: Mgr = Manager, TL = Team Leader, TM1 = Team Member 1, TM2 = Team Member 2; * 2 month employee; n = 4)

Measurement of the information systems strategic orientation dimension are shown in table 11, again with mean and median responses. Individuals were asked to rate on a one to five scale how well the firm's information systems supported the listed elements of business strategy. A rating of one indicated no support at all, and five indicated a very well supported element.
Table 11. Matrix of Information Systems Strategic Orientation Responses

<table>
<thead>
<tr>
<th>IS Strategic Orientation (use of IT to support business strategy)</th>
<th>(Likert Response for Each Respondent, Group Mean and Median)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Code</td>
<td>Dimension</td>
</tr>
<tr>
<td>ISO1</td>
<td>Aggressiveness - AG</td>
</tr>
<tr>
<td>ISO2</td>
<td>Analysis - AN</td>
</tr>
<tr>
<td>ISO3</td>
<td>Internal Defensiveness - ID</td>
</tr>
<tr>
<td>ISO4</td>
<td>External Defensiveness-ED</td>
</tr>
<tr>
<td>ISO5</td>
<td>Futurity - F</td>
</tr>
<tr>
<td>ISO6</td>
<td>Proactiveness - P</td>
</tr>
<tr>
<td>ISO7</td>
<td>Riskiness - R</td>
</tr>
<tr>
<td>ISO8</td>
<td>Innovativeness - I</td>
</tr>
<tr>
<td>Grand mean</td>
<td></td>
</tr>
</tbody>
</table>

(Note: Mgr = Manager, TL = Team Leader, TM1 = Team Member 1, TM2 = Team Member 2; * 2 month employee; n = 4)

How information technology is viewed by users and its tendency to be used for competitive advantage was measured in section three of the questionnaire, with results shown in table 12. This expansion of Chan's instrument gathered views of IT use in the organization. It measured perceptions of how well both business and technology strategy are defined, as well as how technology is supported by its positioning in the organization and budget. The instrument also measured the firm's tendency to adopt new forms of technology to solve business problems and to what extent technology is used to drive business strategy. Respondents were asked to agree or disagree with the statements, with a rating of one being complete disagreement, and a rating of five being complete agreement.
Table 12. Matrix of Information Technology Competitive Advantage Responses

<table>
<thead>
<tr>
<th>Response Code</th>
<th>Dimension</th>
<th>Mgr</th>
<th>TL</th>
<th>TM1</th>
<th>TM2</th>
<th>Mean</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT1</td>
<td>IT Definition - ITDEF</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>n</td>
<td>3.634</td>
<td>4</td>
</tr>
<tr>
<td>IT2</td>
<td>IT Positioning - ITPOS</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>n</td>
<td>3.557</td>
<td>3</td>
</tr>
<tr>
<td>IT3</td>
<td>IT Investment - ITINV</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>n</td>
<td>3.557</td>
<td>3</td>
</tr>
<tr>
<td>IT4</td>
<td>IT Adoption - ITADP</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>n</td>
<td>2.714</td>
<td>2</td>
</tr>
<tr>
<td>IT5</td>
<td>Early Adopter Status - EAS</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>2.115</td>
<td>2.5</td>
</tr>
<tr>
<td>IT6</td>
<td>IT Evolution - ITEV</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>n</td>
<td>3.915</td>
<td>4</td>
</tr>
<tr>
<td>IT7</td>
<td>IT Driver - ITDRV</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>n</td>
<td>2.884</td>
<td>3</td>
</tr>
<tr>
<td>IT8</td>
<td>Business Strategy Def - BSDEF</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>n</td>
<td>4.642</td>
<td>5</td>
</tr>
<tr>
<td>Grand mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.293</td>
<td></td>
</tr>
</tbody>
</table>

(Note: Mgr = Manager, TL = Team Leader, TM1 = Team Member 1, TM2 = Team Member 2; * 2 month employee; n = 4)

Innovation adoption was measured in more detail in section four of the questionnaire. Table 13 summarizes the responses after the items were sorted by innovation characteristic as identified by Siegel (1978). Questions measured participant perceptions about specific characteristics of firm and industry culture often demonstrated by innovative organizations. These characteristics included leadership, diversity, development, and ownership. Again using a one to five scale, a rating of one indicated complete disagreement with the statement, and a rating of five indicated complete agreement. In several questions reverse scoring was to verify response validity. Results containing reverse scored items are noted in the table, but means were not adjusted.
### Table 13. Matrix of Innovation Adoption Responses

<table>
<thead>
<tr>
<th>Response</th>
<th>Dimension</th>
<th>Mgr</th>
<th>TL</th>
<th>TM1</th>
<th>TM2</th>
<th>Mean</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>IAT7</td>
<td>Consistency - C</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4.229</td>
<td>4</td>
</tr>
<tr>
<td>IAT8</td>
<td>Consistency - C</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4.162</td>
<td>4.5</td>
</tr>
<tr>
<td>IAT9</td>
<td>Consistency - C</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>3.936</td>
<td>4</td>
</tr>
<tr>
<td>IAT16</td>
<td>Consistency - C</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>n</td>
<td>3.915</td>
<td>4</td>
</tr>
<tr>
<td>IAT1</td>
<td>Continuous Development - D</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4.000</td>
<td>4</td>
</tr>
<tr>
<td>IAT2</td>
<td>Continuous Development - D</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4.729</td>
<td>5</td>
</tr>
<tr>
<td>IAT6</td>
<td>Continuous Development - D</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4.729</td>
<td>5</td>
</tr>
<tr>
<td>IAT17</td>
<td>Continuous Development - D</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4.729</td>
<td>5</td>
</tr>
<tr>
<td>IAT3</td>
<td>Leadership - L</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5.000</td>
<td>5</td>
</tr>
<tr>
<td>IAT13</td>
<td>Leadership - L</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4.472</td>
<td>4.5</td>
</tr>
<tr>
<td>IAT14</td>
<td>Leadership - L</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5.000</td>
<td>5</td>
</tr>
<tr>
<td>IAT18</td>
<td>Leadership - L</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4.729</td>
<td>5</td>
</tr>
<tr>
<td>IAT19</td>
<td>Leadership - L</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5.000</td>
<td>5</td>
</tr>
<tr>
<td>IAT4</td>
<td>Norms for diversity - N</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>n</td>
<td>4.217</td>
<td>5</td>
</tr>
<tr>
<td>IAT5</td>
<td>Norms for diversity - N</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5.000</td>
<td>5</td>
</tr>
<tr>
<td>IAT20</td>
<td>Norms for diversity - N</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1.000</td>
<td>1*</td>
</tr>
<tr>
<td>IAT21</td>
<td>Norms for diversity - N</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1.000</td>
<td>1*</td>
</tr>
<tr>
<td></td>
<td>*includes reverse scored questions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.143</td>
<td></td>
</tr>
<tr>
<td>IAT10</td>
<td>Ownership - O</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>3.936</td>
<td>4</td>
</tr>
<tr>
<td>IAT11</td>
<td>Ownership - O</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4.729</td>
<td>5</td>
</tr>
<tr>
<td>IAT15</td>
<td>Ownership - O</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4.472</td>
<td>4.5</td>
</tr>
<tr>
<td>IAT22</td>
<td>Ownership - O</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4.229</td>
<td>4</td>
</tr>
<tr>
<td>IAT12</td>
<td>Ownership - O</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1.861</td>
<td>2*</td>
</tr>
<tr>
<td></td>
<td>*includes reverse scored questions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.658</td>
<td></td>
</tr>
</tbody>
</table>

(Note: Mgr = Manager, TL = Team Leader, TM1 = Team Member 1, TM2 = Team Member 2; n = 4)

### Structured Interviews

The structured interviews conducted with the project team's three members and their manager were critical for gathering data about the project's historical development, identifying initial and evolving project goals, and defining the firm's perspective of success.
Project lessons learned speak to the technical issues and challenges of Internet commerce, while the management view of the impact and future of Internet commerce reveal important factors for future research. The upper management interview with the vice president of marketing supported his team's view of their project goals and success, plus provided added detail on the project decision process and the future of electronic commerce.

Interviews were transcribed from tape with full conversational detail, pauses, and interruptions. Once recorded tapes were transcribed into word processing text files, a coding scheme to distinguish between speakers and an appropriate text unit was defined. The initial choices made in setting up the interview text impact the researcher's ability to identify data for coding, searching, and analysis in the qualitative analysis software. In this study, a text unit was defined as each interview question and its accompanying response. The software facilitated analysis of responses by individual, question, or topic. Summary responses were available many ways, including by topic or by functional responsibility.

NUD.IST is a very versatile software tool that allows the researcher to develop a preliminary categorization plan called an index tree, or begin coding and later define the structure. In keeping with the initial case protocol, this study included a conceptual model and set of constructs that became the basis of an index tree for coding purposes. Where more detail or additional questions yielded divergent data streams, additional nodes or branches were added to the tree as shown in Appendix E.

Working with the imported text files, each question and corresponding response were coded to one or more nodes based upon content. Additional consolidation of
interview responses by key word was available through text search and query features in
the software. Text search capabilities can also assist with automatic coding in that the
results of a query may be copied to a new or existing index node. Alternatively, query
features aid in key word search and consolidation of responses through exclusion
parameters. Features of the software include a 'spread' capability, which allows adjacent
comments or questions to be viewed together as needed during the query review process
for a better contextual picture of the topic at hand. Text search results may be saved for
further analysis, printed, or exported to word processing software for additional
formatting options.

An example of the manager interview node structure is shown graphically in figure
9, with a full set of the index tree diagrams included in Appendix E. For purposes of
formatting and displaying the index diagrams, the NUDIST index tree file was exported to
another qualitative software package called Inspiration. The latter's visual and graphical
capabilities are superior for selected printing of complex tree diagrams in both macro and
detail views, as well as for its primary purpose of concept mapping.

Working from the interview content coded at each construct node, adding
additional nodes where analysis revealed finer granularity would be useful, and performing
text queries as needed, all relevant interview question responses and comments can be
viewed and carefully analyzed. This process tended to be highly iterative, since not only
content but context of the response need to be considered.
Using the software tool and the iterative search process, each research question was addressed by accumulating relevant text responses, analyzing the text, and displaying representative supporting text in a matrix presentation format. Following the advice of Miles and Huberman (1994), this study presents qualitative data in a variety of display formats to aid in analysis and support conclusions.

Web Customer Survey

The customer survey developed for this study was the first formal effort to measure customer impact since the inception of the firm's electronic commerce web site. A previous customer survey conducted by the project team gathered initial consumer
response to the idea of web site information and reservation booking, but data was no longer available. A copy of the survey is included as Appendix B.

The web survey was linked to the firm's home page for thirty-four days, from May 20 through June 23, 1997. During this time, an average of 100 responses per day were received. IP address information in the message header allowed the identification and elimination of duplicate responses. Blank or otherwise corrupted messages and duplicate submissions accounted for a 20% reduction of the gross survey quantity. The mechanics of the survey, as noted, included the CGI script to return the user to the firm's web page upon completion and selection of the submit button. Delays in connecting back to the firm site resulted in users submitting the form as many as four times, as they experienced extended response times across the Internet backbone.

Data from the web survey were accumulated in a Microsoft Access 5.0 database during the survey collection process. Exporting the data from the tool to Access in manageable quantities facilitated the identification of duplicates or otherwise unusable responses. The check-box and radio button format common to HTML web-based forms presented some interesting data issues. For example, Access converted the survey check box and radio button responses automatically to a series of yes/no check boxes within the Access database design structure. For counting and analysis, however, recoding was necessary to convert the yes/no selections to workable numeric values.

The survey data were initially stored as a single data table in the WebForms tool, which necessitated reorganization into an appropriate database structure in Access for more efficient querying and reporting. Data preparation, therefore, became the most time
consuming aspect of the web survey. Once completed, descriptive statistics were compiled on key demographic factors, as well as summary data for customer satisfaction items and Internet shopping characteristics. Key demographics for the firm's customer population were compared to overall Internet survey respondent characteristics collected over three years at the Graphics, Visualization & Usability Center (GVU) at the Georgia Institute of Technology (Pitkow 1996). This comparative look at the study's survey respondents provides a perspective for considering the validity and generalizability of the study sample and results. Although they were self-selected, the survey respondents for this study compared favorably to the overall population of Internet users responding to the GVU and other survey series.

Demographic Analysis of Web Survey Respondents

Responses received during the survey period averaged 100 per day, with slight variations by day of week. A total of 3,444 responses were received, with approximately 20% of the total representing duplicate submissions, corrupted messages, or otherwise unusable responses. A total of 2,751 surveys are included in the results analysis. As with any survey tool, individual elements of the survey were completed at the customer's preference, resulting in varying numbers of responses (n) for the different demographic items and questions.

A surprising number of respondents totaling 1,824 (66.3%) completed the free-form comment section. Of the usable survey responses, 94 surveys were submitted with comments only, by customers who employed the survey as a communication medium in the absence of other options from the firm's web site.
Gender

Gender was reported by 98.5% of respondents resulting in a return of 34% female and 66% male. This ratio is consistent with overall Internet user statistics reported by the GVU as 31.4% female and 68.6% male.

Figure 10. Response by Gender (n = 2,532)

Age

Survey data across time have shown the average age of Internet users is increasing, with GVU reporting an average user age of 34.9 (1996). As shown figure 11, while 21 to 34 is the largest single group represented, 58.9% fall in an over 35 range.

Figure 11. Response by Age Group (n = 2,732)
Education Level

RAC survey respondents are well educated, with 81.1% reporting some college or college degrees, considerably higher than the 56.1% with a college education in the GVU survey (see figure 12). It is unknown whether this is characteristic of the customer set most likely to embrace a new technology such as electronic commerce, or that they are more likely to respond to surveys.

![Education Level Graph](image)

Figure 12. Respondent Education Level (n = 2,487)

Internet Experience

Respondents were typically experienced Internet users, with 76.6% reporting online experience of 1 year or more, and 27.4% reporting over 3 years, as shown in figure 13. This demographic appears to influence user expectations about what they like to see in a web site and gives ample grounds for comparison to competitive web sites.
Site Access

More than 50% of respondents report they access the Internet from their homes, (see figure 14) somewhat less than the 63.6% reported by GVU for Internet users overall. Use of the site to reserve business travel would tend to account for some of this difference, with 33.2% reporting office access, a small percent (1.1%) reporting to be mobile workers, and those typically accessing the site from both home and office at 4.8%.
Respondent Occupations

Half of the respondents shown in figure 15 reported having professional or management level job positions, followed by those in computer related professions (17.4%). The 'other' category included creative titles such as Domestic Engineer, Surfing Mom, and a variety of self-employed titles.

![User Occupations Chart](chart.jpg)

**Figure 15. Respondents by Occupation (n = 2,516)**

Customer Site Awareness

A common dilemma of electronic commerce is making the desired population aware of the presence of the site and its capabilities. As figure 16 indicates, a broad spectrum of methods contribute to RAC's awareness efforts.
Figure 16. How Respondents first Learned of the Site (n = 2,438)

Usage Time

The majority of survey respondents shown in figure 17 have been visiting the firm's web site for less than one year, with 21.7% completing the survey on their first visit.

Figure 17. Length of Time Accessing the Site (n = 2,549)
Booking Experience

A customer's overall experience with a product or organization strongly effects their satisfaction at a given point in time. Customers who have completed transactions on the RAC site generally assigned positive ratings to key satisfaction factors. The listed factors are drawn from a validated information system user satisfaction instrument (Doll and Torkzadeh 1988). When their overall experience is favorable, customers are more apt to be forgiving of occasional service problems, as revealed in user comments. For the following satisfaction factors, an average of 1,532 responses were recorded, representing 55.7% of total survey respondents.

Site users typically complete reservations for themselves, or for themselves and a traveling partner, as reflected in figure 18. Personal travel was reported only slightly more often than business travel. Approximately 21% of respondents reported completing a transaction on this visit.

Figure 18. Transaction Characteristics for those Completing Reservations (n = 1,532)
Users were asked to rate their satisfaction with various aspects of the reservation transaction process using a scale of 1 to 5, with 5 being very satisfied. They tend to be satisfied with the timeliness and usefulness of site content in terms of supporting the ticketless transaction.

