

CAPTURING THE LONGITUDINAL DYNAMICS OF CUSTOMER-  
SUPPLIER RELATIONSHIPS: AN EMPIRICAL EXAMINATION  
OF THE ROLES OF IT, TRANSACTION ECONOMICS  
AND SOCIAL EXCHANGE

by

WILLIAM WAYNE WILLETTE

Presented to the Faculty of the Graduate School of  
The University of Texas at Arlington in Partial Fulfillment  
of the Requirements  
for the Degree of

DOCTOR OF PHILOSOPHY

THE UNIVERSITY OF TEXAS AT ARLINGTON

December 2006

Copyright © by William Wayne Willette 2006

All Rights Reserved

## ACKNOWLEDGEMENTS

This thesis owes its existence to a great many people. Words cannot express the gratitude and appreciation I have for the people who supported this work.

I would like to thank my wife, Kathleen, who encouraged me and commiserated with me all through this arduous endeavor. Her patience and understanding during the long hours that stretched into months is a monument to her love for me. I only hope seeing this work completed brings her as much joy as its construction brought her anguish. I also owe an expression of thanks to my brother Roger and his wife Kim for all their support and consideration.

A great deal of thanks goes to my dissertation chair, James Teng Ph.D. His scholarly mentorship and gentle guidance has been more than a crucial element in the completion of this thesis; his research discipline and careful thought processes has been and will continue to be an inspiration to me.

I would like to thank the rest of the members of my dissertation committee: Mark Eakin, Ph.D., Radha Mahapatra Ph.D., Edmund Prater Ph.D., and Abdul Rasheed Ph.D. They have shown considerable patience with my work and have given me insights into what it means to be a researcher.

Finally, I would like to express special thanks to my friend, Anil Singh. He has trudged through the worst of this dissertation with me and his suggestions have been invaluable. He was generous with his time and talent; I owe him immensely.

November 15, 2006

## ABSTRACT

### CAPTURING THE LONGITUDINAL DYNAMICS OF CUSTOMER-SUPPLIER RELATIONSHIPS: AN EMPIRICAL EXAMINATION OF THE ROLES OF IT, TRANSACTION ECONOMICS AND SOCIAL EXCHANGE

Publication No. \_\_\_\_\_

William Wayne Willette, Ph.D.

University of Texas at Arlington, 2006

Supervising Professor: James T. C. Teng

The forms of cooperative business hold the promise of reduced costs, increased efficiencies, rapid market and environmental responses, expanded market opportunities, new resources, faster product developments, and the most coveted of all benefits—competitive advantage. These cooperative business forms are a rich matrix for the exploration and testing of a wide range of theories, such as Transaction Cost Economics, Social Exchange Theory, Resource Dependence Theory, and Relational Exchange Theory.

This thesis presents a process view of how IT and trust affect transaction costs in a transaction dyad consisting of a small supplier and a large customer. It goes beyond functional relationships between variables to examine empirical connections between sequences of events and outcomes. The thesis presents a dual perspective of affective elements; the IT buildup

represents the technological aspects of changes in transaction costs and the Trust buildup represents the human aspects.

The base model emphasizes the impact on transaction costs by IT and trust buildups over time. Trust buildup was shown to be the strongest determinant of the reduction in transaction costs; IT buildup demonstrated that it too could reduce transaction costs, but with less influence than trust buildup. The mediating effects of trust buildup are significant on the relationship between IT and changes in transaction costs. However, IT does have a direct impact on transaction costs and is an important consideration in decisions regarding transaction costs between trading partners of unequal size.

## TABLE OF CONTENTS

ACKNOWLEDGEMENTS .....	iii
ABSTRACT .....	iv
LIST OF ILLUSTRATIONS .....	ix
LIST OF TABLES .....	x

### Chapter

1. INTRODUCTION .....	1
1.1 Large Business Interests .....	2
1.2 Small and Medium Enterprise Interests.....	2
1.3 Research Question .....	4
1.4 Importance of Topic.....	7
2. LITERATURE REVIEW .....	11
2.1 Theoretical Foundation.....	11
2.2 Transaction Cost Economics.....	11
2.2.1. Asset Specificity .....	13
2.2.2. Opportunism .....	14
2.2.3. Trust .....	15
2.2 Social Exchange Theory .....	16

2.3 Resource Dependence Theory .....	18
2.4 Relational Exchange Theory.....	22
2.5 Summary .....	25
2.6 Previous Research and Study Motivation.....	25
2.6.1. Market versus Hierarchy.....	26
2.6.2. Relational Governance.....	28
2.6.3. Role of Information Technology .....	32
2.6.4. Small and Medium Enterprises.....	34
3. RESEARCH MODEL AND HYPOTHESES .....	40
3.1 Research Model .....	40
3.1.1. Construct Measures.....	42
3.1.2. Research Hypotheses .....	43
3.1.3. Research Methodology .....	48
4. INSTRUMENT DEVELOPMENT .....	51
4.1 Measures of IT Buildup .....	51
4.2 Measures of Trust Buildup.....	52
4.3 Measures of Changes in Transaction Costs .....	52
4.4 Measures of Transaction Environment.....	54
4.5 Second Order Constructs .....	54
4.6 Summary .....	55

5. DATA COLLECTION AND ANALYSIS.....	56
5.1 Survey Technique .....	56
5.2 Pilot Survey.....	57
5.3 Data Collection .....	57
5.4 Statistical Technique Selection.....	58
5.5 Sample Size.....	59
5.6 Data Preparation.....	59
5.6.1. Outlier Data.....	59
5.6.2. Missing Values for Data .....	59
5.6.3. Key Informant Bias.....	60
5.6.4. Non-response Bias .....	60
5.7 Sample Respondent Demographics .....	63
5.8 Data Analysis .....	65
5.8.1. Assessing the Measurement Model .....	65
5.8.2. Convergent Validity.....	65
5.8.3. Discriminant Validity.....	67
5.8.4. Assessing the Structural Model .....	68
5.8.5. Testing the Hypotheses.....	69
5.9 Open-ended Questions.....	77
5.10 Summary.....	79
6. DISCUSSION AND CONCLUSION.....	81

6.1 Discussion.....	81
6.1.1. Contribution.....	81
6.1.2. Contribution to Research.....	82
6.1.3. Contribution to Practitioners.....	84
6.2 Limitations and Assumptions.....	85
6.3 Future studies.....	88
6.4 Conclusion.....	89

## Appendix

A. BENSOU'S CONTEXTUAL PROFILE FRAMEWORK.....	90
B. SUMMARY OF KEY MANUFACTURING STUDIES.....	92
C. QUESTIONNAIRE.....	96
D. SURVEY LETTER.....	106
E. SURVEY FRONTPAGE.....	108
F. ITEM TO CONSTRUCT LOADING - FULL MODEL.....	110
G. ITEM TO CONSTRUCT LOADING - TRIMMED MODEL.....	112
H. CROSS LOADINGS.....	114
REFERENCES.....	117
BIOGRAPHICAL INFORMATION.....	126

## LIST OF ILLUSTRATIONS

Figure	Page
3.1 Research Model .....	41
5.1 Measurement Model – 5 Years Ago .....	68
5.2 Measurement Model – Current .....	68
5.3 Structural Model .....	69
5.4 IT - TC Regression by Environment .....	72
5.5 Trust - TC Regression by Environment .....	74
5.6 IT - Trust Regression by Environment .....	76

## LIST OF TABLES

Table	Page
3.1 Contributing Studies Synopsis .....	44
4.1 Measures of IT Buildup .....	52
4.2 Measures of Changes in Transaction Costs .....	53
4.3 Second Order Construct Validity .....	54
5.1 Non-response Bias Items .....	60
5.2 Analysis of 2005 Sales .....	61
5.3 Analysis of Number of Customers .....	61
5.4 Analysis of Years of Service .....	62
5.5 Analysis of Annual Purchases .....	62
5.6 Respondent Demographics .....	63
5.7 Respondent Demographic Groupings .....	63
5.8 Model Status for TC Items .....	66
5.9 Correlations, CR, and AVE Values (N = 301) .....	67
5.10 Mediation of Trust Buildup .....	71
5.11 Descriptions of Product P .....	77

5.12	Improvements by Supplier .....	78
5.13	Improvements by Customer .....	78

## CHAPTER 1

### INTRODUCTION

The spectrum of business relationships in general swings from the extreme of spot market transactions (markets), to full vertical integration (hierarchies), with a hybrid governance strategy of relationalism. The role of relationalism in modern business transactions has taken a greater significance in recent years due to the emphasis on joint ventures, alliances, and supply chain integration. The benefits from these cooperative business forms have spurred intense interest from both academics and practitioners.