Users felt they understood the transaction process and that the web site was easy to use.

Those customers who have booked a ticketless transaction do not appear to have the security concerns of those who have not yet adopted Internet commerce as shown in figure 23. Transaction output (figure 24) in the form of printed or faxed confirmations appears to be satisfactory for the majority of users.
Personal control of the transaction process and accessing the web at their convenience received high satisfaction ratings from users.

Those who have completed ticketless transactions generally are satisfied with process speed, although a higher level of dissatisfaction (14%) for this factor than for others was also recorded. Users generally felt confident the system would work.
Reasons for a decision not to book through the web site was also asked of survey respondents with the results shown in figure 29. Reasons in the 'other' category included not having a Netscape browser, corporate or government travel policies, concern over fare discrepancies, desiring to use flight credits, or multiple segments booking requirements.

Figure 29. Reasons for not Completing a Reservation (n = 1,343)

RAC customers also tend to conduct other Internet electronic commerce transactions, purchasing a wide range of goods and services. A look at the 'other' category in figure 30 reveals the diversity of products and services available today over the Internet. Big ticket items such as cars, washer and dryer, and time share reservations are supplemented with firearms, bible study aids, pet supplies, and popular collectable stuffed animals. Hotel and car reservations were additional popular options.
Data Collection Summary

The chains of evidence for the *a priori* research questions were well supported by the mixed data collection methods employed. Qualitative data provided an in-depth look into the project drivers, goals, and success measures, with web survey comment responses revealing important information about customer perceptions of electronic commerce transactions. Quantitative data came from the pre-interview questionnaires and provided perception measures about the firm and its typical use of technology, as well as its strategic positioning, and innovation characteristics. The web survey response level was satisfactory to give a general picture of the firm's customer base, and revealed interesting
demographics about their education, professions and use the Internet. Demographic data compared favorably to other Internet user surveys, and supported the use of the self-selected survey mechanism.
CHAPTER 6

FINDINGS, LIMITATIONS, AND FUTURE RESEARCH

Exploratory research that studies a new technology or phenomena is aimed at theory building. This study began with the objective of conducting an in-depth look at one organization's experience with electronic commerce on the Internet, and answering general questions about project success and the use and impact of technology. The results of this single site study, therefore, will be a set of working propositions that may be carried forward and tested in relation to electronic commerce activity in other organizations. In the absence of comparable studies and theory, the findings in this chapter are offered as support for a new model of technology and strategy and a view of electronic commerce experiences in a large firm. Quantitative and qualitative data leading to the conclusions presented and limitations of the study are also discussed.

The findings summarized here are the result of multiple methods that suggested the best support for answers to the research questions. The methods included a pre-interview questionnaire to measure perceptions of the project team and department manager about constructs of interest. Structured interviews were then conducted with the project team, department manager, and marketing vice president to gather historical data on the project and its context within the firm's IS and business strategy, and to explore the impact of the
technology employed. A web-based survey of the firm's customers measured satisfaction, gathered demographics, and gauged customer attitudes about electronic commerce transactions. Results of the chains of evidence for each research question are presented along with researcher conclusions and working propositions.

Electronic Commerce Project Environment

The case study firm is a $3.4 billion regional airline company employing a low-cost provider business strategy. The firm specializes in a low-fare, single class of service, and primarily serves a short-haul market niche. The electronic commerce project was conceived, designed, and developed by the firm's Marketing Automation staff, whose sole purpose is to provide alternative distribution solutions to complement traditional ticketing methods. The firm is organized in a simple hierarchy with few layers of management (see figure 31).

![Diagram of Regional Airline Company (RAC) Organization Chart]

Figure 31. RAC Organization Chart
The firm's initial project to explore the Internet as a distribution medium began as a joint effort between Marketing and Systems staff. Joint projects across departmental lines, particularly between Systems (IS) and Marketing Automation are not unusual. When electronic ticketing options became feasible for the second phase of the project, the IS team members became a permanent part of the Marketing Automation Internet team. The five member team had worked on other joint effort projects in the past and were split between technical and marketing-oriented perspectives. One year after the launch of ticketless transactions, two original members plus their manager still remain involved in the electronic commerce process. Their company and industry experience range from five to seven years. These members, plus a newly hired web developer and the marketing vice president were interviewed for this study.

Response to Research Questions

Answers and conclusions resulting from data collection for each of the research questions are addressed in this section. The question and chain of evidence are reviewed, the relevant supporting evidence is presented, and a set of working propositions are offered as the basis for future research.

Relationship Between Strategy and Internet Commerce Success

The first research question sought to determine if there was a relationship between the use of technology as measured by strategic fit, the firm's tendency to pursue and adopt innovative technologies, and the ultimate success of the Internet commerce project. A pre-interview questionnaire was used to gather team and manager perceptions of the firm's
business and IS strategic orientation, and measure how well technology is used by the firm to support strategy, the primary determinant of fit. Additionally, key characteristics exhibited by innovative organizations were measured using an abbreviated version of the Scale of Support for Innovation (Siegel 1978). Structured interviews with the manager and project team provided the firm's definition of success. The project was successful in the firm's view based upon customer usage, positive customer and press reaction, tangible transaction volume targets, and reduction in transaction costs. Typical comments from the manager and project team are included in table 14 and result in the components of project success for the case firm shown in figure 32.

Table 14. Defined Elements of Web Site Project Success

<table>
<thead>
<tr>
<th>Project Success Factors</th>
<th>Typical Success Comments</th>
</tr>
</thead>
</table>
| **Tangible Factors**    | (Mgr) "We actually had some goals for number of transactions that would flow through the site... and we're for the most part on track with our projections."
|                         | (Mgr) "Looking back, we had some initial projections out there, and those were thumbs in the wind, because who knew? No one knew"
|                         | (Mgr) "When you're leading the edge like that there's no one else you can call up and ask what can I expect, or you can't go to a book and see what you should expect"
|                         | (TM1) "Another measure I guess we do is number of visitors; we're just very, very pleased... we ourselves do not publish or disclose our figures, but we look at what other people disclose in the press and we're very pleased with how we measure up against them"
| **Intangible Factors**  | (Mgr) "Reaction from the press and customers, and so forth, and so we've... been very happy with the good compliments we're getting, through both of those channels"
|                         | (TM1) "Actually, we felt [successful] right off the bat, we got so much positive public relations media exposure and things like that."

The department manager's comments reveal the difficulty of setting tangible goals to measure success in an uncharted area. Both manager and marketing team member
mentioned the value of positive press and customer response in the success formula, and indicate an awareness of competitive activity for comparison purposes.

![Project Success Components](image)

**Figure 32. Project Success Components**

Having identified that the electronic commerce project from the firm's perspective has met goals and is successful, the next step was to examine the firm's strategic positioning and the characteristics that support the adoption and use of innovation. The pre-interview questionnaire data summarized in tables 9-11 in chapter 5 indicate a profile of the organization's strategic orientation and a look into several cultural characteristics. Findings are summarized in table 15 at the end of the discussion section.

As identified by the project team and manager, the firm's strategic orientation tends to include being very aggressive in its marketplace, pursuing cost savings strategies internally and externally through strong supplier relationships, and assuming a proactive approach in introducing new products and services. While demonstrating aggressive growth, the firm tends not to pursue risky projects, does not rely on detailed studies prior to action, and is perceived not to be long-term in its project orientation. A mid-range
score for innovativeness, the use of creativity and experimentation, supports the firm’s tendency to grow through repeating prior successes and using what the firm considers standard processes and procedures.

Results of the IS orientation measure, how information systems support business strategy, seem to indicate the IS organization fulfills a traditional role. IS provides services as needed for areas such as business analysis, yet can respond innovatively when called upon to support business directions. Once the strategic direction is set, IS solutions may include the introduction of new products and services supporting its positive rating for the proactiveness dimension.

IT strategy reflects how important technology is to the firm, as well as how the firm views technology adoption. Respondents are in agreement about the firm having well defined business and technology strategies. The need to invest heavily in IT for the industry, its overall criticality to the firm, and ongoing modification to technology were rated neutral, possibly reflecting the relative maturity of what might typically be considered an information intensive industry. Responses were mixed on the firm’s tendency to pursue an early adopter position, and to adopt technology as a defensive strategy. The role of technology as a business driver was likewise rated neutral. Technology innovation and adoption, therefore, is not a given for this firm, nor do they typically consider themselves leading edge, as reflected in this comment about their web site’s popularity in the press.

TM1: We were very surprised how people picked it up and put it on the front page of their business sections, and, you know, talked about calling us a technology leader -- which in our history of 25, 26 years now, it's like,
we've been anything but (laugh)! It's one of our strengths that we're so independent that we're able to do things the way we want to do them, and hopefully, we'll be able to continue to do that because we really can control our costs by keeping our destiny in our hands.

As rated by project team and department manager, the firm very clearly demonstrates the characteristics typical of innovative organizations. The firm's leaders support creative solutions, the atmosphere is receptive to change, and diversity is encouraged. Ownership scores were high, but not at the top end, perhaps reflecting the firm's somewhat risk averse tendency in the strategic orientation scores.

Table 15. Evidence Summary for Strategy, Fit, Innovation and Success

<table>
<thead>
<tr>
<th>Construct</th>
<th>Measurement</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Success</td>
<td>Use, feedback, transaction goals</td>
<td>Firm judges site successful in relation to stated goals of customer use, positive feedback, and access and transaction goals</td>
</tr>
</tbody>
</table>
| Strategic Orientation      | Aggressiveness, defensive-ness, proactiveness - high  
Futurity, riskiness, analysis - low  
Innovativeness - medium | Aggressive pursuit of low-cost provider strategy, low risk growth, rapid decision process, repeats proven successful tactics |
| IS Strategic Orientation   | Aggressiveness - low  
Defensiveness, riskiness, proactiveness - medium  
Analysis, innovativeness - high | Fulfills traditional IS role of analysis and support, but responds innovatively to support business directions when required |
| IT Strategy                | Technology in support of business plan, IT evolution over time - high  
Positioning, investment, role as driver - medium  
Adoption status - low | Strategy is well defined, but technology is not viewed as a business driver, and is less well perceived as used in an early adopter role |
| Innovation Characteristics | Leadership, development, consistency, diversity, ownership - high | Firm demonstrates characteristics of innovative organizations |

(Note: high represents Likert response ratings of 4-5, medium of 3, low of 2)

Team projects and activities are clearly favored over individual contributions. The presence of innovation adoption characteristics would support earlier perceptions that the
company, while conservative in the use of technology, is fully capable of rising to the occasion when an appropriate use is identified and proves to be supportive of overall business strategy.

*Working Propositions For Research Question 1*

Support for research question 1, therefore, leads to the conclusion that this firm exhibits a synergistic relationship between business strategy, strategic fit, innovation adoption, and electronic commerce success on the Internet. Project goals support the firm's strategic positioning, and the project is successful in that it is well-received by customers and has reduced distribution costs. A firm otherwise not considered aggressive in the use of IT for competitive advantage succeeded with an Internet strategy that supported and complemented its overall business strategy. In this study, the firm's low-cost competitive strategy was complemented by using an Internet strategy and state-of-the-art technology to further reduce transaction costs. Innovation adoption characteristics exist within the firm and contributed to project success. The firm's culture encouraged the exploration of new ideas and technologies as a means of solving business problems and supporting strategy. With the commitment of upper management, the Marketing Automation group was encouraged and supported in their exploration into Internet commerce.

Based upon the conclusions from research question 1 evidence, three working propositions are offered:

\[ P_1: \text{There is a relationship between business strategy, strategic fit, innovation characteristics, and electronic commerce success.} \]
P₂: An electronic commerce Internet strategy that supports and complements business strategy increases the probability of success.

P₃: While the definition of project success will vary by organization, key components of success include use, positive acceptance, and transaction cost goals.

Role of Technology in Electronic Commerce on the Internet

The second research question seeks to identify the role that technology plays in electronic commerce projects. The IS strategic orientation for this firm indicates a supportive role, not one of aggressive searching for new uses and applications of technology. The structured interview responses, however, suggest that the unknown issues of Internet use for electronic commerce caused a change in the way the firm normally responded to technology. Interview responses indicated that technology drove the project, and led the team to pursue the Internet as an alternative distribution mechanism.

Furthermore, the project was conceived by Marketing Automation, a group outside the traditional IS organization, whereas, technology strategy was typically driven by the IS organization. IS staff jointly participated in the initial project, but in a different working environment. As electronic commerce on the Internet has proven successful, there is some indication from the team that IS may disapprove of not having control. To this point, however, the marketing manager notes, "we're such a small part of the big picture here," that autonomy is still anticipated for some time. He describes the usual relationship between his group and IS as follows:
MGR1. IS strategy for the company is really driven right out of our IS department. Really, where our group focuses is on electronic distribution, and in this case as it relates to the Internet, but it could be any other network that exists, whether it be telephone or interactive cable, etc. So, that's really our sole mission and responsibility, distribution via technology versus any kind of global IS strategy or mission statement.

In response to a question regarding the way technology typically supports strategy within the firm, the department manager responded that it varied by specific situation:

MGR1. It kind of varies. Sometimes you stumble onto technology first, and then you realize the business implications of it and you build a business piece of it based on the technology. Other times, and that's kind of how we backed into the Internet—we knew we wanted to do something with electronic distribution, but we didn't necessarily know it was going to be the Internet. Then the Internet kind of emerged and we then went after it. Now that we're full-fledged in the middle of Internet deployment, sometimes now it's really more of the opposite; we're now looking for business opportunities and that's driving the decision. We've already got the technology set to do it, now technology's the given and we're going to do the business deployment.

Specifically for the electronic commerce project, he felt that technology did act as an integral component of the project drivers. At the inception of the first pilot project in late 1994, web technology was just evolving and the full potential for electronic commerce over the Internet was unknown.

MGR1. Really, I think, the project evolved around the technology. In other words, we didn't say, 'boy, how could we efficiently get 500 pages of information out to people daily. Oh, let's use the Internet.' It's really, here's the Internet, what can we do with it?

The team leader's more technical orientation was reflected in his response about the role of technology, and leads to the conclusion that for a new and unproven innovation, technology both drives and defines the direction of the innovation.
TL. I think our attitude is that we use technology as a tool, and basically, this project has a lot of technology in it because the ideas are essentially a better, lower cost distribution mechanism. ... We went looking for technology that seemed to be a good fit for what we wanted to do. So, that's how we wound up. UNIX was an obvious choice as far as the Internet went, since the Internet is run on UNIX. Object oriented technology was another pretty obvious fit. So, we selected those kinds of technologies that seemed appropriate to the task for what we were trying to do.

The VP of Marketing acknowledged a total lack of understanding of the technology of the Internet. For him, the medium was the intriguing element, that of an open market, uncontrolled platform, waiting for everyone to "come and get it and figure it out." He agreed philosophically with the idea of the Internet. He left it to his people to deal with the technology, while acknowledging and understanding it was all new territory.

Summarizing the evidence for research question 2 in table 16, the role of technology for this electronic commerce project appears to have taken a divergent role from that of the firm's traditional IS strategic positioning. The Internet appeared to match the firm's goal of low-cost distribution, and offered a unique alternative to more costly online services previously explored. Electronic commerce was viewed, according to the VP, as something that was coming down the road and the firm needed to devote some resources in a limited way. For RAC, he stated, electronic commerce over the Internet was a classic 'skunkworks' project, with management approval, if not full understanding.
Table 16. Role of Technology Evidence Summary

<table>
<thead>
<tr>
<th>Construct</th>
<th>Measurement</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS Strategic Orientation</td>
<td>Aggressiveness - low</td>
<td>IS fulfilled supportive role</td>
</tr>
<tr>
<td></td>
<td>Defensiveness, riskiness, proactiveness - medium</td>
<td>Technology used conservatively, alternative solutions to traditional problems</td>
</tr>
<tr>
<td></td>
<td>Analysis, innovativeness - high</td>
<td></td>
</tr>
<tr>
<td>Role of technology</td>
<td>Actual use, structured interview data</td>
<td>Internet unknown as distribution channel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Technology drove functionality, defined capabilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Early adopters had no role models, unclear expectations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Technology as a tool evolved with the medium</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marketing, not IS leadership</td>
</tr>
</tbody>
</table>

Working Propositions for Research Question 2

If we consider that the technology that enables electronic commerce on the Internet is both an innovation and the channel through which the diffusion can occur, it would appear that first mover firms view the role of technology differently than those firms following an initial wave of interest. Additionally, the nature of the innovation can cause a change in the way a firm traditionally uses technology. The origin of the project within the organization can also effect traditional practices and uses of technology.