From a practitioner perspective, the forms of cooperative business hold the promise of reduced costs, increased efficiencies, rapid market and environmental responses, expanded market opportunities, new resources, faster product developments, and the most coveted of all benefits—competitive advantage. From the academic perspective, these cooperative business forms are a rich matrix for the exploration and testing of a wide range of theories, such as Transaction Cost Economics, Social Exchange Theory, Resource Dependence Theory, and Relational Exchange Theory. The combination of cooperative business forms and these theories apply to private and public organizations, industry and service sectors, and both large and small entities.

## 1.1 Large Business Interests

Large businesses in particular have developed a keen interest in relational business arrangements. They have turned to the inherent efficiencies and idiosyncratic resources found in tightly coupled supply chains to create or enhance competitive advantage. By carefully selecting and nurturing a small group of providers, large business can attain the control of vertical integration together with the cost efficiencies of an open market. When the provider is a small or medium-sized enterprise (SME), usually with specialized “niche” capabilities, the large business can also tap rapid innovation skills and close market contacts that help to assure sustained competitive advantage.

## 1.2 Small and Medium Enterprise Interests

The SME’s benefits from relational arrangements are not as pronounced as those for large businesses. Depending on the depth and scope of the relational ties, the SME could benefit from the greater resources of the large business, have quicker access to more markets, or assure growth more easily than it could alone. However, SMEs is also likely to find itself subservient to large businesses, catering to their demands and policies. Ideally, the arrangement between them is a strategic partnership where each party’s fate is intricately linked to the other party and both parties strive to benefit the dyad, not opportunistically benefit only themselves.

Thus, the relational arrangement between SME and large businesses can be placed along a continuum between the extremes of arm’s length transactions (market) and virtual integration (hierarchy). The SME, especially a SME supplier, typically does not have the physical resources

to equal the investment of a large customer in the relationship; therefore, the SME usually finds itself disadvantaged compared to the larger partner, suffering from a lack of resource leverage and bargaining position in the arrangement. The SME supplier does, however, bring intangible assets to the relationship that a large customer needs, such as closer market ties and rapid production change capabilities. The SME generally engenders itself to the larger customer by providing these intangibles, often highly customized, that the large partner could not obtain elsewhere without considerable expense and time.

In conjunction with these intangible assets, the SME supplier uses IT to strengthen the communication ties with the large customer and increase the idiosyncratic information content in the relationship, thus further cementing the relational bonds between them and making it more difficult and more costly for the large customer to switch providers. This strategy moves the SME supplier and the large customer closer toward a strategic partnership.

The role of IT in this strategy has become increasingly more significant for the SME. The cost of IT hardware and software has decreased and the capabilities of IT have increased dramatically in recent years to the point where the SME can afford to be on equal IT footing with large counterparts. Also, the IT competency and confidence of SME employees have been enhanced through general technical education of the public and also by the user-level simplification of IT applications. The general business climate also has changed so that IT capabilities between supply chain participants is an expected and necessary part of doing business.

The end result is an increasing role for IT in daily business transactions to improve efficiency and also in strategic decisions that impact effectiveness and competitiveness. The move toward relational governance between trading partners throughout the supply chain

accentuates the importance of interorganizational IT. Since the current trend for large business is to align itself with a few, capable SMEs, it is important to study how SMEs develop a more relational association with large customers and the role IT plays in the transition.

### 1.3 Research Question

Prior research on relational governance mechanisms can assist in identifying potential research questions focused on the SME and IT.

Therefore, some research questions that can be addressed include:

- How do SME suppliers increase their chances of survival by means of adaptive efforts such as improving relations with their large customers?
- What is the role of IT and trust in SME's adaptive efforts?
- How are these adaptive efforts shaped by levels of transaction costs and in turn affect expected outcomes on transaction costs?
- How are the temporal relationships between transaction costs and these adaptive efforts moderated by transactional environmental conditions—market, hierarchy (customer dominate)?
- What is the direct impact of IT on transaction costs?

Research to date has been fragmented and incomplete in studying relationalism in the strategic plans of small and medium enterprises (SME), and especially the role information technology (IT) plays. As more companies use e-commerce to deal with other companies, firms are more prone to keep known, reliable partners rather than utilizing the market place to save costs but risk unknown performance by unknown vendors [85]. A level of trust, commitment,

and information sharing sufficient for mutual productivity and technological gains cannot be attained with every one of a large number of suppliers who compete on price; the formation of strategic partnerships requires careful supplier selection because a firm must build on the expertise and commitment of its suppliers [127].

Subramani [130] found that IS use with relationship-specific intangible assets can extend IS into a lever for differentiation; differentiation is a Porter and Millar [113] strategy in which information can provide competitive advantage. Stuart [129] found in the semiconductor industry that young and small firms gained greater benefits from large and innovative strategic alliance partners than did large and old organizations. Also, smaller firms seem to benefit more from proactive alliance formation than large firms do [122]. Yli-Renko et al. [143] found that young technological firms with greater market and technological knowledge acquired from their large, key customer, produced larger numbers of new products, developed greater technological distinctiveness, and realized lower sales costs; knowledge acquisition seems to be a key mechanism to leverage collaboration into the development of technical competence and cost efficiencies.

Partnerships, especially information partnerships, can offer novel incentives, diverse services, joint marketing programs, new distribution channels, as well as operational efficiencies and revenue enhancements; in summary, partnerships can make big companies look small and small companies look big [87]. Kagan and Lau [82] concluded that as small firms develop more sophisticated IS applications, the IS should be tailored to more strategic or tactical applications. Small firms generally adopt EDI due to market pressures by more powerful and larger trading partners [76].

IT sophistication allows small firms to exploit the benefits of new technologies, either proactively as contingencies for an uncertain future or reactively as an alignment with contextual environments [110]. Each major business sector has shown increasing use of IT due to diminishing prices and increasing capabilities [24] that has provided equal IT power to large and small firms. However, increasing use of IT has shown a correlation with firms becoming smaller, especially in the manufacturing sector [24]. Firms with less vertical integration have higher levels of IT investment [43]. Harrison et al. [69] found that the decision to adopt an IT by a small business is typically a function of attitude, subjective norm, and perceived behavioral control. Thong [132] investigated the adoption of IS by small business and found significance only in the organizational characteristics of employees' IT knowledge, information intensity, and business size. IT can be used strategically by small firms to maintain competitiveness and sustain favorable positions within their industrial sectors [16].

Companies are finding the way to maximize profits is by limiting the number of suppliers selected with an emphasis on quality, innovation, and information sharing [7]. Efficiency, flexibility, and timeliness can be increased by free sharing of information providing that the technical infrastructure is in place and an atmosphere of trust and partnership exists [7]. Raymond [115] stated that the research findings obtained in a big business environment cannot necessarily be generalized to small business as the organizational context of a small firm is fundamentally different. Small firms have limited bargaining power with suppliers and customers, less task specialization, and managers must resolve problems covering a wide decisional and functional spectrum.

## 1.4 Importance of Topic

The Small Business Administration's Office of Advocacy generally classifies small business as firms with 500 or fewer employees. Over 99% of all firms in the United States are classified as small businesses and over 98% employ 100 or fewer. Small business in the United States generates 60 to 80% of net new jobs annually and creates more than 50% of non-farm, private gross domestic product. In 2002, the SBA recorded that there were 17,000 more small-business firms going out of business than going into business. The manufacturing industries alone shouldered over 40% of this loss while all other industries bore the rest. In general, two-thirds of new firms survive at least two years, and about half survive at least four years [123]. These impressive yet alarming numbers emphasize the importance of small business to the US national economy, the creation of new jobs and new products, and the urgent need for research to address survivorship issues, especially for the manufacturing sector.

Survival in today's business environment is heavily dependent on the efficiency and effectiveness of supply chain operations; i.e. on skills and conditions external to the organization. Baum et al. [11] observe that multiple studies confirmed the greater influence of extra-organizational factors on the fates of startup companies than intra-organizational factors. The main goal of any supply chain is superior market performance, getting a high quality product into the consumer's hands at the lowest possible total cost. Supply chains that are highly proficient require close cooperation among the participants. Partnerships, especially information partnerships, can offer novel incentives, diverse services, joint marketing programs, new distribution channels, as well as operational efficiencies and revenue enhancements [87]. The operational efficiencies of supply chain partnerships cannot exist in isolation; they must function in concert with appropriate information exchange to be effective.