The following working propositions about the role of technology in research question 2 logically follow from this chain of evidence:

\[ P_4: \] Technology drives innovation for firms pursuing a first mover position, but becomes an enabling tool as the technology stabilizes.

\[ P_5: \] Electronic commerce on the Internet offers opportunities for non-traditional roles and uses of technology within the firm.
Electronic Commerce Critical Success Factors

In addition to identifying the specific components of success for RAC's web site, the broader issue of critical success factors (CSFs) for electronic commerce as a business process was the topic of interest in research question 3. Management and marketing viewpoints from the structured interview data were clearly distinguishable from those of the technical team members. From the manager and marketing viewpoint, the concept of added value for the customer is a reoccurring message, supporting the literature on the importance of electronic market characteristics such as reduced buyer search cost.

The team exhibited a customer-focused approach in all of its design and process issues. They were very aware of the importance of offering a comparable product regardless of distribution mechanism, and that customer trust and acceptance depended upon perceived equity and value. For example, the manager made this comment on the importance of value add and a comparable product:

MGR1. I think that the actual process itself has to be user friendly, customer friendly, fast, and of value, some sort of added value to them, the customer. And, that being either more convenient, better pricing, some other added benefit. But, primarily, I think it has to be as good as, as convenient as, and as quick as their current method of purchasing. Otherwise, it won't work, unless you have an awful big carrot on the other side.

The marketing vice president stressed the importance of presenting simple screens and transactions requiring no "thinking and worrying" to compete with the simplicity of a phone call. "We want the web to be a pseudo-agent," he stated.

While the technical members of the team understood the customer aspect of the project, they were also concerned about the undercover technical issues of communicating
with a legacy system, insuring topnotch security, and presentation formats that would work in a multitude of browser environments. Technical experience with similar projects actively contributed to project success. Under their mission of developing alternative distribution mechanisms, the team has a thorough understanding of the business, and their core competence is centered around the processes of reservations and ticketing. For the Internet electronic commerce project, only the technology and presentation medium changed. Operationally, interface and interaction decisions had to consider the medium and the anticipated user group. The front end product presented to the customer had to be both technically sound and intuitive, fully realizing "your users will never have a manual" (RAC Team Leader interview).

Table 17 summarizes the customer and technical success factors that this firm considers critical for their electronic commerce project. By summarizing responses to this question for all interviews within the analysis software, a synopsis of typical comments was prepared. Once summarized, comments were categorized by primary content factor. Further analysis of these comment categories yield the summary of CSFs shown in table 18, along with their definitions as supported by the interview text and prior research in the area of electronic markets. The results fall into those CSFs common to electronic commerce, in general, and those that are more specifically project related.
Table 17. Matrix of Critical Success Factor Supporting Comments

<table>
<thead>
<tr>
<th>Success Factors</th>
<th>Typical Supporting Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Customer Perspective</strong></td>
<td></td>
</tr>
<tr>
<td>Added Value</td>
<td>(Mgr.) &quot;more convenient, better pricing, some other added benefit&quot; (Mgr.) &quot;has to be as good as, as convenient as, and as quick as their current method of purchasing&quot;</td>
</tr>
<tr>
<td>Acceptance</td>
<td>(TM1) &quot;acceptance by your end user, the consumer, that they're comfortable with the security measures&quot;</td>
</tr>
<tr>
<td>Product Equity</td>
<td>(TM1) &quot;if they were to pick up the phone or get on the Internet, they'd get the same thing--they're going to see the same price and product&quot; (TM1) &quot;it needs to be as quick and as easy as a phone call ... where we'd like to be some day, whether you get on the computer or pick up the phone, it's going to be the same&quot;</td>
</tr>
<tr>
<td>Suitable Process</td>
<td>(Mgr.) &quot;the actual process itself has to be user friendly, customer friendly, fast, and of value&quot; (TM1) &quot;the 'Dad Test' - can my dad sit down and figure this out?&quot; (VP) &quot;Simplify, simplify, simplify&quot;</td>
</tr>
<tr>
<td><strong>Technical Perspective</strong></td>
<td></td>
</tr>
<tr>
<td>Commitment</td>
<td>(TL) &quot;have to have a commitment from your management that they're going to do this -- an informed commitment&quot; (TL) &quot;be cognizant of the fact, particularly if you're going to be the first guys out there, there's going to be some bumps in the road, and they have the willingness to support that in the beginning&quot;</td>
</tr>
<tr>
<td>Team Composition</td>
<td>(TL) &quot;the cohesiveness of our team was a huge factor; and I think that the various personalities and backgrounds that each of the folks brought to the table was an important consideration&quot; (VP) &quot;wonderfully bright people working on it&quot;</td>
</tr>
<tr>
<td>Project Management</td>
<td>(TM2) &quot;the Internet is just another medium ... software development projects require management of highly technical tasks, keeping track of where you are, as you do with all projects&quot;</td>
</tr>
<tr>
<td>Prior Experience</td>
<td>(TL) &quot;a lot of this stuff is not new to us; certainly, we have dealt with our reservation system in the past, and we have had several other products out there that have been done, or have allowed ticketing, or making reservations, in some form or fashion ... we knew more or less what we were up against, or what was required.&quot;</td>
</tr>
<tr>
<td>Performance</td>
<td>(TM2) &quot;it needs to be fast, ... having a server that will support a lot of access. They need to have a large pipe to their site&quot;</td>
</tr>
<tr>
<td>Security</td>
<td>(TM2) &quot;if they're actually going to do the commerce part of it, they need to have secure transactions ... and we all need to push the fact that a secure transmission is ok in the public side&quot;</td>
</tr>
<tr>
<td>Technology</td>
<td>(TM2) &quot;be willing to change with technology, since the Internet is a fluid medium, and the public expects you to pick up on that ... it's incumbent upon the company to stay up with technology and change with it&quot; (TM2) &quot;you have to support the full spectrum ... we still have text only browsers that hit our site&quot; (TL) &quot;this medium requires technical sophistication&quot;</td>
</tr>
<tr>
<td>Training</td>
<td>(TM2) &quot;you need to support the training of the technology, your technology experts in new aspects, whether that means commercial training, purchasing a book so they can read about it, affording them time to read and play with it, and understand new technology&quot;</td>
</tr>
</tbody>
</table>
General success factors include characteristics of electronic markets that make the Internet attractive as a market mechanism, i.e., transaction cost benefits for sellers and search cost benefits for buyers. Without these key economic drivers, it is doubtful that electronic commerce would be growing at the rate it is today. Even those organizations pursuing one of Wigand's (1997) other defined electronic commerce strategies, (marketing, diffusion, information retrieval, strategic networking) are able to do so because of the cost advantages of the Internet as a market medium.

Table 18. Electronic Commerce Critical Success Factor Summary

<table>
<thead>
<tr>
<th>Critical Success Factors</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EC Success Factors</strong></td>
<td></td>
</tr>
<tr>
<td>Value Add</td>
<td>Perceived benefit from changing search method for both provider and customer</td>
</tr>
<tr>
<td>Product Equity/Trust</td>
<td>Comparable price and process to current search method; customer confidence in provider, suitable process to support acceptance and use</td>
</tr>
<tr>
<td>Provider Transaction Cost Advantage</td>
<td>Economic benefit accrued to provider when changing or adding new market mechanism</td>
</tr>
<tr>
<td>Customer Search Cost Advantage</td>
<td>Economic benefit accrued to customer when changing market search mechanism</td>
</tr>
<tr>
<td>Innovative Characteristics</td>
<td>Provider tendency to pursue new mechanisms or technologies to support business strategy</td>
</tr>
<tr>
<td><strong>EC Project Success Factors</strong></td>
<td></td>
</tr>
<tr>
<td>Management Commitment</td>
<td>Informed support for new market mechanisms and sufficient understanding of the risk of new technology, training to support team requirements</td>
</tr>
<tr>
<td>Team Composition</td>
<td>Cross-functional skill sets, cohesiveness, autonomy</td>
</tr>
<tr>
<td>Core Competence</td>
<td>Prior experience and expertise in chosen area of EC endeavor</td>
</tr>
<tr>
<td>Project Management</td>
<td>Experience with managing highly technical tasks within the specified parameters of project resources and timing</td>
</tr>
<tr>
<td>Site Performance</td>
<td>Demonstrated technical achievement, acceptable response, transaction security, and support for electronic commerce</td>
</tr>
</tbody>
</table>

A relevant comment about the atypical nature of the team was extracted from the team leader interview text. Since the Internet represents such a cross-functional medium, team composition for an electronic commerce project should include cross-functional
skillsets and perspectives to achieve success. Content, process, and technical aspects of the web site will all impact customer acceptance.

TL: I think for us, the cohesiveness of our team was a huge factor; and I think that the various personalities and backgrounds that each of the folks brought to the table was an important consideration. I think that if you just throw half a dozen C++ programmers, or if you throw a half dozen marketing types in a room together, you're going to be unhappy, because this medium requires technical sophistication, and also a customer, people focus that usually doesn't come with technical sophistication! So, you've got to mix those two things together, and from at least my experience that has not been a typical kind of team.

Working Propositions for Research Question 3

Several propositions can be derived from the case firm's experience and perspectives on electronic commerce. CSFs appear to differ from general IS project success factors in several aspects. These factors include the cross-functional team dimension, the importance of flexibility in the use of evolving technology, the nature of the customer trust relationship, and an increased emphasis on security and performance required for this medium. Performance is particularly challenging, given the number of components along the telecommunications channel that are uncontrollable by the web site provider. Four working propositions flow from the evidence for research question 3:

P6: Critical success factors for an electronic commerce project on the Internet include managerial, marketing, and technical aspects.

P7: Managerial and marketing CSFs for electronic commerce projects on the Internet include: management commitment, value add, user acceptance, product equity, trust, and an intuitive process.

P8: Technical CSFs for electronic commerce projects on the Internet include: project management, flexible technology, core competence, performance, and security.
Team composition in terms of cross-functional skill sets is a major CSF for electronic commerce projects on the Internet.

Business Process Impact of Electronic Commerce

Bloch et al. (1996) suggest that the Internet adds value to businesses through improving business methods, transforming processes, and redefining business models and product capabilities. Research question 4 investigated how business processes were impacted for the case firm by expansion of the firm's business processes out into electronic markets on the Internet. The chain of evidence flows from the structured interview sessions. Both manager and technical perspectives summarized in table 19 support the goal of minimizing change to business processes and seamlessly integrating data from electronic transactions with the far higher volume of transactions flowing through traditional systems.

Table 19. Business Process Change Using Internet Technology

<table>
<thead>
<tr>
<th>Perspective</th>
<th>Representative Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manager</td>
<td>(Mgr.) “The business processes are in large part unaltered by the Internet, with the exception that you just don’t have that front end person inputting the data into the system. And other than that, once you get past that it flows all entirely the same way.”</td>
</tr>
</tbody>
</table>
| Team Leader       | (TL) “We particularly went out of our way not to impact other business processes that are somehow down the food chain. We were able to say, we will create reservations in the reservation system that are in the same exact format as what’s done by one of our more traditional distribution channels, and therefore, ... if your data flows from the reservation system, then you're fine. It's all going to be there, it's all going to be the same.”
|                   | “Fortunately for us, most everything that happens, for instance from an accounting viewpoint, is driven from the other side of the res [reservation] system.” |
For the case firm, and perhaps, for any large organization, Internet commerce adds value as one of several business transaction methodologies, and therefore, changes to business processes are not necessarily desirable. The ability to separate the front-end transaction from downstream accounting and inventory activities is one of many attractive features of Internet's client/server technology. The firm can choose at what point and how much customer interaction is desirable, therefore setting their own target for transaction cost reduction investigated in research question 5.

In addition to the potential for changing business processes, electronic markets are predicted to cause major changes in industry value chains through what is known as disintermediation, or the actual elimination of a step in the chain. In the airline industry, for example, there has been some speculation about the future role of the travel agent in the reservation process, and that perhaps that step will be bypassed via electronic market mechanisms. The marketing team member, however, reinforces RAC's use of the Internet as an alternative means of conducting business and does not see true disintermediation occurring.

TM1: Ah, we feel like it [the role of agent] never will; we feel like as our business grows and expands, rather than have to build another reservations center or hire another thousand agents, we'd rather have another alternative means so that we can maintain our costs. A very big part of RAC Airlines is we look at things from a cost side, rather than revenue side so much.

Working Propositions for Research Question 4

The conclusion from this discussion is that while Internet commerce has the potential for influencing and changing business processes, the extent of the change is a function of the firm's goals and intended use of the medium. When electronic commerce is
to be an additional, or alternative means of doing business, minimal change to business processes means less disruption to the normal flows into and out of the firm's data model.

Working propositions based upon these observations include:

\[ P_{10}: \text{Electronic commerce on the Internet offers the potential to significantly change business processes, but the extent of the change is impacted by the Internet strategy of the firm.} \]

\[ P_{11}: \text{Electronic commerce is a viable alternative market mechanism to complement standard business practices.} \]

Transaction Cost Advantage of Electronic Commerce

Malone (1987) and Wigand (1997) have both explored the transaction cost aspect of electronic markets. Transaction cost theory tells us that firms seek to minimize their transaction costs, or more specifically, the coordination cost aspect of price. Research question 5 explored the potential for transaction cost advantage of electronic commerce over traditional processes. Support for this question flows from the structured interviews with supporting industry information.

From the firm's Marketing Automation department viewpoint, the thrust of any electronic project is to find an alternative distribution mechanism that will reduce cost, a primary organizational driver. Although the firm would not share empirical evidence, they contend that the transaction cost advantage of Internet commerce outweighs the added technical cost of developing and supporting the electronic commerce web site. According to the department manager:

MGR1. Obviously, there's an increase in technology expense; there's hopefully a larger reduction in traditional expenses, which range from all sorts of things, from labor to bricks and mortar, to telephone and
communications to just everything. And, our experience has been that the reduction is far greater than the increase.

The significance of transaction cost becomes more apparent with the examination of airline industry statistics on the internal costs of ticket processing. Industry consultants estimate the direct costs of issuing a traditional paper ticket to be approximately $7 (Freiberg and Freiberg 1996). Some simple arithmetic shows it is not surprising that ticketless travel is now being promoted by all major airlines. Introduced by RAC in January 1996, ticketless reservations were available through the web in May of that year. The forty million reservations processed annually by RAC represent a savings potential of up to $100 million if converted to the ticketless process (Freiberg and Freiberg 1996). The concept of ticketless travel came first, but the web site was seen as an important mechanism to further expedite its availability and acceptance.

In addition to eliminating the paper ticket, the next most obvious cost reduction in offering electronic commerce over the Internet is that of directing volume away from call centers to a self-serve environment. For the population of RAC customers who are comfortable booking their own transactions or even just looking up information on flights and fares, eventual savings occur in labor cost avoidance of paying overtime or hiring additional staff. With a large enough shift, higher savings in the form of a reduced work force are possible. This is particularly true if the web site eventually handles some of the more complex transactions users are asking for such as applying flight credits or booking multiple stop travel itineraries. As a distribution medium, the Internet offers a low-cost per transaction mode of delivering information, as well as processing ticketless
transactions and reducing direct costs. Long term, electronic distribution will represent
greater levels of cost avoidance and reduction, as well as providing a transaction cost
advantage.

As the VP of Marketing pointed out, the web has a potential revenue side for
airlines also, in their ability to move so-called 'distressed inventory'. The seats that will go
empty when the plane leaves the gate are an income opportunity when presented to web-
based bargain hunters. Current measurables for RAC, however, are all on the cost side.
Upper management's goal is to slow down the annual increase in capital investment and
avoid building the next reservation center as business grows.

Working Proposition for Research Question 5

With additional savings possible through reduced agent contact, potential cost
avoidance in not hiring additional workers to support growth and volume swings, and a
totally paperless transaction, the cost benefits of Internet commerce for an airline are clear.
Any piece of that savings realized through web site activity contributes to its success, and
supports the benefits of the transaction cost advantage of electronic commerce. The
resulting working proposition supports the electronic commerce literature:

P12: Electronic commerce over the Internet offers a transaction cost
advantage over traditional processes through the potential for process
improvement and direct cost reduction, as well as through low-cost
distribution capabilities.

Customer Awareness in Electronic Commerce

A major challenge for any firm engaging in electronic commerce is getting the
message across to the targeted customer base. Established relationships among business
buyers and sellers make creating awareness slightly easier, but do not necessarily
guarantee participation. A consumer audience, even those loyal to the firm through a
continuing history of quality service, must first be made aware of the new distribution
option and then persuaded to try it.

Research Question 6 explored how the firm's customers became aware of the web
site. The chain of evidence, therefore, comes from the self-selected survey sample of
2,751 respondents to the web-based customer survey. While declining to report site
volume, the firm indicated the survey response rate of 100 per day represented
approximately a .5% return. Although statistical significance cannot be claimed at that
response level, the response quantity does reveal useful information about the customer
population.

Survey respondents for the awareness question (n = 2,438) were asked to indicate
the source or sources from which they first learned of the RAC web site. For this
population, print media of various kinds appeared to offer a viable mode of creating
awareness (47.1%). When combining the categories of friend, employee, and word of
mouth, approximately 15% of respondents acknowledge learning of the site from another
individual. A larger number (26.5%) first found the site through various search efforts. As
several respondents noted, they "just knew it had to be there" (RAC web survey). The
'other' category included direct mailings with frequent flyer program information, a variety
of magazines, links from other web sites, and other communication media such as on-hold
messages, radio, or billboards. The VP noted an upswing in web site activity occurred
after several recent major news stories on airline electronic distribution in the Wall Street
Journal and USA Today. News coverage gets people to try the site, and "we believe that if you can get trial on our side, they'll come back, because we believe we are equal to or better than anybody else's site in terms of customer ease of use." This is part of a growing interest in the Internet and electronic commerce, he feels, and displays "an ever-increasing momentum in society to go this direction."

The use of incentives to encourage use or change buyer behavior is one method of increasing awareness and trial rapidly. RAC began offering double flight credits to their frequent flyer program members at the beginning of May 1997, several weeks before the survey was launched. The desired consequence of this program was increasing the volume of users, and at times, site congestion indicated the successful achievement of the increase. Performance problems were reflected in user satisfaction ratings toward the end of the survey period and sent the technical team members looking for efficiency improvements.

Working Proposition for Research Question 6

RAC's marketing group has tried a variety of advertising means to create customer awareness. The more expensive advertising medium of television had one of the lowest response ratings (6.8%), while print medium of various types ranked high. The low television rating may reflect the specific demographics of the respondent group which included higher education levels and a large proportion of managerial and professional career levels, or simply a lower investment in this medium. Based upon the survey results, the working proposition for research question 6 suggests:

$P_{13}$: Firms engaging in electronic commerce on the Internet will increase awareness of their site through the use of multiple methods, including print
media and direct mailings, and should not underestimate the power of word of mouth or customer expectations.

Customer Satisfaction and Roles in the Electronic Commerce Process

An important aspect of electronic commerce success is obviously the level of satisfaction customers have with the process and their role in the transaction. Of particular interest is the user's desire for control of the process versus the loss of intermediaries, in this case, the personal touch of the reservation agent. Research question 7 pursues this line of inquiry, using the survey responses to the satisfaction section and a qualitative content analysis on customer comments.

A customer's overall experience with a product or organization strongly effects their satisfaction at a given point in time. Customers who have completed transactions on the RAC site generally assigned positive ratings to key satisfaction factors. The listed factors were drawn from a validated information system user satisfaction instrument (Doll and Torkzadeh 1988). When their overall experience was favorable, customers were more apt to be forgiving of occasional service problems, as revealed in user comments.

For the following satisfaction factors, an average of 1,532 responses were recorded. This response represents survey respondents who had completed a transaction on the web site (55.7% of total respondents). Site users typically complete reservations for themselves (70.3%), or for themselves and a traveling partner (21.4%). Personal travel was reported only slightly more often than business travel. Approximately 21% of respondents reported completing a ticketing transaction during the same visit in which they completed the survey.
Customers were asked to rate their satisfaction with various aspects of the electronic commerce transaction process using a scale of 1 to 5, with a rating of 5 representing very satisfied and 1 being not satisfied (see summary in table 20). Web site users tend to be satisfied with the timeliness and usefulness of site content in terms of supporting their need to check flights and rates before booking the ticketless transaction. Users felt they understood the mechanics of the transaction process and were satisfied with the ease of use, perhaps reflecting the generally high level of user experience.

Comments and suggestions to improve the process were abundant in the comment section, and tended to include comparisons with other airline web sites and resultant expectations.

Table 20. Customer Satisfaction Factors

<table>
<thead>
<tr>
<th>Satisfaction Factor</th>
<th>n</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>% above neutral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timeliness</td>
<td>1,532</td>
<td>880</td>
<td>323</td>
<td>124</td>
<td>45</td>
<td>161</td>
<td>78.5</td>
</tr>
<tr>
<td>Ease of Use</td>
<td>1,547</td>
<td>791</td>
<td>379</td>
<td>160</td>
<td>78</td>
<td>45</td>
<td>75.6</td>
</tr>
<tr>
<td>Usefulness</td>
<td>1,537</td>
<td>855</td>
<td>389</td>
<td>142</td>
<td>39</td>
<td>70</td>
<td>80.9</td>
</tr>
<tr>
<td>Security</td>
<td>1,279</td>
<td>715</td>
<td>304</td>
<td>179</td>
<td>31</td>
<td>50</td>
<td>79.7</td>
</tr>
<tr>
<td>Understanding</td>
<td>1,651</td>
<td>988</td>
<td>400</td>
<td>147</td>
<td>55</td>
<td>61</td>
<td>84.1</td>
</tr>
<tr>
<td>Output</td>
<td>1,619</td>
<td>858</td>
<td>417</td>
<td>188</td>
<td>52</td>
<td>104</td>
<td>78.8</td>
</tr>
<tr>
<td>Convenience</td>
<td>1,662</td>
<td>833</td>
<td>394</td>
<td>174</td>
<td>84</td>
<td>177</td>
<td>73.8</td>
</tr>
<tr>
<td>Personal Control</td>
<td>1,560</td>
<td>810</td>
<td>403</td>
<td>185</td>
<td>74</td>
<td>87</td>
<td>77.8</td>
</tr>
<tr>
<td>Speed</td>
<td>1,619</td>
<td>578</td>
<td>416</td>
<td>273</td>
<td>125</td>
<td>227</td>
<td>61.4</td>
</tr>
<tr>
<td>Confidence</td>
<td>1,624</td>
<td>752</td>
<td>437</td>
<td>175</td>
<td>86</td>
<td>174</td>
<td>73.2</td>
</tr>
</tbody>
</table>

Those customers who have booked a ticketless transaction do not appear to have the security concerns (6.3% dissatisfied) of those who have not yet adopted Internet commerce (33% of non-bookers). Transaction output from the electronic commerce process is provided in the form of a reservation summary that can be printed locally, with a follow-up faxed confirmation to acknowledge successful receipt. These options appear
to be satisfactory for the majority of site users, although the comments section included requests to receive an e-mail confirmation as provided by some competitive web sites. Personal control of the transaction process (77.8%) and accessing the web at their convenience (73.8%) received high satisfactory ratings from users, reflecting comments typical of those in table 21.

Table 21. Customer Control and Convenience Comments

<table>
<thead>
<tr>
<th>Factor</th>
<th>Representative Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>&quot;I love the control of doing it myself and not having to ask for the best rate...the risk of error of a not-to-alert rep! It has happened!&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;I felt I had control over the time it took to book my flight. I wasn't rushed into a decision.&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;I love it - not having to call &amp; speak to someone &amp; having control over which flight to take.&quot;</td>
</tr>
</tbody>
</table>
| Convenience  | "I usually book in the evening - between 8pm & midnight - Central time. Overall - very convenience and useful tool."
|              | "Very easy to access and get through your system -- I have had some difficulty with other airline web sites, but RAC is convenient and so easy to use." |
|              | "This web site is probably the most frequently and most widely used in our office. The convenience and the perks (double flight credit) that are included make it a logical place to book one's flights." |
|              | "This is a great convenience to be able to book flights from home or office at any time of day or night." |

Those customers who have completed ticketless transactions generally are satisfied with process speed, although a higher level of dissatisfaction (21.7% below neutral) for this factor was also recorded. Users generally felt confident the process would work and the system was reliable for their booking transaction activity.

An important related question is why people choose not to book an online reservation from the web site. Of the 48.8% (1,343) of survey respondents who do not complete booking transactions, 38.1% (512) reported they use the site for information only. One-third (447) of the respondents note their concern over entering a credit card
number as a reason for not booking. Not finding the desired flight or fare kept 35.9% from booking, and 12.6% either were not comfortable completing the transaction themselves or did not understand how to do so.

Reasons in the 'other' category included not having an appropriate browser version for secure transactions, corporate or government travel policies requiring use of designated offices or travel agencies, concern over receiving higher fares than available by phone (low level of trust), desire to apply flight credits, the need for complicated reservations such as multiple trip segments, or differing departure and return cities. The largest group of other comments included complaints about performance issues and failed transactions.

Negative satisfaction comments fell into several categories, with the largest group relating to performance issues (42.7%) as summarized in table 22. Users indicate the advantages of web transactions are quickly offset by slow access, server response or unclear error messages.

It appears from the survey comments that users do not fully understand the varying influences in the web response equation. Many expect better performance based on the processor class of their desktop computer. Those customers who have had generally positive experiences with the firm overall seem to be more forgiving with site performance problems than others.
Table 22. Dissatisfaction Relating to Performance

<table>
<thead>
<tr>
<th>Comment Tone</th>
<th>Typical Performance Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forgiving</td>
<td>&quot;Unavailable/slow access during the day during peak times. Otherwise, the site is the best way to book reservations.&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;I find the system to be quite slow, and have gotten lost in it a few times when it became stuck at the payment phase, but mostly I find it useful and I am VERY glad it is here.&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;Very useful for business travel, however the speed and the reliability of the connection is very questionable. As soon as the sight is able to handle the capacity it is currently seeing, booking through the web will be a much more useful alternative to booking via phone.&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;Oftentimes, it's very slow. Error message is very vague-I don't know why my schedule wasn't right, all I know is that it wasn't right! Pages often take a LONG time to load (I use a Pentium 133)&quot;</td>
</tr>
<tr>
<td>Not Forgiving</td>
<td>&quot;Every time I try to get on the webpage -- it always seems to be down. This is very frustrating!&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;Many times your flights and reservation systems are down, or extremely slow. I have given up on more than one occasion and have needed to call instead&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;I am totally disgusted with trying to use your system today. I've been trying for over 2 hrs &amp; your purchase link would not respond!&quot;</td>
</tr>
</tbody>
</table>

Working Propositions for Research Question 7

Once customers overcome personal concerns about transaction security and process, and build a sense of trust for product equity and the provider, they tend to be highly satisfied with the electronic commerce process. Similarly, they prefer the sense of control web commerce provides and do not perceive the loss of intermediaries as a negative. Performance problems through any phase of the telecommunications connection, however, tend to be viewed as web site owner problems and will immediately impact satisfaction. The following working propositions are offered in support of the evidence for research question 7:

P14: Customer satisfaction with electronic commerce transactions tends to run high for those who have adopted this medium, and users value convenience and control over the loss of intermediaries.
P₁₅: Customer satisfaction with electronic commerce is negatively impacted by performance problems anywhere along the communication channel.

Customer Expectations and Concerns over Electronic Commerce Transactions

Research question 8 gathered evidence on the concerns and expectations that customers have regarding electronic transactions and electronic commerce web sites. Evidence was drawn from both survey question results and a content analysis of free-entry comments.

RAC customers tend to outperform the average Internet user in terms of electronic purchasing. GVU survey results (Pitkow 1996) showed 20% of their respondents had made an Internet purchase in 1996, up from 11% in 1995. More than half (52.7%) of RAC customers totaling 1,449 respondents purchase other goods and services on the Internet. Computer software (42.7%), books and magazines (38.4%), and computer accessories (38%) accounted for the highest percentage of purchases, although financial services such as banking and brokerage were popular with 28.2% participation.

Survey respondents were asked to rate various factors as to how much each factor effected their ultimate decision to buy over the Internet (see table 23). Respondents ranked each factor by how important it was in their decision to purchase over the Internet, with a rating of 5 representing very important and 1 not important. Security, trust in vendors, and price appeared to be the major factors effecting a buy decision, followed closely by quality. Internet shoppers are less concerned with personal contact.
Survey respondents were primarily neutral (59.2%) on limited selection as a decision factor, contrary to other surveys (Todd & Jarvenpaa, 1997) showing selection as a primary reason for not buying. This may reflect a continually growing selection in available goods and services on the Internet. Going to see the product in a traditional shopping mode was less important to survey respondents (44.1%), but clearly shows a wide range of preferences.

Price influences the purchase decision for a majority of the respondents, with 64.6% giving it a high importance rating. Exceeding price as a factor was the amount of trust customers feel regarding the vendor, reflecting a purchase decision impact for 69.6% of respondents.

Security clearly came out as the most important factor in the buying decision, with 70.7% rating it over neutral as a high effect factor. Security also represented the highest number of responses (1,966) for those taking the survey, indicating a stronger interest in being heard on this topic. Talking to a person about the product or service tended to be a neutral or unimportant factor in the buying decision, with 80% rating it neutral or less.
Respondents indicated several interesting additional factors that influenced their booking decisions. Type-ins under the other factor category included well-designed web sites, site performance, access time and overall convenience, a prompt confirmation of the transaction, ease of doing returns, shipping charges, and prompt shipment. The type of product was mentioned as a factor in relation to standardization, that is, buying a brand name or standard product from even an unknown entity was preferable to an unknown brand and unknown provider. The time and convenience of Internet transactions versus phone or catalog was mentioned many times and highlights the importance of a perceived value add for Internet commerce transactions.

Perceived Value

Customer experiences with Internet shopping also impact their expectations for site content, performance, and the electronic commerce process. Survey comments were directly imported into NUDIST and categorized by content into positive (27%), negative (36%), and suggestions (37%) groupings. The suggestion category contained many comparisons to competitive airline sites and targeted process, content, and various other aspects that customers would like to see included or improved on the RAC web site.

Table 24 summarizes typical comments relative to competitive web sites, as well as representative customer opinions about incentives. Just as customers indicate incentives are important, the firm expects they will continue to provide them until such time as an electronic transaction can be better than a phone call. With a relatively simple fare structure, RAC's vice president notes that they can still build an incentive program and keep costs lower than building the next reservations center.
Table 24. Customer Expectations Relative to the Competition & Incentives

<table>
<thead>
<tr>
<th>Topic Area</th>
<th>Representative Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitive Sites</td>
<td>&quot;The site seems extremely slow. I tried for several hours to access flight schedules with a timeout every time. United's site was very responsive and access to flight schedules was very responsive.&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;Fix the server. The last four times I have tried to use this system it is down. Continental and American are never down.&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;Go check out Expedia by MS or some of your competitors sites to learn how to 'encourage' ticketless, online booking.&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;Overall, the web site is very good. You might consider adding frequent flyer account balance/transaction information. Many of the airline web sites now have that information available.&quot;</td>
</tr>
</tbody>
</table>
|                 | "Please put frequent flyer account information on-line so that customers can check their account balances whenever they want. Continental OnePass is already doing that."