Information sharing has been shown to provide significant inventory reduction and cost savings to manufacturers [91]. Venkatraman and Henderson [136] contend that effective performance comes more from leveraging intellect and knowledge and less from economies of scale in operations or other physical sources. The use of information technology has become a major lever in the quest for business success for all businesses and especially for small business which has found IT to be an equalizer in dealings with large business. Each major business sector has shown increasing use of IT due to diminishing prices and increasing capabilities that has provided equal IT power to large and small firms [24]. IT has been used strategically by small firms to maintain competitiveness and sustain favorable positions within their industrial sectors [16]. In general, IT-enabled productivity gains have been higher in manufacturing industries than in services [41]; also, firms with less vertical integration have higher levels of IT investment [43]. With increased outsourcing of functional areas in business, a major role for IT-enabled information exchange in supply chains has been the establishment and enhancement of customer-supplier relationships.

The decision to use IT within a customer-supplier relationship can even encourage a commitment to establishing relational behavior [63]. The application of IT in relationship enhancement has been elevated into a recognized form of competitive advantage. Relational behavior is self-perpetuating; it provides intangible benefits that reinforce the continuation of the relationship, thus enhancing the survivorship of the participants. As more companies use e-commerce to deal with other companies, firms are more prone to keep known, reliable partners rather than utilizing the market place to save costs but risk unknown performance by unknown vendors [85]. Modern businesses have discovered that a level of trust, commitment, and information sharing sufficient for mutual productivity and technological gains cannot be attained

with every one of a large number of suppliers who compete on price; therefore there is need to form strategic partnerships [127]. Since most small businesses supply larger customers, the role of IT and strategic relationships is crucial to their survival.

Small firms generally adopt specific IT applications, such as electronic data interchange (EDI), due to market pressures by their more powerful and larger trading partners [76]. However, small firms are not content solely with adoption, they embrace more specialized applications as they grow. As small firms develop more sophisticated IT applications, the use becomes more tailored to strategic or tactical applications [82]. IT sophistication allows small firms to exploit the benefits of new technologies, either proactively as contingencies for an uncertain future or reactively as an alignment with contextual environments [110]. It is well known that small businesses have an edge over large business because they are quicker to adapt and more likely to innovate. One of the principal strengths of small business is the speed and flexibility in exploiting social capital. Small businesses typically have more holistically complete knowledge of business processes and tacit knowledge sources which gives them the ability to rapidly marshal human and non-human resources to capitalize on opportunities. This skill has not gone unnoticed by large business which has judiciously included small business in supply chains, joint ventures, and acquisitions.

In summary, the issue of IT-enabled relationalism for small to medium-sized suppliers of large customers is central to the question of small firm survival and growth; it is also reflective of the current business environment where large firms nurture outsource relationships with carefully selected, smaller providers who can provide the traditional benefits of small business at nominal cost with a high degree of reliability. These relationships are not only considered the wave of the future, but also represent a source of sustainable competitive advantage and growth

for both parties. Only a few research projects have considered firm size as a variable in the study of competitive advantage and no research has been done to holistically examine firm size, IT, trust, and the overall business environment in a longitudinal study that can capture the “how” of achieving a relationship with the potential of sustained competitive advantage.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Theoretical Foundation

This research derives its theoretical foundation mainly from Transaction Cost Economics (TCE) and Social Exchange Theory (SET); in addition, Resource Dependence Theory (RDT), and Relational Exchange Theory (RET) provide ancillary support. Governance forms today are matched to minimized costs of exchange [86], strategic choice, and environmental conditions [48].

#### 2.2 Transaction Cost Economics

TCE focuses on the governance of contractual relations in transactions between two parties [139]. Its underlying premise is that transaction costs result from the need to establish and maintain contracts to support an exchange [140]; the actual level of transaction costs is determined by certain characteristics of that exchange—the frequency with which transactions occur, the level of uncertainty surrounding the exchange and the presence of transaction specific assets [4]. TCE draws from organization theory, economics, and contract law to explain why different governance structures are selected by managers and their environment to coordinate

exchange, paying close attention to the costs of negotiating, assembling information, and monitoring performance [48].

TCE presumes that market-based exchange is generally preferred for its flexibility and efficiency [48]. However, TCE uses three elements to explain why and when hierarchy will supplant market governance: opportunism, bounded rationality, and asset specificity [61, 139]. Hierarchies have been shown to replace market governance in situations exhibiting high asset specificity combined with bounded rationality and opportunism [12].

One of TCE's major approaches holds that transaction-cost economizing determines the efficient boundaries between firms and markets [12]. Unfortunately, it is impossible to contractually specify every contingency involved [139]. When faced with competitive conditions, firms will seek an appropriate governance structure to minimize transaction costs; some of these costs arise from the setup, operation, evaluation and realignment of the governance structure itself [86].

To minimize the costs of partner-related performance evaluation, firms may resort to hierarchical controls in strategic alliances [139]. The greater the transaction costs, the more likely the alliance will utilize hierarchical governance [30]. Alliances possess the unique feature of mutual interdependence where one or both parties are vulnerable to the other and behaviors are not always controllable [108]. The parties are not contractually bound in the classical sense, but instead share the expectation of continued exchange beneficial to both parties; these expectations encourage interdependence [48, 94]. Successful alliances achieve mutual benefits from superior performance in previous transactions, understand the other party's preferences and capabilities, and anticipate the continuation of satisfying exchanges in the future [48].

Cooperation between partners in an alliance may be positively related to time horizons, either the actual duration of the cooperative relationships or the perceived likelihood of the alliance lasting past the current duration period. Additionally, the speed and reliability with which partners learn about each other's actions is directly related to the degree that the exchanged information is imperfect. A firm's action may be based on the reputation of the partner, as well as concern for its own reputation, in addition to the payoff structure. In environments of questionable or absent reputation, the appropriate governance structure is based on the perceived probability of opportunism [108]. Thus, a degree of uncertainty can be alleviated through experiential transactions and perceptions of relationship longevity or firm-related reputations.

The dynamic changes in the internal and external environments of firms may alter the initial payoff conditions and contribute to improvement or deterioration of the structural viability of cooperative relationships. Reciprocal behavior is encouraged by long time horizons, frequent interactions, and high behavioral transparency [108]. If the fixed costs of governing the exchange can be amortized over frequent transactions then relational governance may more efficient for organizing transactions [48]. However, the question of how transaction costs are controlled by the development of relationships is still largely unknown and debated from both the perspective of controlling costs and the perspective of relational development.

### ***2.2.1. Asset Specificity***

Asset specificity is the extent that one partner's assets are specialized to the other partner. The investment of specific assets can be used to reduce the potential for opportunism by locking partners into an alliance where the anticipated long-term gains from the relationship will exceed the potential short-term gains from opportunism [108, 139]. This situation generates substantial

risk for one of the parties [12]; however, asset specificity may tie members together by limiting the flexibility of pursuing other alternatives or dampening the likelihood of terminating the relationship [144].

As assets are created or modified for a specific use, their value in other settings may be drastically diminished [144]. Idiosyncratic investments lose value if transferred to other uses, so exchange partners may become committed to making the existing relationship succeed. Therefore specific asset investment, and other forms of economic hostages, serve to secure commitment to the alliance [108, 139].

As asset specificity increases, more complex contracts must be written to specify each party's behavior should potential contingencies arise; as the complexity of contracts increase, the costs of creating the contracts, monitoring the performance of the contract stipulations, and enforcing those stipulations rise dramatically. Therefore, as TCE predicts, the transactions costs rise as asset specificity increases. Offsetting investments can reduce the requirement for legal contracts and thus lower transaction costs [4]. Reciprocal investments are a signal of a party's willingness to share the risks and responsibilities of transaction exchange by creating a safeguard in the form of mutual hostages [139]. Thus, transaction costs may decline as contract negotiations become more accommodative and the increased interdependency created by idiosyncratic investments are reflective of the parties' desire to maintain the vitality of the relationship [4].

### ***2.2.2. Opportunism***

The overarching theme that unites alliances is that each party needs the other to advance individual interests, yet these needs are coupled with behavioral uncertainty to create vulnerability to opportunism [108]. Behavioral uncertainty is concerned with the difficulty of

observing and measuring compliance to contractual arrangements and the difficulty of measuring the performance of these parties [30]. Williamson defines opportunism as self-interest seeking with guile; some people will behave opportunistically when certain circumstances are present [139].

When two partners commit to a contract requiring specific investments, they enter a relationship of mutual dependence; market forces will no longer be able to discipline the partners for their opportunism [30]. The perception of opportunistic behavior would result in governance structures involving great coordination and compliance costs, including high expenditures for drafting, negotiating, monitoring, and enforcing contingent claims contracts [108].

In strategic alliances, cooperation is maintained by each firm comparing the immediate gain from opportunism with the possible sacrifice of future gains resulting from the relationship [108]. As time develops an evolving history, each partner can assess the willingness and ability of the other party to abide by the letter and spirit of the partnership agreement. The better the match between expectations and past outcomes, the more confident a firm's decision makers will be in believing that a partner will follow through on its current promises. Sustained matches between behavior and expectations of cooperation may reduce the fear of opportunism and reinforce the growth of trust, thus reducing the need for costly stipulations [108].

### ***2.2.3. Trust***

Factors suggested by both TCE and Social Exchange Theory are related to the concept of trust [144]. In a situation where trust is low and there is high asset specificity, market-type contracting will not be an efficient way to conduct transactions; an governance structure that includes trustor and trustee will be formed [12]. After having created a joint organization, mutual trust should develop and transaction costs should be reduced substantially [12].

Trust has been found to be positively related to the economic constraints of TCE, the quality of communication, and to the existence of shared values between the trading partners [144]. Trust results from past experience and prior interaction and thus, develops as a relationship matures [108]. Williamson acknowledged the benefits of trust when he argued that idiosyncratic exchange relations featuring personal trust will survive greater stress and will display greater adaptability [139]. Also, with growing trust there is an increasing willingness to put oneself at risk, be it through intimate disclosure, reliance on another's promises, or sacrificing present rewards for future gains [108].

The tenets of TCE, in brief, leads one to believe that dyad relationships are formed to offset transaction costs and lessen the risk of opportunism to a degree that contractual arrangements cannot achieve. These relational, adaptive efforts have been treated in extant research as a "black box" where the internal mechanisms are largely unexplored and whose effects are mostly assumed intuitively. This thesis wishes to examine the workings of that "black box", especially over time. The changes wrought by time are crucial in understanding how the relationships develop and which adaptive efforts are effectual.

## 2.2 Social Exchange Theory

Several scholars have criticized TCE perspectives on alliances for its singular focus on partner opportunism and its failure to capture the social exchanges and managerial relationships during the formation and post-formation phases of an alliance [103]. According to Social Exchange Theory (SET), a social exchange is a situation where the actions of one person provide the reciprocal rewards or punishments for the actions of another person in repeated interactions [21].

Through these repeated interactions, relationships grow, develop, deteriorate, and dissolve as a consequence of an unfolding social exchange and coordination process; this process can be viewed as a bartering of rewards and costs between the partners [21, 74]. Since there is no way to guarantee an equivalent return for a favor, social exchange requires trusting others to discharge their obligations, trusting others to reciprocate, and proving oneself trustworthy. The benefits of social interaction are intrinsic in nature and therefore have no exact price; but the establishment of a friendly partnership requires investments that equate to commitments to the other party [103].

Committing time, resources, personnel and physical assets can promote more active involvement between managers and their counterparts in the alliance. Reciprocal commitments in terms of personnel and assets can promote the knowledge connections between partners [103]. Knowledge connections facilitate the sharing and communicating with partners for creation of new knowledge [77]. Alliances with other firms have been found to be one means to acquire new knowledge, skills, and expertise to enhance the competency of an organization. Alliances speed up the rate of innovation, overcome financial constraints, and gain access to resources otherwise unavailable to them [103].

Through these relational processes partners learn about each other's competencies and develop confidence in one another. Trust is one element that can enhance the openness and accessibility to each other that is required in an alliance; openness motivates the partners to be more transparent, increases the relationship's scope, and promotes mutual knowledge transfer between firms [103, 144]. Mutual trust can have a positive impact on the desire and ability of the partners to adjust to changing environmental demands through modification or termination of the

agreement [144]. Zaheer and Venkatraman found that trust increased the scope of joint planning and action by partners in strategic alliances [146].

Although the research is replete with factor analysis substantiating the impacts of trust in a relationship, there has not been an examination of the dynamics of changes in trust; such study is essential to an understanding of how dyadic relationships develop over time.

### 2.3 Resource Dependence Theory

The Resource Dependency Theory (RDT) is based on two underlying assertions—the resources and capabilities possessed by competing firms may differ (resource heterogeneity) and these differences may be long lasting (resource immobility) [99]. RDT holds that firms maximize profits through using and developing their resources [36, 142]. The contribution of this theory is the idea that firms should focus attention on developing internal assets and processes and therefore should foster processes that are inimitable and leverage core resources [84]. Resources include financial, technological, physical and managerial [40]. These firm resources have been classified into three categories: physical capital resources, human capital resources, and organizational capital resources. Physical capital resources include physical technologies used in a firm, the plant and equipment, the geographic location, and also access to raw materials. Human capital resources include training, experience, judgment, intelligence, relationships, and the insights of managers and workers. Organizational capital resources include the firm's formal reporting structure, formal and informal planning, controlling, and coordinating systems, in addition to the informal relations among groups within a firm and between a firm and its environment [9].

One weakness of TCE is an over-emphasis on cost minimization, thus neglecting the value creating aspect of a transaction; RDT, on the other hand, assumes that firms try to maximize long-run profits through exploiting and developing their resources [134]. The resource-based theory views firms as bundles of resources; alliances arise when firms need additional resources that cannot be purchased via market transactions [142]. For TCE the governance structure is mainly determined by the extent of asset specificity involved in the transaction concerned; whereas RDT's approach is to examine the nature of the resources involved. There is, to some extent, a similarity between TCE and RDT because asset specificity is related to the nature of the resources. However, RDT takes a broader view; it does not consider only the resources that are directly associated with a transaction. RDT also focuses on the extent to which a resource is embedded in the firm's existing context. According to RDT, both transaction and management costs faced by a firm are dependent on the firm's capabilities [134].

The RDT-based view of competitive advantage examines the link between a firm's internal characteristics and performance. Not all firm resources hold the potential of sustained competitive advantage. A firm's resource must have four attributes: (a) it must be valuable, in the sense that it exploits opportunities or neutralizes threats, (b) it must be rare when considering a firm's current and potential competition, (c) it must be imperfectly imitable, and (d) there cannot be strategically equivalent substitutes for this resource that are valuable but neither rare or imperfectly imitable [9, 58]. Unexpected changes in the economic structure of an industry may transform a source of sustained competitive advantage into one which is no longer valuable for a firm, and thus not a source of any competitive advantage. Resources couched in complex social phenomena may be imperfectly imitable because they are beyond the ability of firms to systematically manage and influence. An information system deeply engrained into a firm's

formal and informal decision-making process is such a socially complex system and thus may hold the potential of sustained competitive advantage [9].

Alliances are one method firms use to access valuable resources they do not already own [30]. They are more likely to form when both firms are vulnerable strategically or when they are in strong social positions [53]. By using strategic alliances a firm can access strategic capabilities by linking with a partner possessing complementary resources or by pooling internal resources with a partner possessing similar capabilities; these alliances create synergies that enhance or reshape market competition. The characteristics of resources, like imperfect mobility, inimitability, and non-substitutability can accentuate value-creation and encourage the formation of alliances. While TCE emphasizes the ability of the partner to capture the benefits from the alliance and to prevent opportunism, the RDT view highlights the establishment of a lasting relationship for resource sharing that serves the strategic purpose of both partners [30]. RDT identifies dependence and uncertainty as key antecedent motivators for establishing interfirm relationships [70]. The commitment of resources and the integration of organizations are integral components of strategic alliances, where a high degree of resource interdependency precipitates non-equity based alliances [29]. For an alliance to remain an effective option, effective safeguards against the risk of opportunism must exist. Interfirm trust, built up gradually as firms repeatedly interact, is an organizational resource that can alleviate these opportunistic hazards [134].

From a RDT view it can be argued that interorganizational relationships characterize political situations in which resource scarcity and dependence could result in coercion over the firms that possess scarce resources [109]. However, not all dependence-based relations are asymmetric; long-term interests and deferred gratification can result in a balance of power

between partners [103]. Research has shown two kinds of resource-sharing exists: an exchange alliance has one partner offering a resource in exchange for another resource from the counterpart; an integration alliance has both partners pooling their resources for a common purpose. Exchange alliances focus on core competencies and outsource activities of secondary importance; integration alliances, on the other hand, can realize synergies from the resource pooling [30].