Incentives

<table>
<thead>
<tr>
<th>Topic Area</th>
<th>Representative Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&quot;Will you continue to offer double credits to web users on a regular basis? This is probably just as important as the convenience factor.&quot;</td>
</tr>
<tr>
<td></td>
<td>System to me seems very slow. Please keep up with the Incentives with using the system. I know I wouldn't use this system if I wasn't receiving double credit.&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;The double segment incentive that I get from booking online is what keeps me booking online because it takes longer than calling reservations on the phone.&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;I like it because I get double flight credits. But, frankly, without this incentive, it is just as easy to have my travel agent do it. All other things being equal, convenience is the key when you are busy.&quot;</td>
</tr>
</tbody>
</table>
|                 | "The double flight rewards offer is a big incentive, and is the only reason I deal with the slow turnaround time on the internet. It takes about 15 to 20 minutes per reservation to complete which is too slow!"
|                 | "There needs to be a financial incentive involved such as the rapid rewards promo you've been doing because it's just plain easier to call and do it over the telephone." |
|                 | "At times the system is slow. I haven't diagnosed if it's your site, my ISP or an intermediate peering point in the Net. Absent the double Rapid Rewards credit, I wouldn't book online and would move back to my travel agent (it's faster and I like my agent)."

Particularly in light of performance problems on the site, customers were fairly clear in their desire for a supplemental value add. The high percentage of positive and suggestion-oriented comments (64%) indicate the overall high quality relationship RAC has with its customers. The intangible nature of customer goodwill appears to be an important consideration for user acceptance.
Working Propositions for Research Question 8

Consumer acceptance of electronic commerce transactions over the Internet is increasing, but many have very real concerns about the security and trust in the electronic transaction process. This comment from the survey succinctly summarizes many responses that followed a similar vein:

I know I would have no hesitation in booking flights via the Web knowing that the transaction would be 1.) secure, and 2.) hassle free - that I get to the gate ready for my flight and know that I will not be prevented from flying to my destination. This form of booking should be no less convenient and as uncompromised as booking a flight through my travel agent.

Firms participating in electronic commerce may find that in addition to doing all the right things with their web site from the technical side, and providing consumer education about access and security issues, they will need to offer incentives to persuade users to try and ultimately adopt this new medium. It is probable that the perceived value of electronic commerce must include several aspects of reduced buyer search costs before a paradigm shift in buying habits is likely. Evidence supports the following working propositions:

\[ P_{16} \]: Customers expect an added value beyond convenience when shifting purchasing behaviors to electronic commerce markets.

\[ P_{17} \]: Customer expectations for electronic commerce web sites are impacted by their experience with competitive web sites.

\[ P_{18} \]: Concerns over transaction security and vendor trust significantly impact consumer electronic commerce adoption and use.
Positioning of Electronic Commerce on the Internet as a Transaction Medium

An overall goal stated in the purpose section of this research was to examine electronic commerce experiences of a large firm to help clarify the correct positioning of Internet commerce. It was hoped the study would clarify whether Internet commerce represents incremental competitive advantage, an extension of traditional business processes, or a paradigm shift in the structure of electronic markets and the use of information technology.

Electronic commerce offered limited competitive advantage for first movers. The nature of the medium, however, allows for easy duplication and constant competitive surveillance, changing the mechanism into a competitive necessity. One aspect of electronic markets that seems to help sustain competitive advantage is that the organization's relationship with its customers can be enhanced. In this regard, a positive Internet commerce experience strengthens that relationship, but only when the firm is receptive to customer concerns and requests.

While there are clearly incentives for organizations of all sizes to invest and participate in Internet commerce, at this point it does not appear a market shift has occurred. Instead, a well-developed Internet strategy can be viewed as a powerful tactic in support of a firm's business strategy. The potential and future success of Internet commerce projects will be affected by how well organizations can sell the medium as an alternative means of conducting business. This includes addressing the complicated issue of transaction security from client to server over an open public network. Working
propositions supporting the positioning of electronic commerce as a transaction medium include:

P19: Depending upon the industry, electronic commerce may represent a competitive necessity rather than competitive advantage, but offers sustainable advantage in enhancing customer relationships.

P20: A paradigm shift must occur in consumer and business buying patterns before electronic market mechanisms will experience a significant complementary shift.

Table 25 summarizes the set of twenty working propositions developed from the case evidence.

Study Conclusions

The study has revealed a clear picture of the role of technology, business strategy, technical and managerial challenges, and critical success factors for an Internet commerce project judged successful by the case firm. Customer and business process impact were specifically reviewed, and minimizing their impact was a significant factor in measuring and judging success for this firm.

Critical success factors identified for the project were not unlike those for any IS project, with the exception of the importance of team composition for this cross-functional medium, and the increased requirements for transaction security and site performance over a primarily uncontrollable delivery mechanism. A synergistic link to business strategy was shown to be an important aspect for successful implementation of new technologies for the case firm.
Table 25. Matrix of Working Propositions Resulting from Case Evidence

<table>
<thead>
<tr>
<th>Proposition</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₁</td>
<td>There is a relationship between business strategy, strategic fit, innovation characteristics, and electronic commerce success.</td>
</tr>
<tr>
<td>P₂</td>
<td>An electronic commerce Internet strategy that supports and complements business strategy increases the probability of success.</td>
</tr>
<tr>
<td>P₃</td>
<td>While the definition of project success will vary by organization, key components of success include use, positive acceptance, and transaction cost goals.</td>
</tr>
<tr>
<td>P₄</td>
<td>Technology drives innovation for firms pursuing a first mover position, but becomes an enabling tool as the technology stabilizes.</td>
</tr>
<tr>
<td>P₅</td>
<td>Electronic commerce on the Internet offers opportunities for non-traditional roles and uses of technology within the firm.</td>
</tr>
<tr>
<td>P₆</td>
<td>Critical success factors for an electronic commerce project on the Internet include managerial, marketing, and technical aspects.</td>
</tr>
<tr>
<td>P₇</td>
<td>Managerial and marketing CSFs for electronic commerce projects on the Internet include: management commitment, value add, user acceptance, product equity, trust, and an intuitive process.</td>
</tr>
<tr>
<td>P₈</td>
<td>Technical CSFs for electronic commerce projects on the Internet include: project management, flexible technology, core competence, performance, and security.</td>
</tr>
<tr>
<td>P₉</td>
<td>Team composition in terms of cross-functional skill sets is a major CSF for electronic commerce projects on the Internet.</td>
</tr>
<tr>
<td>P₁₀</td>
<td>Electronic commerce on the Internet offers the potential to significantly change business processes, but the extent of the change is impacted by the Internet strategy of the firm.</td>
</tr>
<tr>
<td>P₁₁</td>
<td>Electronic commerce is a viable alternative market mechanism to complement standard business practices.</td>
</tr>
<tr>
<td>P₁₂</td>
<td>Electronic commerce over the Internet offers a transaction cost advantage over traditional processes through the potential for process improvement and direct cost reduction, as well as through low-cost distribution capabilities.</td>
</tr>
<tr>
<td>P₁₃</td>
<td>Firms engaging in electronic commerce on the Internet will increase awareness of their site through the use of multiple methods, including print media and direct mailings, and should not underestimate the power of word of mouth or customer expectations.</td>
</tr>
<tr>
<td>P₁₄</td>
<td>Customer satisfaction with electronic commerce transactions tends to run high for those who have adopted this medium, and users value convenience and control over the loss of intermediaries.</td>
</tr>
<tr>
<td>P₁₅</td>
<td>Customer satisfaction with electronic commerce is negatively impacted by performance problems anywhere along the communication channel.</td>
</tr>
<tr>
<td>P₁₆</td>
<td>Customers expect an added value beyond convenience when shifting purchasing behaviors to electronic commerce markets.</td>
</tr>
<tr>
<td>P₁₇</td>
<td>Customer expectations for electronic commerce web sites are impacted by their experience with competitive web sites.</td>
</tr>
<tr>
<td>P₁₈</td>
<td>Concerns over transaction security and vendor trust significantly impact consumer electronic commerce adoption and use.</td>
</tr>
<tr>
<td>P₁₉</td>
<td>Depending upon the industry, electronic commerce may represent a competitive necessity rather than competitive advantage, but offers sustainable advantage in enhancing customer relationships.</td>
</tr>
<tr>
<td>P₂₀</td>
<td>A paradigm shift must occur in consumer and business buying patterns before electronic market mechanisms will experience a significant complementary shift.</td>
</tr>
</tbody>
</table>
Relationship to Electronic Market Systems

Both similarities and differences between formal electronic markets (Bakos 1991) and Internet commerce are shown in this research. Bakos tells us that an electronic market system can reduce customer search costs of obtaining information from alternative suppliers. While customer loyalty and overall service experience were shown to be important to successful electronic commerce in this case, it is true that customers have increased power through lower search costs, and are aware of their choices in the market. They were not reluctant to express their expectations about web site content and process accordingly.

Supplier costs of communicating with customers are not only reduced under Internet markets, i.e., by shifting transactions from a call center representative to a self-serve environment, but information delivery is enabled or enhanced by the technology. Special flight rates, city pair promotions, and announcements of new routes are easily distributed to the Internet customer over a low cost mechanism replacing paper or other media.

Just as increased participation yields benefits to electronic market systems (Bakos 1991), increased activity in Internet markets offers benefits to both buyers and suppliers, along with additional competitive pressures. Customers will be more apt to embrace electronic transactions as the volume of available goods and services increase, and the perceived value of these sites outweigh that of traditional channels. Suppliers benefit from this growing customer base, while at the same time competitive pressures increase related to offering superior products, value add, site content, and performance.
Switching costs are not as significant under Internet commerce as they would be under a formal electronic market arrangement. They would certainly be minimal or non-existent for Internet buyers, unless incentive programs and perceived value can outweigh the ease of switching. Similarly, Internet commerce does not require the large capital investment of traditional EDI or formal IOS relationships, but as the case firm noted, the cost was well into six figures. Current computer press publications place the added costs of highly secure transaction web sites such as financial services at well into the millions of dollars (Hamilton 1997). Cost can vary dramatically for electronic commerce implementations depending upon the technical sophistication of the organization, project goals and objectives, and size of customer audience.

Revised Research Model

The initial model of technology and electronic markets presented in the research framework section changed somewhat based on study findings (see figure 33). It is clear the relationship between business strategy and strategic fit are important, but as revealed in this case, it is not necessarily the organization's historical use of technology that determines success with a new technology. With the proper atmosphere or culture encouraging innovation, an otherwise conservative user of IS can succeed with a new technology under a new market mechanism.

Strategic fit may be best demonstrated by observing a particular use of technology as it relates to the support of business strategy. The role of technology and its use to meet specific business needs, supports the appropriateness of the strategic fit construct for this organization. In this manner, an atypical firm may take an early adopter role, using a new
technology to support an innovative phenomenon such as electronic commerce on the Internet.

As shown in the model in figure 33, the process must start with the presence of a solid business strategy, supportive electronic commerce strategy, and appropriate use of technology to support both strategies. Strategic fit is the intersection of these three constructs. Critical success factor components exist both for electronic commerce in general, and electronic commerce projects, and are the things that have to exist or be done.
correctly for success. General factors include traditional constructs of value, search and transaction cost advantage, plus newly emphasized constructs of trust and innovative characteristics. Traditional project components of management commitment and project management are joined by the more complex demands of the Internet medium reflected in core competence, team composition, and site performance.

Customer acceptance represents a bar that most firms must still scale, but once accomplished, the Internet can be a productive and viable medium for an extension of traditional business boundaries.

Electronic Commerce and Competitive Advantage

RAC was the third airline worldwide to offer ticketless transactions to its customer via Internet commerce, and as such received an initial measure of early adopter advantage. As with many examples of new technology, competitive advantage cannot be sustained based on the technology alone. However, as noted by the VP of Marketing, electronic commerce supports their low-cost provider strategy. "In an industry where costs are king, lower costs and competitive advantage are one in the same."

In RAC's case, their strong relationship with their customer base provides support for Barney's (1995) view of complex resources and capabilities as a basis for sustainable advantage. The web site and electronic commerce capabilities strengthen the relationship for customers who have adopted this new search mechanism, while reducing transaction costs for the firm. While competitors can duplicate the technology of the Internet for electronic commerce, an organization's relationship with its customers can support early and lasting advantage.
Lessons Learned and the Future of Electronic Commerce and the Internet

Management at RAC see the Internet as filling a void in their ability to communicate with a growing customer base. It provides a cost-effective communications network to allow access to millions of people for distributing product, business promotions, and information. Such contact would be cost-prohibitive for any kind of private communications network. Electronic commerce on the Internet is here to stay, as far as they are concerned, because "there are enough folks like us who understand the business implications of it, and so 'us' as a commerce community have a vested interest in making it work."

RAC is very much aware of the need to provide increased functionality as well as convenience to earn customer acceptance. They feel they've been successful in developing an intuitive, user friendly web site that doesn't require an education in 'airlineese' to use. They are pleased with what they've accomplished, but recognize that additional functionality could be added to make it "easier, more convenient, more valuable." Survey results from users indicate positive acceptance of electronic commerce as a transaction medium, with adoption attitudes being strongly linked to a perceived value add above and beyond access convenience.

The most important project lesson that RAC offered to share is that to do electronic commerce in a serious way, a dedicated department or group of people is necessary. They do not see it as something that can be contracted out, or as a part of someone's job. "To us it's not a toy, it's not a fad, it's very serious business to us, and
that's reflected in our commitment to it in terms of head count and advertising, and budgets, and everything else....It's something we focus on daily."

From a more technical viewpoint, the team discovered the importance of separating functionality from the user interface because of the wide variation in browser software capabilities:

"We've been surprised and disappointed, I guess, in the ability or disability of some browsers; and the fact, and I guess that's another surprise, even when there is better software available, a large portion of the population out there doesn't know how to or is unwilling to upgrade....There are additional basic functional things we could do to what the site can do, and we'll look for ways to do that as much as we can in the existing minimal browser environment that we've chosen."

The future acceptance and long term success of Internet commerce seems to be closely associated with users' perception of Internet security. At the same time, participating firms have their own concerns about credit card fraud and potential for abusing airline inventories, such as speculative booking of seats. When asked about the potential for a new Internet architecture in the form of Internet II, RAC management agrees there could be major improvements in response time and net traffic, but hopes it does not come at the expense of transaction economics. Higher transaction costs and a net increase in cost to a business site could easily make the new superhighway a disincentive. On the topic of security, the department manager feels that current levels of RSA encryption and digital certificates, once consistently applied, could provide the two major elements for secure, non-reputable Internet commerce. The impact of the Internet has been positive for RAC and the airline industry, and as electronic commerce grows, they expect to be well positioned to leverage their early investment and learning curve.
Limitations of the Study

Case study research elicits some traditional concerns and exhibits inherent validity issues. By definition, case methodology offers the researcher low control of the environment, which in turn provides the real-world emphasis desirable for theory building. Lack of rigor of the methodology is often cited, as well as the possibility that a biased view of the data influences findings and conclusions (Buckley, Buckley and Chang 1976; Campbell and Stanley 1963; Yin 1994). Yin points out, however, that bias can also affect experiments, survey design, and even historical data research. It is up to the case investigator to report all evidence fairly. "Case studies, like experiments, are generalizable to theoretical propositions and not to populations or universes" (Yin 1994 p.10). This study used Yin's recommendations for developing and following a case study protocol, as well as a technical prototype for the automated survey, to increase process and data collection reliability.

One limitation of this research is that background evidence was gathered retrospectively to record historical events, especially early project planning and decision-making at the case firm. Having access to three of the original project participants reduced this concern, and through member checking an apparently accurate reconstruction of project background was feasible. Use of multiple methods, including the pre-interview questionnaire with previously validated instruments, was superior to a single method of gathering perceptions. The structured interviews further addressed the effects of time and place on data collection, and captured the evolution of project events.
The customer web survey was not a random population sample, but rather a self-selected response group. It was used with the assumption that a variable set of customers would access and complete the survey, and that those who did were representative of the overall customer population. Demographic statistics revealed a reasonably consistent profile of the firm's customer respondents to that of the typical Internet user set regarding age and gender, supporting the goal of obtaining a variable, yet somewhat representative response population. Education levels, however, were higher than average. The firm's management indicated this is their typical demographic set for customers in their frequent flyer program. While the response size by itself was a large quantity, as a percentage of overall users accessing the web site it cannot be considered statistically significant.