In essence, a strategic alliance is the creation of a formal and lasting relationship between partners facilitating the ongoing exchange of resources. Strategic alliance creation requires a commitment to investing in relation-specific assets having the potential of collectively increasing the competitiveness of alliance partners through lower total value-chain costs, greater product differentiation, fewer defects and faster product development cycles [29]. These investments can also increase mutual dependency among partners and, hence, the vulnerability of these partners [51]; generally the partner with the greater bargaining power in the alliance gets a greater share of generated rents [29]. In other words, large, strong firms form strategic alliances with small and weak firms because they hold power to obtain greater shares of relational rents and potentially enhance their bargaining power in the entire value network. The smaller, weaker firms in these asymmetric alliances may be compensated with improved reputations and positions in other relationships, exploitation of the larger partner's resources without threatening their market position, and a significantly lower resource commitment to the relationship with minor opportunistic risk to their larger counterparts [29, 30].

Small firms with inherently limited debt capacity, few retained earnings, and capital market disadvantages, can overcome these limitations if they have access to IT investment resources and capabilities [99]. Processes that assimilate and use information in a superior

manner can potentially create sustainable competitive advantage. Strategically aligned IT is such a process [84]; it is unique to a firm and combines business and IT knowledge to support business objectives [116]. Research shows that alignment between IT plans and business plans are significantly related to the use of IT for competitive advantage. RDT is important to our understanding of strategic IT alignment because it provides an understanding of how knowledge sharing can uncover IT-based opportunities and produce superior strategies [84]. Most research in strategic IT has focused on the ability of IT to add economic value to a firm by either reducing a firm's costs or differentiating its products or services [8, 113]. Generally, a firm may use its IT resources to help implement a wide range of strategies, including cost leadership, product differentiation, strategic alliance strategies, diversification strategies, and vertical integration strategies [99].

Therefore, RDT accentuates that it is vital to explore the buildup of IT resources over time and examine how the business environmental conditions would alter the effect of IT; such time-related changes to resources have not been adequately examined in the research literature.

#### 2.4 Relational Exchange Theory

A central theme of the Relational Exchange Theory (RET) is that most exchanges are based on social components [94]. The nature of the exchange relationship may be affected by economic factors and is highly dependent on the behaviors of the exchange partners [4]. The more relational the exchanges become, the more the partners increasingly view the relationship as dependent on an ongoing, mutual dependency with more cooperative interactions and individual partner actions designed to enhance both parties' performance [71]. The more committed the partners are to the relationship, the more willingly they exert efforts to maintain

the relationship's long-term health [4, 138]. Thus RET concerns itself with long-term value exchanges and long-term relationships [125].

It goes beyond the basic notions of customer satisfaction and retention by ensuring the integration of buyer and seller, achieved through linkages at various levels. It constrains the behavior of buyer and seller through developed trust and commitment between the two parties. Since all customers are not equal, it is tactically impossible and strategically ill-advised to forge long-term relationships with all. RET holds that over time, exchange participants are expected to form complex, personal, non-economic gains and to communicate through social exchanges. These relational exchanges are noted by large investments by parties, high switching costs, and extended durations [125].

Relational partners are enmeshed in a complex network of operational and social interdependence where organizational boundaries blur as a result of converging goals [125, 135]. The increase in interdependence increases the importance of careful application of power in the exchange [47]. Conflicts of interest and future trouble are counterbalanced by trust, efforts towards unity maintenance, planning, and implicit/explicit assumptions. There is a significant focus on the process of exchange with detailed planning for future exchange within new environments and changing goals; in addition, there is much attention paid to measuring, specifying, and quantifying all aspects of performance which is likely to include aspects of benefit sharing and adjustments to benefits. Therefore, the range and depth of the mutual dependence increases and hence results in reduced uncertainty, more managed dependence, increased exchange efficiencies, and greater social satisfactions from the relationship; thus goal congruence and cooperation leads to interactions beyond those initially required [47].

Depending upon a set of contextual factors surrounding the exchange, customers may choose a relational orientation with suppliers in some cases and a more transactional orientation in others. From a customer perspective, the impetus to form a relationship with a supplier may be motivated by the desire to block access to key supplier resources by new entrants or to lock in supplier capacity. From the supplier perspective, a close and lasting relationship with customers may empower sellers to exercise indirect control over potential competitors by barring entry into particular markets. Also, the nature of the business can promote the development of relational exchanges such that the highest levels of efficiencies are realized with limited or sole suppliers [125]. Relational-exchange elements and offsetting investments have been shown to be positively related to performance. Manufacturers have dramatically changed their interactions with suppliers, realizing that buyer-supplier relationships are a key component of competitive success [4]. As the relational elements of collaboration and commitment become more prevalent, cooperation will replace competition as the norm, opportunistic behavior will decline, and relationship adaptability will increase [81, 83]. These changes in behavior will result in lower costs, more reliable deliveries, and increased satisfaction with the exchange. Thus the relational elements increase buyer-supplier performance [4].

RET recognizes the long-term nature of relationship development. Therefore, this thesis examines a five-year period in which changes to trust over that period affect transaction costs. This coverage of changes over an entire time period is notably different from most longitudinal studies that measure conditions at two separate points in time; the difference results in a greater quality of causation assessment.

## 2.5 Summary

A successful alliance may rest on two basic premises: establishment of a mutually beneficial relationship, made possible through the favorable calculation of discounted future payoffs from mutual cooperation and the culmination of that cooperation in the commitment of some significant non-recoverable investments by both parties which alleviate the fear of opportunism as the partners build a cooperative history and mutual trust develops between them [108].

The establishment of structured mechanisms providing real-time information and accurate feedback regarding each other's actions will minimize misperceptions, enhance behavioral transparency, and strengthen cooperation [108]. The eventual viability and success of the alliance may depend on the ability of partners to observe and respect informal obligations of the relationship and to modify the alliance for continued value creation [144]. Research shows strong support that high behavioral transparency, long time horizons, and frequent interactions promote reciprocal cooperation. IT can provide the reliable, prompt, and relatively low-cost information that can enhance alliance performance in a wide variety of contractual relations [108].

## 2.6 Previous Research and Study Motivation

Prior research of interest included studies on the differences between various governance strategies, the evolution and advantages of relational governance, the role of IT in relational governance, and the issues, challenges, and potential of small and medium enterprises.

Most of the research examined was limited in scope; i.e. most studies were cross-sectional and variance studies, measuring single points in time to identify factors. The motivation for this thesis was to look at change dynamics in an attempt to understand how relational governance changes things, rather than limiting the thesis to what has changed. To accomplish this examination of dynamic changes, a longitudinal approach was most suited. The prior research is also deficient in longitudinal studies that holistically examine governance dynamics, especially for small and medium enterprises.

General studies of governance concern either the contingent nature of governance selection or the interactiveness of the governance method and managerial decisions. Argyres and Liebeskind [2] posit the concept of governance inseparability—a firm’s past governance choices influence the range and types of governance adoption in the future; thus limiting governance switching and constraining governance differentiation within the firm. Governance influences the performance of a value chains by affecting transaction costs, the level of relational investments, and the strategic use of information [49].

### ***2.6.1. Market versus Hierarchy***

For many years business leaders have seen their options for governing the interactions with other businesses as a dichotomy, market based or hierarchy. Market-based transactions are noted by high task programmability, high output measurability, low asset specificity, and many potential parties. In hierarchical transactions there is high task programmability, high output measurability, moderate asset specificity, low to medium transaction repetition, known future contingencies, medium to high market risks, and contractual rules influenced by institutional factors. Market-based control characteristics include competitive bidding, lack of detailed contracting, and the presence of links between market prices and standardized activities.

Hierarchical control mechanisms include rigid performance targets, detailed rules of behavior, detailed contracts, comprehensive selection criteria with formal bidding, and hostage arrangements. Market-based transactions are noted by low production costs and high coordination. Hierarchical transactions exhibit high production costs and low coordination costs [96]. Market exchanges cannot motivate intermediaries sufficiently to make market learning and market responses fast and efficient. Hierarchical exchanges also slows market responses due to stipulations for careful problem definition and detailed evaluation of decision alternatives [92].

Both market and hierarchy-based governances have advantages and disadvantages that limit the ability of a modern business to operate effectively and assure strategic advantage. The solution was to incorporate the best of both governance approaches into a third approach that Clemons et al. [33] called a “move to the middle” which relies on building and maintaining trust-based, interfirm alliances. In trust-based transactions there is low task programmability, low output measurability, high asset specificity, low transaction repetition, unknown future contingencies, high market risks, social embeddedness, and relationships influenced by institutional factors. In market-based situations, trust is not relevant since switching costs are low. The role of trust in hierarchical situations involves circumstances when human knowledge and skills are important to the quality of the work. In trust-based relationships, formal control mechanisms are minimal to non-existent; instead, control is achieved by developing goodwill and contractual trust to limit opportunistic behavior and information asymmetry. According to Dyer and Singh [52] relational rents are possible when partners combine, exchange, or invest in idiosyncratic assets, knowledge, and resource/capabilities, and/or they employ effective governance mechanisms that lower transaction costs or permit the realization of rents through the synergistic combination of assets, knowledge or capabilities.