Results of the survey are offered not as generalizations, but rather instances and examples that may be compared to a larger or different customer segment.

The use of the Internet and World Wide Web as a collection mechanism for electronic surveys is increasing. As noted by Strauss (1996), however, the Internet presents challenges for traditional research methods. For example, it's very nature encourages anonymous responses and the user pool defies accurate description. The latter topic of user demographics is becoming less of a problem through well-run surveys such as the Georgia Tech GVU survey series (Pitkow 1994-1996). Through their series of six WWW surveys, sponsors Pitkow (1996) and associates have seen very clear trends in Internet user demographics, but without significant differences from survey to survey. Their own efforts in comparing their results to other published web surveys adds further
support to their contention that while self-selection bias existed, it was not serious (Strauss 1996).

Sample bias was less of a concern for this study, as the research targeted a specific group of customers of the case firm, those who accessed the firm's web site. As an additional measure to improve sample validity, the message header address of each survey response was reviewed. This procedure allowed the elimination of duplicate messages, as well as reviewed origination points for normality in terms of the frequency of corporate, university, and Internet Service Provider addresses.

**Future Research**

It will be the charter of a future research stream to test the model and working propositions presented here for cross-case and cross-industry correlation. With the growing interest in this area, no doubt similar work is already underway. It is clear at this point that electronic commerce shows great potential for extending or revising business processes and market boundaries, but only where it makes sense and supports business strategy.

The paradigm shift to electronic markets has not yet occurred, and may not in its entirety. Clearly, a shift must first occur in buyer behaviors, with an accompanying perceived value add or reduced search cost, while sellers seek their best balance with the transaction cost advantage electronic markets can offer. Only when an equitable balance with strong customer acceptance is reached, will a market shift logically occur.
APPENDIX A

CASE STUDY PROTOCOL
Case Study Protocol

Purpose & Organization of the Protocol
I. Procedures
   A. Initial Scheduling of Field Visit
      Review of Preliminary Information
      Project Plan Development
   B. Persons to be Interviewed and Other Sources of Information
      Management Overview
      Project Approval Parties
      Project Development Team
   C. Field Procedure Development
      Evidence Gathering Process
      Data Collection Techniques
      Data Handling and Software Tool Usage
   D. Technology Plan Development
   E. Web Survey Procedures
   F. Field Interview Procedures

II. Case Study Protocol and Questions
   A. Definition of the Internet Commerce Project
   B. Business Process Impact
   C. Customer Impact
   D. Structured Interview Development
   E. Web Survey Development
   F. Field Survey Development

III. Analysis Plan and Case Study Reports
   A. Individual Case Study
      Descriptive & Explanatory Information
   B. Customer Survey Results
   C. Firm Summary Report
      Web Survey Results / Interpretation and Suggestions
   D. Field Survey Analysis Feedback

IV. Analyze Data
   A. Structured Interview Taped Sessions
   B. Perform Content Analysis
   C. Complete Web Survey Analysis
Case Study Protocol – Field Working Document

Purpose:

The purpose of the study is to investigate the use of the Internet for electronic commerce transactions. Through various forms of evidence, the study will look for relationships among key constructs, determine Internet commerce project critical success factors, and view the use of this form of information technology in relation to competitive advantage and business strategy. This protocol documents the process and procedures for study replication at different case sites as the research is extended.

Organization of the Protocol

I. Planning Procedures

A. Initial Field Visit

   Review of Preliminary Information
   Project Plan

B. Interview Schedules and Other Sources of Information

   Firm Level Management
      Strategic
   IT
   Department Level Management
      Marketing Automation
   Project Development Team

C. Data Sources & Collection Procedures

Evidence Gathering Process - A pre-interview survey will be used to introduce the topical areas and give the interview subjects an opportunity to think about the topics, past events, and their role or perceptions regarding the topic. Interviews will build upon the survey responses as the basic subject lines, with additional research questions or
clarification as appropriate during the interview session. Evidence in the form of reports, usage volume, or other data as can be supplied will supplement interview data.

**Data Collection Techniques** - The pre-interview survey will form the foundation for further interview guidelines, with a structured interview process following. The interviews will be taped, pending approval of the firm and interview participants. In the event the interviewee prefers not to be taped, a data collection form will be used to transcribe comments in as much detail as possible.

Survey techniques at the field airport terminals will include the interview script, and a set of pre-numbered response forms. Appropriate sections will be completed by the interviewer for each survey participant. The initial goal will be 100 face-to-face contacts, spread over several days, times of day, and destination gates.

Web survey instrument returns will be handled per the data collection process included in the WebForms tool. Visitors to the firm web site will have the opportunity to complete the form on a totally volunteer, non-random basis. When accessing the survey form, the participant is linked to the unix web server at the University of North Texas to complete the form. Data resides as an e-mail message on the NT POP3 server until accessed by the researcher.

**D. Data Handling and Software Tool Usage**

**Interview Data Procedures** --- Interview session responses will be transcribed into Microsoft WORD 97 then imported into the NUDIST qualitative software analysis package. Each response is treated as a document, with key words indexed for sorting and analysis. Words repeated or used consistently across the organization will be identified for further exploration or pattern development per Rubin and Rubin, Chapter 4 as "emerging themes that have potential meaning to the organization". The indexing feature of the software allow a summarization of all contents by subject comment, and the potential for identifying significant organizational or topical factors.

**Web Survey Procedures** -- The survey resides on the UNT unix server at www.edu.unt. As each response is submitted, a cgi script returns the participant to the Southwest Airlines Home Page. Submission also sends the response form as an e-mail message to a mail account on an NT POP3 mail server. Accessing the mail server via the WebForms mail client allows direct import of the messages into the research system and parses field responses into the tool's database structure. Upon completion of this data gathering stage, the data will be exported to a Microsoft Access database for further manipulation and relevant analysis with SPSS.

**Field Survey Procedures** -- The interview scripts include qualifying questions and response paths for further questions, completion of a paper copy of the web survey, or
conclusion of the interview. Upon completion of the targeted number of participants, the responses will be entered into an Access database for later sorting and analysis. Initial thoughts include a web site marketing piece, minimally a business card sized promo with web address and information.

II. Field Protocol

A. Definition of the Internet Commerce Project

The research model for the study is the first step at identifying electronic commerce success factors and the possible relationships between them. Case study research uses this structure as a starting point, recognizing that other factors may appear during the interviewing and the data collection process. The initial target is to identify how the use of Information Technology applies to electronic markets, if it offers competitive advantage, how alignment with business strategy impacts success, and specifically how Internet commerce affects or changes prior theory.

B. Study Model

C. Research Questions

Initial questions that arise from reviewing the literature on electronic markets, as well as the current activity on the Internet include the following. These serve as a starting point, and data collection may change or increase question content and direction.

1. How are strategic technology fit, electronic commerce innovation and adoption tendency, and Internet commerce success related?

2. How are business processes impacted by electronic markets under the Internet?

3. Does Internet commerce provide a transaction cost advantage over traditional processes?

4. What are the critical success factors for successful implementation of electronic commerce Internet projects?

5. To what degree are the firm’s customers aware of its electronic commerce web site?

6. How satisfied are customers with electronic transactions and their role in the transaction process?

7. How do customers perceive the loss of intermediaries in electronic transactions?

8. What concerns do customers have regarding electronic transactions?
D. Topic Constructs/Data Factors

The following table includes the topic constructs that will identify key factors in the research model and address the research questions above, and the anticipated measurement method. The next step is to identify survey and interview subjects, or other sources of possible data.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Variables</th>
<th>Measures</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Fit</td>
<td>Management perception of IT and business strategy fit</td>
<td>Structured interviews</td>
<td>Firm -</td>
</tr>
<tr>
<td>Innovation/adoption tendency</td>
<td>Management perception of IT competitive advantage</td>
<td>Structured interviews</td>
<td>Firm -</td>
</tr>
<tr>
<td></td>
<td>Disintermediation within transaction chain</td>
<td>Pre and post web site business processes</td>
<td>Firm -</td>
</tr>
<tr>
<td></td>
<td>Electronic Transaction cost</td>
<td>Cost comparison</td>
<td></td>
</tr>
<tr>
<td>Characteristics of Electronic Markets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Success</td>
<td>Management and staff perceptions of success factors</td>
<td>Structured interviews</td>
<td>Departmental-</td>
</tr>
<tr>
<td></td>
<td>Project performance to goals</td>
<td>Site access &amp; activity statistics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Project lessons learned</td>
<td>Structured interviews with development team</td>
<td></td>
</tr>
<tr>
<td>Customer Awareness</td>
<td>Reported awareness of firm's electronic commerce web site</td>
<td>Field survey of airport customers</td>
<td>Customer -</td>
</tr>
<tr>
<td></td>
<td>Tendency to adopt technology</td>
<td></td>
<td>Best times, days, destination gates.</td>
</tr>
<tr>
<td>Customer Satisfaction</td>
<td>Reported satisfaction with firm transactions</td>
<td>Web survey of customers accessing web site</td>
<td>Customer -</td>
</tr>
<tr>
<td></td>
<td>Perceptions of electronic commerce</td>
<td></td>
<td>web link</td>
</tr>
<tr>
<td></td>
<td>Desire for personal control vs. Role of intermediaries</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Strategic Fit (Firm Level View) Management perception of IT and business strategy fit:

   b. IT strategic orientation: support for the elements above.
   c. Strategic Fit: synergy or coherence between the two.

   a. Business Strategic Orientation

   Developing and implementing effective business strategy is an ongoing challenge for most organizations. The following statements help us understand your organization’s strategic orientation relative to your marketplace. Please place an ‘x’ before the appropriate number that indicates how you rate the company in terms of the following elements of business strategy. A rating of ‘1’ means a very low or not important aspect of the firm’s strategy, and ‘5’ is a very high, or extremely important aspect in the firm’s business strategy.

   (AG)1. We are always searching for new business opportunities to support our desire for market share domination

   (AN)2. When confronted with business decisions we develop comprehensive analyses such as detailed, numerical reports and evaluations.

   (ID)3. We optimize coordination among functions, e.g. finance & marketing, and place heavy emphasis on cost cutting and effectiveness

   (ED)4. We exercise a high degree of bargaining power in our marketplace, forming close alliances with customers and suppliers.

   (F) 5. We carry out long-term research to gain a future competitive edge, and are considered to have a long-term orientation.

   (P) 6. We are usually the first to introduce new products or services in our markets.

   (R) 7. Our mode of operation is riskier than our competitors, and we have the tendency to take on risky projects

   (I) 8. We adopt new technologies if necessary to defend our market position and reward creativity and experimentation

   (1=very low, 5 = very high)
b. IS Strategic Orientation -- (Firm Level View) Support for business strategy

### IS Strategic Orientation

Using information technology to support business strategy is a major goal for most organizations today, and can be a major factor in achieving competitive advantage. Please rate the company in terms of how well your information systems support the following elements of business strategy; a rating of ‘1’ meaning not supported at all, and ‘5’ being very well supported.

(1=not at all, 5 = very well)

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(AG) 1</td>
<td>Information systems assist in the identification of new business opportunities.</td>
</tr>
<tr>
<td>(AN) 2</td>
<td>Information systems provide information on market position, providing detailed, numerical evaluation.</td>
</tr>
<tr>
<td>(ID) 3</td>
<td>Information systems adequately measure performance to goals emphasizing on cost cutting and effectiveness.</td>
</tr>
<tr>
<td>(ED) 4</td>
<td>Information systems allow electronic linkages with customers and suppliers and help to form tight marketplace alliances.</td>
</tr>
<tr>
<td>(F) 5</td>
<td>Information systems assist with long-term planning and provide scalable solutions to align with our long-term orientation.</td>
</tr>
<tr>
<td>(P) 6</td>
<td>Information systems help us introduce new products/services in our market and support our first mover tendency</td>
</tr>
<tr>
<td>(R) 7</td>
<td>Information systems help us take calculated business risks.</td>
</tr>
<tr>
<td>(I) 8</td>
<td>Information systems help us generate innovative solutions through creativity and experimentation</td>
</tr>
</tbody>
</table>
c. Overall IT Strategy – (Firm Level View) Management perception of IT competitive advantage; adapted from Chan 1992

**Overall IT Strategy**

The degree to which information systems are used within a company reflects the organization’s overall technology strategy and often follows industry requirements. IT strategy also impacts how new technology is adopted by the organization. Please indicate to what extent you agree or disagree with the following statements relating to the overall use of information technology in the firm, with ‘1’ meaning completely disagree, and ‘5’ meaning completely agree.

(1=Completely Disagree, 5 = Completely Agree)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Our information technology strategy is clearly defined.</td>
<td>_1 _2 _3 _4 _5</td>
</tr>
<tr>
<td>2. Information technology is critical to our business.</td>
<td>_1 _2 _3 _4 _5</td>
</tr>
<tr>
<td>3. In our industry, firms have to invest heavily in information technology if they wish to compete.</td>
<td>_1 _2 _3 _4 _5</td>
</tr>
<tr>
<td>4. We adopt entirely new technologies to defend market position.</td>
<td>_1 _2 _3 _4 _5</td>
</tr>
<tr>
<td>5. We classify ourselves as early adopters of innovations.</td>
<td>_1 _2 _3 _4 _5</td>
</tr>
<tr>
<td>6. We have made significant modifications to the technologies we employ in our business operations.</td>
<td>_1 _2 _3 _4 _5</td>
</tr>
<tr>
<td>7. Our managers frequently see potential business opportunities created by information technology developments.</td>
<td>_1 _2 _3 _4 _5</td>
</tr>
<tr>
<td>8. Our business strategy is clearly defined.</td>
<td>_1 _2 _3 _4 _5</td>
</tr>
</tbody>
</table>
2. Innovation/Adoption Tendency (Firm and Departmental Level View) Organizational characteristics supporting innovation: Leadership, Ownership, Norms for Diversity, Continuous Development, Consistency (Siegel Scale of Support for Innovation 1978).

**Innovation/Adoption Tendency**

In addition to being an important aspect of IT strategy, innovation and the tendency to adopt new technologies are strongly impacted by industry and corporate culture. Please indicate to what extent you agree or disagree with the following statements relating to the adoption of innovation within the firm, with ‘1’ meaning completely disagree, and ‘5’ meaning completely agree.

1. This organization is always moving toward the development of new answers.
2. This organization can be described as flexible and continually adapting to change.
3. Our ability to function creatively is respected by the leadership.
4. Around here people are allowed to try to solve the same problem in different ways.
5. Creativity is encouraged here.
6. People in this organization are always searching for fresh, new ways of looking at problems.
7. The way we do things seems to fit with what we’re trying to do.
8. Work in this organization is evaluated by results, not how they are accomplished.
9. The methods used by our organization seem well suited to its stated goals.
10. My goals and the goals of this organization are quite similar.
11. Members of this organization would rather be working here than anywhere else.
12. In this organization we tend to stick to tried and true ways.
13. New ideas can come from anywhere in this organization and be equally well received.
14. Members of this organization feel encouraged by their superiors to express their opinions and ideas.
15. I have the opportunity to test out my ideas here.
16. In this organization, the way things are taught is as important as what is taught.
17. This organization is open and responsive to change.
18. My ability to come up with original ideas and ways of doing things is respected by those at the top.
19. The role of the leader here is to encourage and support individual members' development.
20. The best way to get along in this organization is to think the way the rest of the group does.
21. Creative efforts are usually ignored here.
22. People here try new approaches to tasks, as well as tried and true ones.
APPENDIX B

TECHNOLOGY PROTOTYPE PLAN

AND CUSTOMER WEB SURVEY
Technology Prototype Plan

I. Identify Technical Resource Requirements

A. Web Mail Server Specifications
   Hardware Requirements
   Software Requirements
B. Form Tool Identification
C. Connectivity Specifications

II. Access Available Resource for Prototype Survey

A. Microsoft Windows NT Server with POP3 Mail Server
B. WebForms Survey Pilot Development
C. Data Receipt Database Structure and Export Process

III. Test Prototype

A. Launch Form Pilot Test
   Form Completion
   Form Receipt
B. Test Data Retrieval Process

IV. Launch Live Web Survey

V. Download and Store Responses
# Web Users Survey

Please help us serve you better by answering the following user survey. This survey should only take 5 minutes of your time. Your responses are completely anonymous, and no record is kept of this transaction. Thank you!