Dyer's [49] research found that alliances are preferable to hierarchy in a world of increasing technological uncertainty, especially where the final product is complex and there is heavy interdependence between buyers and suppliers. Alliances can accomplish all the economic benefits attributable to hierarchies provided opportunism is controlled through appropriate mechanisms. Bensaou [13] argues that the paradigm of the vertically integrated firm has reached its limits and is being replaced by leveraged interdependencies and relationships that includes integrated information systems. Market-based paradigms have also been shown to be ineffectual due to the synergistic benefits of alliances. Business-to-business marketplaces were not successful due primarily to supplier issues which include asset specificity, technology adoption, and partnerships/relationships [55].

Therefore, the development of relationalism in customer-supplier dyads is central to the success for many modern businesses. However, relationships are not spontaneously formed, they evolve over a period of time; that evolution deserves to be studied over enough time to sufficiently capture the inherent dynamics. Likewise, relationalism is a hybrid governance that springs from antecedent transactional environments such as market exchange, supplier dominance, or customer dominance; the influences of these environments must be considered in studying the development of dyadic relationships. These concerns are primary motivators for this thesis to consider the transaction environment and the changes over time in trust buildup when examining the causal paths to reduced transaction costs.

### ***2.6.2. Relational Governance***

By developing relationships a firm can tap into others' assets, reduce financial risk, break into new markets quickly, and stay responsive to technological and market shifts. A broad knowledge of buyer and supplier capabilities enables a firm to quickly tailor the entire supply

chain to accommodate market dynamics. This flexibility demands an information architecture that supplies full transparency to buyer and supplier [67]. Poppo and Zenger [112] state that relational governance may function to mitigate the precise exchange hazards targeted by formal contracts—hazards associated with exchange-specific asset investments, difficult performance measurement, and uncertainty.

With time, the development of relational capability allows firms to lower exchange costs, optimize the governance structure choice, and internalize specialized knowledge across the interorganizational network [93]. Hite and Hesterly [72] posit that growth requires a firm to undergo an evolution of networks from socially embedded ties to a balance of embedded and arm's length relations; from cohesion emphasized networks to networks that exploit structural holes; and from path-dependent to more intentionally managed networks. One aspect of intentional management of networks is a deliberate selection of a few suppliers for the development of a long-term relationship. Fewer relationships allow the firm and the supplier to invest in resources allocated to the relationship and thus the supplier can become a core supplier that could derive above-normal rents. The pervasiveness and flexibility of IT allows suppliers to dramatically increase the potential strategies they could use to increase the coordination costs of the customer [62]. Buyers could selectively choose customers as well, develop long-term relationships that require asset investments sufficient to deter switching, and extract above-normal rents. Therefore, a control mechanism for the prevention of opportunistic behavior is essential to the longevity and market performance of the alliance.

Zaheer et al. found that trust plays a substantive role in business-to-business relationships, revealing a direct link between interorganizational trust and performance [145]. Many studies have viewed trust as a mechanism to mitigate the risk and/or the effects of

opportunistic behavior in various economic transactions [14], [40], [56], [63], [79], [104], [105], [118], [119], [146]. Trust moderates the effects of other determinants by serving as the foundation for cooperation, higher performance, positive attitudes, and positive perceptions [44]. Brown et al. [22] studied the hotel industry and found that effective relational exchange with channel partners, by itself or coupled with other governance mechanisms, effectively limited opportunism. Monczka et al. [102] found that partnership success is significantly related to trust, coordination, interdependence, information quality, information sharing, and joint problem solving. Bhattacharjee's research into the role of trust in e-commerce transactions found that trust explains 13 percent of the user's willingness to transact and 19 percent of trust is explained by familiarity with the trustee [20]. Dyer and Singh's [52] results reveal that governance mechanisms based on trust or reputation can lower transaction costs or provide incentives for value-creation initiatives, such as investing in relation-specific assets, sharing knowledge, or combining complementary strategic resources. Lower levels of trust are related to suspiciousness of the information and a higher acceptance of the information relates to higher levels of trust [44]. With higher levels of trust in an alliance, the partners are more prone to invest assets specific to the relationship such as personnel training, co-located facilities, manufacturing or marketing processes, research and development of new and existing products, and actual production equipment. The longer a buyer-supplier link endures, the more the asset specificity between them leads to efficient knowledge transfers relative to other potential partners [88].

Bilateral idiosyncratic investments are able to enhance all performance outcomes and extend the life of the relationship [78]. Poppo and Zenger [112] found that asset specificity leads to greater levels of relational governance. Allen and Gale [1] assert that extending the relationship's scope and increasing invested assets will make the relationship more valuable.

When both parties have significant and specific assets at stake, they will strive to keep the relationship going, thus serving to lock the partners into the relationship by virtue of the relative importance of the contributed assets [144]. Although it has been argued that all interfirm relationships are based on interpersonal interactions between members of two or more firms, interpersonal relationships between buyers and suppliers have been shown to be less of a switching barrier than firm-level switching costs [138] thus suggesting that firm-level relationships are more contributive to alliance perpetuation than individual-level relationships are. Das and Teng [39] studied the multi-partied partnerships called constellations and found that the areas of difficulty in management are trust building, conflict resolution, and coordination; these areas can be addressed by the social control mechanisms of reciprocity, social sanctions, and macro-culture development.

Das and Teng [40] argue that alliances will be preferred when the transaction costs associated with an exchange are intermediate and not high enough to justify vertical integration. According to Trienekens and Beulens, [133] relational governance is noted by transactions with high frequency, high asset specificity and high uncertainty that lead to more long-term relationships containing loosely integrated systems. These relationships are assisted by IT to provide the coordination and scale of large firms and the flexibility, creativity, and low overhead of small firms [80].

The roles of IT and trust are therefore essential to the success of an alliance relationship. These roles are not static but dynamically develop over time in response to internal and external stimuli. The stimuli of interest in this thesis are the transaction costs and the transactional environment. The buildup of IT and trust are managerial-level decisions that impact the relational nature of the customer-supplier dyad and thus reduce transactional costs measured over

time. Variance studies that capture single points in time in cross-sectional studies cannot adequately capture these dynamic changes and hence cannot firmly state causal inferences.

### ***2.6.3. Role of Information Technology***

Chan et al. [27] found that firm performance is positively related to the alignment of IT and strategic business objectives. Information systems shared by two or more companies will significantly contribute to enhanced productivity, flexibility, and competitiveness. Interorganizational information systems can radically change the balance of power in buyer-supplier relationships, provide entry and exit barriers in industry segments, and shift the competitive position of intra-industry competitors [26]. Research on interorganizational systems have long recognized their strategic potential and strength [89]. Porter's seminal work states that technology affects competition by altering industry structure, support cost and differentiation strategies, and spawn entirely new businesses. IT can alter the five competitive forces and the industry attractiveness. IT can also affect the structure of many industries, creating the need and opportunity for change [113]. The study by Clemons et al. [33] argued that IT has the ability to lower coordination costs without increasing the associated transactions risk, leading to more outsourcing and less vertically integrated firms. Clemons and Row [34] suggest that IT decouples an investment's beneficial impact on coordination costs from the damaging impact on its transaction cost, thus allowing firms to move towards the establishment of long-term, stable partnerships and increase resource utilization through greater coordination. Interorganizational systems can offer unique information and service features that can have high perceived value; this value, combined with idiosyncratic interfaces, will greatly increase switching costs [6] and thus contribute to competitive advantage.

IT reduces transaction costs, reduces perceived complexity of products, reduces asset specificity, and increases free information flows [62]. Bharadwaj found that firms with high IT capability tend to outperform a control sample of firms on a variety of profit and cost-based performance measures, but it is how firms leverage their investments to create unique IT resources and skills that determine a firm's overall effectiveness. For instance, interorganizational IT infrastructures enable firms to identify and develop key applications rapidly, share information across products, services and location; implement common TPS and SCM across businesses; and exploit opportunities for synergy across business units. Highly effective IT users also tend to pay attention to intangible benefits of IT: improved customer service, enhanced product quality, increased market responsiveness; and better coordination of buyers and suppliers. Thus, the firm's IT, logistics, and distribution systems, combined with a strong customer orientation, creates a set of complementary resources not easily matched by rivals [17]. IT is valuable, but the extent and dimensions are dependent upon internal and external factors, including complementary organizational resources of the firm and its trading partners, as well as the competitive and macro environment. A high degree of complexity leads to a context-contingent, synergistic combination of IT and other organizational resources including workplace practices, change initiatives, organizational structure, and financial condition. Under conditions of sufficient rarity and non-substitutability, the more difficult they are to imitate, the more likely is the attainment of a sustainable competitive advantage. Trading partners play a critical role in shaping the generation and determining the capture of firm IT business value when they are electronically linked [100].

The role of IT in impacting transaction costs has been cursively explored in the literature and only in cross-sectional analyses. There has been no longitudinal examination how IT directly

impacts transaction costs over time. Again, time is a crucial element of understanding the causal dynamics resulting in reduced transaction costs. Most of the existing research does not account for the moderating effects of the overall business environment.

Studies of the impact of IT on transaction costs are typically lacking in empirical evidence; others, such as Grover et al. [63], find empirically weak direct impacts. This thesis proposes that the major failure of such studies is the lack of a longitudinal examination. Transaction costs are both motivations for investing in IT and also the results of IT investments. High transaction costs will stimulate a firm to automate production and coordination costs [96]; such automation will require extensive investment in IT applications. These IT-enabled automations will lower the transaction costs, but at a later time. Hence, the element of time cannot be dismissed in evaluating both IT buildup and its impact on transaction costs.

#### ***2.6.4. Small and Medium Enterprises***

Firm size is determined by the costs associated with acquiring, storing, processing and disseminating information. The determination of vertical firm size is a tradeoff between market transaction costs (favoring vertically large firm) and the sum of internal coordination costs and operations costs. Horizontal firm size is also determined by the tradeoff between operations costs, external coordination costs, and internal coordination costs [65].

Gupta and Capen [64] found that large, medium, and small firms all have equal success in reducing operational costs, reducing product life cycle, increasing additional value, and enhancing the competitive and financial position of the company. Dollinger [45] studied financial performance characteristics of small firms and found a positive relationship between organizational effectiveness and innovativeness, teamwork, owner authority, formal goal setting, and the number of cross-organizational boundary contacts. Winger [141] contends that the

acceleration in innovative activity has created a need for more inputs from a production factor that needs organizational flexibility and freedom to take risks, needs best satisfied in smaller, less hierarchical firms. Delone [42] summarized the main differences between small and large business; namely, small business must deal with a shortage of management personnel, with financial limitation, and with insufficient external information. According to Chang and Powell [28], most small businesses do not have the resources or the people to create rigid, hierarchical enterprises based around distinct functions; they tend to exhibit more informal communications and a less bureaucratic mode of operation. SMEs are steeped in simple and flexible organizational structures, team-based orientations, easier communications, and closer contacts with customers and suppliers. Effectiveness comes from leveraging intellect and knowledge rather than economies of scale in operations or physical sources of advantages [136].

Hitt [73] stated in 2001 that the economy is transitioning from an era of the large, vertically integrated enterprise to organizational forms drawing on the resources of small, independent, specialist suppliers. The trend is toward greater employment opportunities in smaller companies, fewer permanent or guaranteed jobs, more work done at remote locations, greater reliance on contract workers, and greater utilization of teams [136].

Rogers' [120] research into innovation revealed a positive association between networking and innovation in small manufacturing firms. Business webs consisting of suppliers, distributors, service providers, infrastructure providers, and customers using the internet for communications and transactions, are proving to be more innovative, cost-efficient, and profitable than vertically integrated companies. With the internet, business functions and large projects can be reduced to smaller components and parceled out to more specialized companies with virtually no transaction costs [131]. There are four advantages from an internet presence:

enhanced distribution of information, improved information accessibility, improved communication, increased speed with which the company accomplished tasks. Disadvantages include high costs of setup and maintenance, reduction of personal contact with customers, lack of security over important information, and the possibility of competitors accessing technical information. Small businesses are not concerned with exposure of technical information to competitors or the limitation of personal contact with customers. The majority of small businesses believe that an internet presence allows a small business to keep pace or push ahead of competition [117].

The level of IT investment is positively related to the degree of firm diversification; the relatively greater need for coordination by diversified firms calls for higher IT investment. Diversification increases the need for coordination of assets across multiple lines of business and therefore increases the demand for IT. Therefore, firms less vertically integrated have a higher level of IT investment [43]. The research of Hussin et al. [75] accentuated the need for research to examine the processes associated with IT alignment in small firms.

Wang posits that IT-enabled organizational migration moves through knowledge link, transaction link, and then business alliance link after interorganizational networks become a strategic necessity [137]. Although large firms are more likely to invest in advanced technologies than small firms, Gupta and Capen [64] found no difference between large and small firms in the ability to successfully deploy IT to achieve organizational goals or in the extent to which IT supports various functional tasks such as strategic planning, shop automation, process controls, process improvements, quality control, and engineering. IT is equally successful in cutting operational costs, reducing product life cycle, increasing value, and enhancing competitive and financial position of both the large and the small firm [64].

IT has altered the information environment; information flows are more personal, reflect more distributed patterns of organizational control, foster innovativeness and creativity, and engender more widespread patterns of collaborative work. The major contributions of IT are improved efficiency through speed of processes and service quality, organizational boundary spanning, and coordination of relations among organizational units [137]. IT moderates the relationship between strategic business drivers and firm performance [18]. IT capability is not so much a specific set of sophisticated technological functionality as it is an enterprise-wide capability to leverage technology to differentiate from competition [19]. Even at a country level, a greater investment in IT is associated with greater productivity growth. IT is not simply a tool for automating existing processes but is more importantly an enabler of organizational changes leading to additional productivity gains. Complementary management practices such as decentralization of decision making, business process redesign, and total quality management are also important [41].

IT is also instrumental in changing the skills and attitudes of the labor force itself. For instance, managers or owners more receptive to adopting e-commerce possess the financial and technological resources to implement it, see e-commerce as increasing managerial productivity and supporting strategic decisions, feel external pressure to put e-commerce into operation, perceive e-commerce as compatible with preferred work practices and existing technology infrastructure, and perceive e-commerce as useful for their firms. This change is applicable to both large and small firms; the adoption of EDI by small business is significantly affected by perceived benefits, organizational readiness, and external pressures [59].

Similarly, strategic value in IT is created through operational support, managerial productivity, and strategic decision aids [59]. IT has a strong positive relationship with sales,

assets, and equity, but not with net income; spending on IT staff and staff training is positively correlated with firm performance, even more so than computer capital. IT investments such as computer capital, MIS staff, MIS staff training, and non-IT investments such as labor and non-computer capital, are directly related to all firm performance indices [126]. In Bensaou's 1998 work [15], he pointed out some insightful differences between Western and Japanese approaches to strategic IT.

In the West, IT strategy is developed that aligns with business goals; in Japan it is the basic competitive method used that drive IT investments. The West assumes that technology offers the smartest and cheapest way to improve performance; the Japanese, in contrast, identify a performance goal and then select the technology best suited to support the people doing the work. The Western approach is to teach specialists about business goals, and then develop technically adept, business savvy CIOs; the Japanese way is to integrate managers through the IT function by co-locating specialists and users. The West designs the most technically elegant system possible and then asks employees to adapt; the Japanese design systems to maximize the use of the tacit and explicit knowledge already possessed by the employees. Finally, the West adapts capital budgeting processes to manage and evaluate IT investments; but the Japanese evaluate IT investments in light of improved operational performances [15].

A similar dichotomy can be drawn between large and small firms, with large firms typifying the Western approach and small firms resembling the Japanese way. Since small firms typically have business goals but due to dynamic nature of their business and the resultant focus on daily operational issues, they do not have specific IT strategies; therefore, it is their competitive method that drives IT investments, usually on an ad hoc basis. Also, since for small firms the people making the IT investment decisions are the same people who do the work; the

technology selected is the one that best supports both the performance goals and the people doing the work. In the same vein, the managers and specialists in a small firm are already co-located and hence the integration in the IT function is a natural process. Like the Japanese, the small firm is keenly aware of the tacit and explicit knowledge content of all employees and is therefore prone to select technology that accommodates and enhances that knowledge. Finally, small firms are more performance driven than large firms and, like the Japanese, they are more inclined to evaluate the outcomes of IT investments in terms of performance improvements.