1. Please tell us how you use the RAC Home Gate web site. (check all that apply)
   - N/A
   - Fun Pack Vacations
   - Company News
   - Message from CEO
   - Fares Information
   - Photo Album
   - Financial/Company Information
   - Promotional Information
   - Flight Schedule
   - Reservations
   - Frequent Flyer Information
   - Route Map

2. How long have you been visiting the RAC web site?
   - N/A
   - Between 1 and 2 years
   - First Visit
   - More than 2 years
   - Less than 1 year

3. How did you hear about the RAC Home Gate? (check all that apply or choose 'other' and enter your response).
   - N/A
   - Newspaper
   - Airport
   - Print Ad
   - Flight Schedule
   - Television
   - Other source

4. Please tell us about your last experience in booking a reservation through the RAC web site. If you did not book a reservation, please go to Question 5.
   a. Did you book a reservation for:
      - yourself
      - personal travel
      - business travel
      - someone else
      - personal travel
      - business travel

   b. How satisfied (on a scale of 1 to 5) were you with the following aspects of the reservation transaction? (1 = not satisfied, 5 = very satisfied)

<table>
<thead>
<tr>
<th>Aspect</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timeliness of content</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Ease of use</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Usefulness of content</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Security of the transaction</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Your understanding of the system</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Format of output</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Convenience of access</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Personal control of transaction</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Speed of the process</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Confidence the system will work</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
5. If you have not completed a booking, what prevents you from booking your ticket via the web site? (Check all that apply or choose 'other' and enter your response in the text box).
   ○ N/A
   ○ Have completed booking
   ○ Desired flight not found
   ○ Desired fare not found
   ○ Did not understand how to book
   ○ Not comfortable booking myself
   ○ Credit card security concern
   ○ Use site just for information
   ○ Other __________________________

6. Do you have any comments or suggestions regarding the RAC web site or web transactions in general?
Comments: __________________________

7. Please tell us what other products or services that you purchase over the web. (check all that apply or choose 'other' and enter your response in the text box).
   ○ N/A
   ○ Apparel/Clothing
   ○ Arts/Crafts
   ○ Books/Magazines
   ○ Computer Accessories, Peripherals
   ○ Computer Software
   ○ Educational/Children's Items
   ○ Flowers/Gifts
   ○ Food/Condiments/Beverages
   ○ Health Products
   ○ Music (CDs, Tapes, Albums)
   ○ Novelty Items
   ○ On-line Info Services
   ○ Services (Banking, Brokers)
   ○ Tickets to Events
   ○ Travel/Leisure Products
   ○ Other __________________________

8. In terms of deciding to purchase products/services over the web, please tell us how much the following factors contribute to your purchase decision. (1 = very little, 5 = very much). Only one response may be chosen for each factor, or choose 'other' and enter your response in the text box.

   a. Limited Selection ___N/A ___1 ___2 ___3 ___4 ___5
   b. Concern over quality ___N/A ___1 ___2 ___3 ___4 ___5
   c. Would rather go shopping & see products ___N/A ___1 ___2 ___3 ___4 ___5
   d. Pricing ___N/A ___1 ___2 ___3 ___4 ___5
   e. Trusting the vendors ___N/A ___1 ___2 ___3 ___4 ___5
   f. Security Concerns ___N/A ___1 ___2 ___3 ___4 ___5
   g. Would rather talk to a person ___N/A ___1 ___2 ___3 ___4 ___5
   h. Other __________________________
   ___N/A ___1 ___2 ___3 ___4 ___5

9. How long have you been using the Internet (including World Wide Web, email, gopher, ftp, etc.)?
   ○ N/A
   ○ Less than 6 months
   ○ 6 to 12 months
   ○ 1 to 3 years
   ○ More than 3 years
10. From where do primarily access the web? (Please select 1 or choose 'other' and enter your response in the text box).

- N/A
- Home
- Office
- Distributed/Mobile work place
- Educational Institution
- Other ____________________

11. Which of the following categories best describes your primary occupation? (Please select 1 or choose 'other' and enter your response in the text box).

- N/A
- Computer Related
- Management
- Professional
- Service/Support
- Technical/Trades
- Educator/Student
- Retired
- Other ____________________

12. Please indicate the highest level of education completed. (Please select 1 or choose 'other' and enter your response in the text box).

- N/A
- High School
- Some College
- College Graduate - 4 yr
- Master's Degree
- Doctorate Degree
- Professional Degree (MD, JD, etc.)
- Vocational/Technical School (2 yr)
- Other ____________________

13. What is your gender?  

- Male  
- Female

14. Please indicate your age group.

- Under 21
- 21 to 34
- 35 to 44
- 45 to 54
- 55 to 64
- 65 or older

Thank you very much for your assistance. Please select the submit button to send your survey. You will be returned automatically to the RAC home page.

Submit Survey  
Reset Survey
APPENDIX C

PRE-INTERVIEW QUESTIONNAIRE
University of North Texas

Research Questionnaire

An Examination of Electronic Commerce and the Internet:
Role of Technology, Critical Success Factors,
and Business Strategy

Sharon W. Tabor, Ph.D. Candidate
Business Computer Information Systems Department
College of Business
University of North Texas
Denton, TX 76203

Phone: (817)485-7377
Fax: (940)565-4149
Project Introduction

The rapid expansion of electronic commerce on the Internet is making news in every form of communication media. Surveys indicate a broad interest in the Internet as an extension of traditional transaction channels and formal Interorganizational Systems (IOS) partnerships. Financial services, travel, segmented consumer products, and advertising industries are reporting initial success.

Closely following the growth of electronic commerce on the Internet is a need to analyze the relative success of the activity. This includes the business strategy employed in choosing to move to the Internet, determining how organizations define and measure success, and the ultimate impact of Internet commerce transactions on business processes, electronic markets, and economic activity within a firm and its industry.

Electronic commerce on the Internet has its own unique set of business issues and challenges including security, electronic payments, integration, government regulation, social impact, and technology innovation and adoption. This research effort will explore several of these issues as well as critical success factors and the link to business strategy. Additionally, it will explore several unique characteristics of Internet commerce such as transaction cost impact and the changing roles of intermediaries within a value chain.

Benefits to Your Organization

Your company’s participation in this research is very much appreciated and will contribute to the overall understanding of the Internet commerce phenomenon. Additionally, the customized field and web surveys will provide valuable marketing information regarding customer awareness of your Internet web site, customer satisfaction with the electronic transaction process, and overall customer acceptance of electronic commerce over the Internet as an alternative market medium.

Note to Participants

This brief survey series will gather preliminary information about the areas of strategic business orientation, information technology orientation, and innovation adoption tendency. An interview will follow at your convenience and should last less than one hour. Please note, your participation is totally voluntary, and you may withdraw from the research project or end the interview at any time. Questions relate solely to perceptions of how electronic commerce and the use of information technology relate to business strategy, and represent no personal risk.
All responses gathered in interviews or via surveys will be held in strict confidence. Only UNT researchers will see your personal responses. Any data used for reports or journal articles will be in the form of group summaries or content analysis without individual or company identification. No one other than UNT researchers will have access to your responses at any time. If you have questions about the project at any time, please feel free to contact the researcher named on the cover at 817/485-7377.

Thank you for your participation!

This project has been reviewed and approved by the UNT Committee for the Protection of Human Subjects – (940) 565-3940

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**Participant Information**

Participant information is gathered only to distinguish your responses from others completing the survey. No names will appear in the final analysis document.

Name: ___________________________  Years with Company: ___________________________

Position: ___________________________  Years in Industry: ___________________________

Functional Area:  
1. __ Marketing  
2. __ Marketing Automation  
3. __ Operations  
4. __ Reservations  
5. __ Strategic Planning  
6. __ Systems  
7. __ Other

May we contact you with follow-up questions or clarification:  
8. __ Yes  
9. __ No
## Business Strategic Orientation

Developing and implementing effective business strategy is an ongoing challenge for most organizations. The following statements help us understand your organization’s strategic orientation relative to your marketplace. Please place an ‘x’ before the number that indicates your rating of how important the following elements of business strategy are to the firm. A rating of ‘1’ means a very low or not important aspect of the firm’s strategy, and ‘5’ is a very high, or extremely important aspect in the firm’s business strategy. (1=very low, 5=very high)

1. We are always searching for new business opportunities to support our desire for market share domination
   
2. When confronted with business decisions we develop comprehensive analyses such as detailed, numerical reports and evaluations.
   
3. We optimize coordination among functions, e.g. finance & marketing, and place heavy emphasis on cost cutting and effectiveness
   
4. We exercise a high degree of bargaining power in our marketplace, forming close alliances with customers and suppliers.
   
5. We carry out long-term research to gain a future competitive edge, and are considered to have a long-term orientation.
   
6. We are usually the first to introduce new products or services in our markets.
   
7. Our mode of operation is riskier than our competitors, and we have the tendency to take on risky projects
   
8. We adopt new technologies if necessary to defend our market position and reward creativity and experimentation

<table>
<thead>
<tr>
<th>Statement</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
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<td>2</td>
<td>2</td>
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<td>3</td>
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<tr>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
</tr>
</tbody>
</table>
IS Strategic Orientation

Using information technology to support business strategy is a major goal for most organizations today, and can be a major factor in achieving competitive advantage. Please place an 'x' before the number that indicates your rating of how well your information systems support the following elements of business strategy; a rating of '1' meaning not supported at all, and '5' being very well supported.

(1=not at all, 5 = very well)

1. Information systems assist in the identification of new business opportunities.  

2. Information systems provide information on market position, providing detailed, numerical evaluation.  

3. Information systems adequately measure performance to goals emphasizing cost cutting and effectiveness.  

4. Information systems allow electronic linkages with customers and suppliers and help to form tight marketplace alliances.  

5. Information systems assist with long-term planning and provide scalable solutions to align with our long-term orientation.  

6. Information systems help us introduce new products/services in our market and support our first mover tendency  

7. Information systems help us take calculated business risks.  

8. Information systems help us generate innovative solutions through creativity and experimentation
Overall IT Strategy

The degree to which information systems are used within a company reflects the organization's overall technology strategy and often follows industry requirements. IT strategy also impacts how new technology is adopted by the organization. Please indicate to what extent you agree or disagree with the following statements relating to the overall use of information technology in the firm, with '1' meaning completely disagree, and '5' meaning completely agree.

(1=Completely Disagree, 5 = Completely Agree)

1. Our information technology strategy is clearly defined.  _1 _2 _3 _4 _5

2. Information technology is critical to our business.  _1 _2 _3 _4 _5

3. In our industry, firms have to invest heavily in information technology if they wish to compete.  _1 _2 _3 _4 _5

4. We adopt entirely new technologies to defend market position.  _1 _2 _3 _4 _5

5. We classify ourselves as early adopters of innovations.  _1 _2 _3 _4 _5

6. We have made significant modifications to the technologies we employ in our business operations.  _1 _2 _3 _4 _5

7. Our managers frequently see potential business opportunities created by information technology developments.  _1 _2 _3 _4 _5

8. Our business strategy is clearly defined.  _1 _2 _3 _4 _5
Innovation/Adoption Tendency

In addition to being an important aspect of IT strategy, innovation and the tendency to adopt new technologies are strongly impacted by industry and corporate culture. Please indicate to what extent you agree or disagree with the following statements relating to the adoption of innovation within the firm, with '1' meaning completely disagree, and '5' meaning completely agree.

1. This organization is always moving toward the development of new answers.  _1  _2  _3  _4  _5  
2. This organization can be described as flexible and continually adapting to change.  _1  _2  _3  _4  _5  
3. Our ability to function creatively is respected by the leadership.  _1  _2  _3  _4  _5  
4. Around here people are allowed to try to solve the same problem in different ways.  _1  _2  _3  _4  _5  
5. Creativity is encouraged here.  _1  _2  _3  _4  _5  
6. People in this organization are always searching for fresh, new ways of looking at problems.  _1  _2  _3  _4  _5  
7. The way we do things seems to fit with what we’re trying to do.  _1  _2  _3  _4  _5  
8. Work in this organization is evaluated by results, not how they are accomplished.  _1  _2  _3  _4  _5  
9. The methods used by our organization seem well suited to its stated goals.  _1  _2  _3  _4  _5  
10. My goals and the goals of this organization are quite similar.  _1  _2  _3  _4  _5  
11. Members of this organization would rather be working here than anywhere else.  _1  _2  _3  _4  _5  
12. In this organization we tend to stick to tried and true ways.  _1  _2  _3  _4  _5  
13. New ideas can come from anywhere in this organization and be equally well received.  _1  _2  _3  _4  _5  
14. Members of this organization feel encouraged by their superiors to express their opinions and ideas.  _1  _2  _3  _4  _5  
15. I have the opportunity to test out my ideas here.  _1  _2  _3  _4  _5  
16. In this organization, the way things are taught is as important as what is taught.  _1  _2  _3  _4  _5  
17. This organization is open and responsive to change.  _1  _2  _3  _4  _5  
18. My ability to come up with original ideas and ways of doing things is respected by those at the top.  _1  _2  _3  _4  _5  
19. The role of the leader here is to encourage and support individual members’ development.  _1  _2  _3  _4  _5  
20. The best way to get along in this organization is to think the way the rest of the group does.  _1  _2  _3  _4  _5  
21. Creative efforts are usually ignored here.  _1  _2  _3  _4  _5  
22. People here try new approaches to tasks, as well as tried and true.  _1  _2  _3  _4  _5
APPENDIX D

STRUCTURED INTERVIEW QUESTIONS
Structured Interview Questions

Manager Overview Questions

Department/Project/Team Overview:

QM1. Tell me about the role of Marketing Automation and its interaction with the Systems (IS) group and other functional areas.

QM2. What is the background of members of the Marketing Automation staff—marketing, technical, or both? What were the selection criteria in choosing the Internet team?

QM3. What training or preparation was provided to the team before the project launch?

QM4. Has the way the group interfaces with the IS group changed since the web site project?

QM4A. What kind of time frame did the project involve from initial pilot project?

QM4B. What were some of the initial goals for the project?

QM5. Can you give me an estimate of the total resource commitment in people, hardware, software, etc., for the development of the web site?

QM6. What was the total resource commitment (people, hardware, software, infrastructure) for development of the electronic commerce web project, versus repetitive operating resources and costs?

QM7. Did you use a traditional development methodology in terms of project life cycle, feasibility, requirements definitions, etc.?

QM8. Did the goals and site functionality change over time, evolving as you saw what you could do with it, or did the project stay on a fixed target with defined goals?

Electronic Commerce Impact and Future Direction:

QM11. In terms of the Internet and electronic commerce in general, do you think this is a long term market effect, is it here to stay?
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Q13. Is the move to electronic commerce on the Internet a change in the traditional market paradigm, or do you think it will always be supplemental to traditional business processes? What will drive the change?

Q16. What do you see as some of the criteria or improvements for Internet II that would increase the viability of electronic commerce over this medium?

Team Overview Questions

Project/Team Background:

Q1. Please tell me a little bit about your role in the project. Did you have a specialty that you brought to the project?

Q2. Tell me about the background of the project team. Were you hired specifically to work on the project or were you part of either marketing automation or IS?

Q3. What kind of training or preparation did you have when you joined the team?

Q4. When did the idea first come up to use the Internet for electronic distribution?

Q5. Is today's web site the result of what was expected, or is it a synthesis of ideas that have continued to evolve over time?

Q6. Can you give me an estimate of the development time, the number of hours, number of people resources, calendar timeframe from first start until you went live?

Q7. Did the team start with a formal requirements definition for the project before starting out, or was it more informal in terms of seeing what you could do with the technology?

Q8. Was there any kind of traditional project methodology (feasibility, requirements specification, etc.) or project plan developed by your team leader and programmers that the team followed?

Q9. What were some of the initial web site project goals, the drivers for this project originally, and did they define any measures?

Q14. As far as the other team members, how were they chosen -- was everyone an existing Marketing Automation person, or did they come from elsewhere?
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Q19. Did the goals and site functionality change over time, and where do you see it going, a future direction or mission?

Q20. What drove the project from a marketing aspect? Was it information, or more of the operational issue of distribution?

Vice President of Marketing Overview Questions

QVP1. Before the web site pilot was presented, what were some of your initial thoughts on using the Internet for business transactions?

QVP2. What considerations and concerns did you have in terms of making the decision to approve the second phase of the project, the actual electronic ticketing?

QVP5. In terms of the traditional ways companies are organized, one would expect to find technology driven projects under the IS function. Is electronic commerce different because of its large marketing component, or would you say its positioning under Marketing Automation is something unique to RAC?

Research Question Chain of Evidence

1. How are strategic technology fit, innovation and adoption tendency, and Internet commerce success related?

QVP3. Do you see RAC's electronic commerce strategy primarily as a distribution cost issue, or is it also a competitive issue, relative to the airline industry?

QM2A. When we talk about IS or IT strategy, does your organization drive that for marketing, or are you part of the overall company IS strategy?

QM2B. How is the use of technology to support strategy initiated within the firm, particularly when cross-functional areas are involved, such as the web commerce project?

QM3. Does RAC employ traditional EDI with suppliers, major customers, etc.? Will this change as the result of the Internet?

QM10. RAC's electronic commerce strategy relative to the competition--where was RAC in terms of implementing electronic commerce relative to the airline industry?
Q17. What were the expectations for project success and how did you know when you were going to achieve them?

2. What role does technology play in electronic commerce projects?

Q11. What part did technology play in the project, in the goals and achievements? Did technology drive the project or fulfill the initial plan?

Q11A. What were some of the tools and platforms that were considered, tried, and implemented, and did these change over the life of the project?

Q11B. As Internet technology and tools evolved, were you willing to try different options?

Q12. What were some of the greatest challenges, for example, linking to the real time operational data on the legacy system?

Q13. What were some of the concerns or challenges regarding secure transactions and network access that arose?

Q18. From the technical side, looking back on how the project has evolved to its current status, what were some of the technical aspects you’re happy with, wish had worked out differently, or still would like to accomplish?

Q19. How have your choices of technology changed over the life of the project?

Q21. Are there any project lessons you can share about time, resources, or ongoing commitment?

3. What are the critical success factors for successful implementation of electronic commerce Internet projects?

Q20. From your viewpoint, what are the critical success factors for successful implementation of electronic commerce Internet projects?

Q21. The critical success factors that you’ve identified for your project—do you think these apply to any kind of commerce, no matter what the industry?

Q22. Is there anything else about the project or how it is impacting your company that you can share with me?
4. How are business processes impacted by expansion of electronic markets on the Internet?

**QVP4.** Electronic markets have historically had some significant impacts on business processes within industries, i.e. when SABRE and Apollo were first introduced. Do you see the Internet long-term as having that kind of an impact? (maybe not just for airlines, but for other industries?)

**QMS.** What systems were impacted by the electronic commerce web site and how did they change?

**QMS9.** Is there a measurement mechanism in place to track activity or percentage of business moving from traditional methods to the commerce site? Can you share with me the percentage of change? Do you expect this to change over time?

**QMS12.** How would you describe the short and long term impact of the Internet on RAC, specifically, and the airline industry, in general?

**QMS15.** What concerns, if any, do you have as a manager, regarding electronic commerce transactions?

**Q15.** How are business processes impacted by automation of your transactions? Obviously the physical contact person has change, are there other steps?

**Q16.** What has been the customer response overall? Is there a measurable percentage of business transactions moving to Internet commerce?

5. To what extent does Internet commerce provide a transaction cost advantage over traditional processes?

**QMS7.** Electronic commerce transactions may bypass some of the traditional players in a business chain, often known as intermediaries; how did things change when you moved from a traditional business environment to an electronic commerce environment?

**QMS8.** As business process change, transaction costs may be impacted. Which business processes have a resulting cost impact when moving from traditional transactions to electronic commerce?

**QMS14.** The impact of reducing the number of steps in the value chain, i.e. bypassing the customer reservation agent, is that strictly a transaction cost issue to the company?
That is, if we have true disintermediation, will customers perceive that as negative or as a means of gaining more control?

Research Question Evidence Provided by Web Survey

6. How did the firm’s customers become aware of its electronic commerce web site?

Survey Section 3

7. How satisfied are customers with electronic transactions and their role in the transaction process, for example, the loss of intermediaries?

Survey Section 4

8. What concerns and expectations do customers have regarding electronic transactions and electronic commerce web sites?

Survey Section 5
Survey Comment Section 6
APPENDIX E

QUALITATIVE ANALYSIS CODING

AND INDEX TREE DIAGRAMS
## Sample Coding for Structured Interview Node

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<th>Node Name</th>
<th>Definition</th>
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<td>Structured Interview</td>
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<tr>
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<td>/StrucInv/Team</td>
<td>Team composition, roles, experience, skills, training</td>
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<td>/StrucInv/Team/Q1-ProjRole</td>
<td>Role in project, background, skills</td>
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<td>Team selection, company history, talent mix</td>
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<td>/StrucInv/Team/Q3-Training</td>
<td>Training and preparation for project</td>
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<td>/StrucInv/Time</td>
<td>Timeline, development, change control</td>
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Customer Survey Comments - Positive Index Tree Node
Customer Survey Comments - Negative Index Tree Node
Customer Survey Comments - Suggestions Index Tree Node
Structured Interview - Team Index Tree Node

(2:1) Team

(2:1) Q1: ProjRole
(2:1) Q3: Training

(2:2) Q2: TeamSelect

(2:2:1) Q1: TeamComp

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(3) Mpermission

(3.1) Depth/Entry

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(3.3) Technology

(3.4) Cost

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(3.7) Internet

(3.8) Intermediaries
APPENDIX F

SAMPLE QUALITATIVE ANALYSIS REPORTS
Q.S.R. NUD.IST Power version, revision 4.0.
Licensee: Sharon W. Tabor.

PROJECT: RAC, User Sharon W. Tabor, 12:30 pm, Sept 1, 1997.

******************************************************************************
(T 4) //Text Searches/Success
*** Definition:
Search for 'success', No restriction
******************************************************************************
+++ ON-LINE DOCUMENT: Manager
+++ Document Header:
*RAC Electronic Commerce Project Team Structured
Interviews - 5/09/97 Tape 2). -- Kevin Krone - Sr. Marketing Automation
Manager (MGR1)

+++ Retrieval for this document: 10 units out of 233, = 4.3%
++ Text units 68-72:

*Q20. PROJECT CSFS: FROM THE MANAGERIAL VIEW, WHAT ARE THE
CRITICAL SUCCESS FACTORS FOR AN ELECTRONIC COMMERCE PROJECT?

MGR1. I think that the actual process itself has to be user friendly, customer friendly,
fast, and of value, some sort of added value to them, the customer. And, that being either
more convenient, better pricing, some other added benefit. But, primarily, I think it has to
be as good as, as convenient as, and as quick as their current method of purchasing.
Otherwise, it won't work, unless you have an awful big carrot on the other side.

++ Text units 166-166:

*Q17. PROJECT SUCCESS: SUCCESS MEASURES IN RELATION TO THE
INITIAL PROJECT GOALS. WHAT WERE THE EXPECTATIONS FOR SUCCESS
AND HOW DID YOU KNOW WHEN YOU WERE GOING TO ACHIEVE THEM?

MGR1. We had a couple tangible success factors. One is, we actually had some goals for
number of transactions that would flow through the site, and so that's, and we're for the
most part on track with our projections. And they were fairly aggressive, and I think if
things continue, we'll be ok, but if things slow down for whatever reason, we'll have our work cut out for us. So, looking, we kind of had some initial projections out there, and those were thumbs in the wind, because who knew? No one knew. When you're leading the edge like that there's no one else you can call up and ask what can I expect, or you can't go to a book and see what you should expect. And then, kind of an intangible one is reaction from the press and customers, and so forth, and so we've again, have been very happy with the good compliments we're getting, through both of those channels.

++ Text units 231-233:

*QM17. ECOMM CSFS: AGAIN, WE'VE TALKED ABOUT CRITICAL SUCCESS FACTORS IN TERMS OF YOUR PROJECT; DO YOU THINK THOSE APPLY TO ANY KIND OF ELECTRONIC COMMERCE, NO MATTER WHAT THE INDUSTRY -- THE IDEAS OF VALUE AND ACCEPTANCE AND COST?

MGR1. Pretty much. I'm trying to think if whether I could argue in any case that they wouldn't. I think those are pretty fundamental issues that would apply regardless of industry. I'm sure there's probably some exceptions out there, that don't come to mind, but I think, in general, those are pretty basic tenets.

+++ ON-LINE DOCUMENT: TeamLead
+++ Document Header:

+++ Retrieval for this document: 14 units out of 210, = 6.7%
++ Text units 141-145:

*Q17 PROJECT SUCCESS: WHEN YOU STARTED WITH THE INITIAL PROJECT, DID YOU HAVE SOME GOALS IN MIND THAT WERE GOING TO TELL YOU WHEN YOU WOULD EVENTUALLY ACHIEVE SUCCESS? HOW WERE YOU GOING TO DEFINE SUCCESS IN TERMS OF THE PROJECT?

TL. Yeah, it's funny, you know, the original goal of the project was pretty visionary and I don't think we've accomplished it yet; so, there was a clearly understood idea that we wanted to be able to use the Internet as a mechanism for distributing our product. And, one of the things in question was, well just how big of a channel can this be? There are a lot of issues involved in that that we didn't know answers to -- like how many people are
really out there, how many people would really use this thing, put their money out there? And, so, I guess we had a wide range of expectations, but I think we've been pleased with the volume we've seen, and we feel like in just a little over a year we can see all those indicators, the number of people on the net, the number of people willing to buy, the number of transactions that are happening, all of that continues to increase. That's fueled by, not just us, but by a lot of companies realizing that this is a cheaper, faster, better way to do business with people who prefer it.

++ Text units 199-207:

**Q20. PROJECT CSFS: IN YOUR OPINION, SINCE YOU'VE NOW BEEN A TEAM LEADER AND YOU'VE SEEN A PROJECT COME THROUGH SEVERAL DIFFERENT PHASES, WHAT WOULD YOU SAY ARE THE CRITICAL SUCCESS FACTORS, WHAT ARE THE THINGS THAT HAVE TO HAPPEN RIGHT FOR AN ELECTRONIC COMMERCE PROJECT TO SUCCEED?**

TL. You have to have a commitment from your management that they're going to do this. They have to -- I would say that has to be an informed commitment -- they have to understand what they're getting into, and be cognizant of the fact, particularly if you're going to be the first guys out there, there's going to be some bumps in the road, and they have the willingness to support that in the beginning. You have to have, I think for us, the cohesiveness of our team was a huge factor; and I think that the various personalities and backgrounds that each of the folks brought to the table was an important consideration. I think that if you just throw half a dozen C++ programmers, or if you throw a half dozen marketing types in a room together, you're going to be unhappy, because this medium requires technical sophistication, and also customer, people focus that usually doesn't come with technical sophistication! So, you've got to mix those two things together, and from at least my experience that has not been a typical kind of team.

**Q20A. THE INTERNET IS KIND OF A DIFFERENT DEVELOPMENT ENVIRONMENT THAN WE'VE SEEN BEFORE IN INFORMATION TECHNOLOGY.**

TL. It is, and you know, part of the thing is, you've got to realize your users will never have a manual, you're lucky if they'll push a help button, and so, they've got to be able to use your software with zero training, and you can't really assume much in terms of literacy, as far as computer skills go. You've got to keep that in mind when you're designing your site.
*Q17. PROJECT SUCCESS: RELATED TO THE INITIAL PROJECT GOALS, WHAT WERE THE EXPECTATIONS FOR SUCCESS AND HOW DID YOU DEFINE IT; WHEN DID YOU KNOW YOU HAD A GOOD SITE?*

TM1: Actually, we felt right off the bat we got so much positive public relations media and exposure and things like that; we were very surprised how people picked it up and put it on the front page of their business sections, and, you know, talked about calling us a technology leader -- which in our history of 25-26 years now, it's like, we've been anything but (laugh)! It's one of our strengths that we're so independent that we're able to do things the way we want to do them, and hopefully, we'll be able to continue to do that because we really can control our costs by keeping our destiny in our hands.

And, another measure I guess we do is number of visitors; we're just very, very pleased, we look at, we ourselves do not publish or disclose our figures, but we look at what other people disclose in the press and we're very pleased with how we measure up against them.

*Q20: PROJECT CSFS: IN YOUR OPINION, WHAT ARE THE CRITICAL SUCCESS FACTORS FOR ACHIEVING SUCCESS WITH ELECTRONIC COMMERCE PROJECTS, IN GENERAL?*

TM1: In general, I think acceptance by your end user, the consumer, that they're comfortable with the security measures you're taking and that in our case they feel like if they were to pick up the phone or get on the Internet, they'd get the same thing. They're going to see the same price and product. Also, one of our other tests is that it needs to be as quick and as easy as a phone call. I mean, certainly the challenges of the Internet traffic...
these days and the speed with which they're moving, we probably aren't hitting that goal, but that's probably where we'd like to be some day, to be able to say oh, whether you get on the computer or pick up the phone, it's going to be the same. And, we also have one last thing called the 'Dad Test,' which was if our dads can do it, then we felt like we hit the mark. I know that when you're in the middle of a project you get to where you can't see the forest any more, you're looking at the trees so closely, so we wanted to step back and say, ok can my dad sit down and figure this out? Because, airline language, airline fare pricing, all of that is nothing, there's nothing about to make sense, it's so arbitrary and crazy, so that's what we always keep in our minds to this day, and probably always will, can my dad do it?
QM17. ECOMM CSFS: *IN YOUR OPINION, IN WHAT YOU'VE SEEN SO FAR WITH THE SITE, AND WHAT YOUR PAST EXPERIENCE HAS BEEN, ARE THERE SOME SPECIFIC CRITICAL SUCCESS FACTORS THAT YOU CAN IDENTIFY FOR PEOPLE GOING ON THE INTERNET AND USING IT FOR ELECTRONIC COMMERCE?*

TM2. You mean, if a new site were to come up

QM17A. *YES, SOMEONE JUST GETTING INTO THE PROJECT PHASE, OR JUST THINKING ABOUT IT. WHAT ARE THE THINGS THAT ARE GOING TO BE CRITICAL FOR THEM?*

TM2. Well, if they expect it to be accessed a lot, it needs to be fast, you'd consider having a server that will support a lot of access. They need to have a large pipe to their site; if they're actually going to do the commerce part of it, they need to have secure transactions so they can do that, and we all need to push the fact that a secure transmission is ok in the public side. Be willing to change with technology, since the Internet is a fluid medium, and the public expects you to pick up on that, and the customers at times think your company is stale, if the visible part of you is stale. So, I think it’s incumbent upon the company to stay up with technology and change with it. We're a little bit, and we're probably like other people, we're a little bit limited in that. When I was talking about going to Java applets, there's only a few browsers that are available to use that. We still have text only browsers that hit our site. So, Java's not available for those. You have to support the full spectrum. And, so, I guess another thing would be that you need to support the training of the technology, your technology experts in new aspects, whether that means commercial training, purchasing a book, so they can read about it, affording them time to read, and play with it, and understand new technology. I was able to do that at Oak Ridge; here, being new, I haven't found a way to do that yet, I think I can. Kevin is very supportive of almost anything we want to do, as long as it supports the site. I'd say my personal technique is to buy a book, if I see something that I'm interested in, think it's good, I'll go buy a book and try it out and play with it or something. So, those are some of the factors I think is critical for a new site coming up.
REFERENCES


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