Since SMEs have limited budgets, they more carefully select IT investments and evaluate those investments in terms of performance improvements; therefore, the buildup of IT in SME suppliers should readily demonstrate direct impacts on transaction costs. Prior research has found weak support for the impact or simply have not empirically assessed the impact. This thesis is the first to longitudinally assess the direct impact; SMEs were chosen because the impact should be more discernible.

## CHAPTER 3

### RESEARCH MODEL AND HYPOTHESES

#### 3.1 Research Model

The research model below was designed to be as parsimonious in constructs as possible and yet still retain the richness of a process study and make contributions to important research questions.

The model stems from an examination of many cross-sectional models concerning transaction costs, relationalism, and trust that were subsequently subjected to iterative expansions to include a longitudinal aspect and then iteratively contracted and condensed to achieve parsimony. The principal influence on the final model comes from the 2003 study by Claro et al. on the determinants of relational governance and performance [32]. Other influential studies are Grover et al.'s 2002 study of IT in building buyer-supplier relationships [63], Grover and Malhotra's 2003 study of transaction cost framework [61], Dahlstrom and Nygaard's 1999 study of ex post transaction costs [38], Sanders and Premus' 2005 model of the relationship between IT capability and firm performance [121], Dyer's 1997 model of interfirm collaboration [50], and Poppo and Zenger's 2002 study of contracts and relational governance [112].

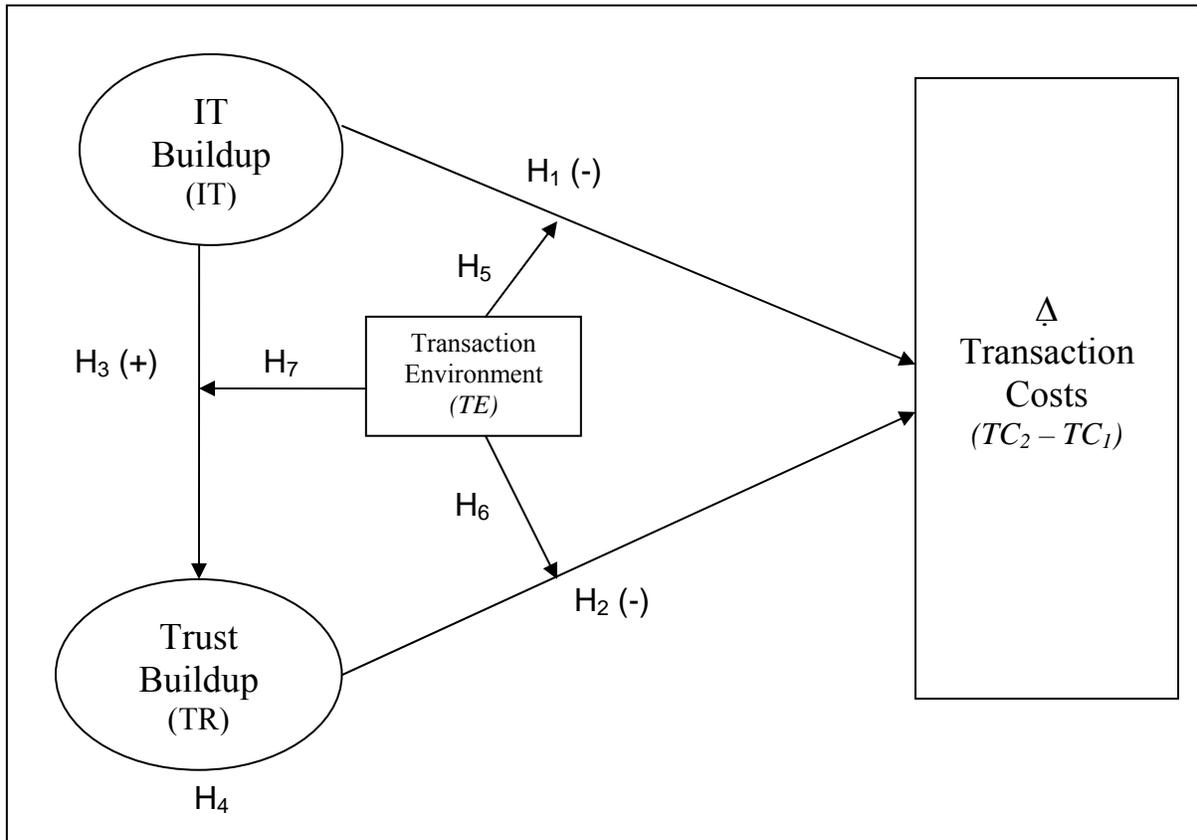


Figure 3.1 Research Model

The model addresses the research questions by hypothesizing that the buildup of adaptive efforts (IT and trust) over time reduces the transaction costs of the SME supplier, thus increasing their survivability. The model indicates that the role of IT and trust are significant in these adaptive efforts and are negatively related to the changes in transaction costs. The influence of the levels of transaction costs and the expected outcome on transaction costs are noted in the model by the inclusion of the changes in transaction costs as the difference between the initial and the post measurements. The direct impact of IT on transaction costs is noted in the model by the hypothesized negative relationship between IT buildup and changes in transaction costs. The effect of the environmental conditions is included in the model as the transactional environment (TE) moderator and three hypothesized conditions are noted. Changes in IT affect not only

transaction costs but also levels of trust; thus trust can have a mediating effect on the relationship between IT and transaction costs and this role is reflected in the model. Thus the model parsimoniously addresses not only the relationships between IT, trust, transactional environments, and transactions costs but also includes a longitudinal aspect by expressing the relationships in terms of changes over time.

### ***3.1.1. Construct Measures***

Transaction costs are measured for two time intervals, five years ago and now, each measured on a seven-point Likert scale. IT buildup and trust buildup are likewise measured on a seven-point scale with an added dichotomous question to designate either increased or decreased, thus preserving seven points of response granularity in either direction. Therefore, IT buildup and trust buildup are direct measures of changes that have occurred over the five year period. Transaction environment is a three-question, mutually exclusive selection that designates whether the firm has operated for the past five years in a market-based, customer-dominated, or supplier-dominated environment.

The transaction environment questions are based on Bensaou's framework of contextual profiles in his 1999 examination of buyer-supplier relationships [14]. The questions on trust buildup are taken from Doney and Cannon's 1997 study of trust in buyer-seller relationships [46]. The questions concerning transaction costs are taken from Piling et al.'s 1994 experimental test of the TCE framework [111]. The questions for the IT buildup were adapted from a 1995 study of interorganizational factors by Premkumar and Ramamurthy [114]. In addition to these questions, the respondents were asked demographic information such as industrial classification, sales volume, number of customers, and job title. Also, four open-ended questions concerning relationship improvement were included.

### ***3.1.2. Research Hypotheses***

Sanders and Premus' 2005 study contacted large US manufacturers and found support for the hypothesized positive relationships between IT capability, internal collaboration, external collaboration, and firm performance [121]. Dahlstrom and Nygaard [38] studied Norwegian oil producers and the relationships between control structures (interfirm cooperation and formalization), opportunism, and transaction costs (bargaining costs, monitoring costs, and maladaptation costs); they found support for a hypothesized negative relationship between formalization and opportunism, and positive support between opportunism and each element of transaction costs. In addition they found "lingering" effects of these relationships over a five-year period. Grover and Malhotra's 2003 study surveyed electronic manufacturers to examine propositions concerning the relative relationships between transaction costs and second-order factors (effort, monitor, problem, and advantage) [61]. Grover et al. surveyed purchasing managers; they found that transaction costs are negatively related to relationalism and that IT positively mediates that relationship [63]. Poppo and Zenger's 2002 study surveyed Fortune 500 executives and found that exchange hazards are positively related to contract complexity, IT size is positively related to contract complexity, and that both relational governance and customized contracts can act as either complements or substitutes for exchange performance [112]. Dyer surveyed US and Japanese automakers and found, among other things, a positive relationship between investments in relation-specific assets and joint performance and also a negative relationship between transaction costs and joint performance [50]. Claro et al. surveyed Dutch flower growers and learned that two transactional elements (exchange mode and physical transaction specific investment) plus one business environment element (network intensity) and

one dyadic level element (interorganizational trust) are all correlated with one element of relational governance (joint planning); interorganizational trust and interpersonal trust were also found to be correlated with the other element of relational governance (joint problem solving) [32].

Table 3.1 below summarizes an examination of the contributing studies to the research hypotheses. These seven studies accentuate a research gap and also provide a motivation for the current study.

Table 3.1 Contributing Studies Synopsis

Study	Time reference	Transaction Costs	Transactional Environment	Trust	IT	Dyadic reference
<i>Sanders and Premus, 2005</i>	Cross-sectional	No	No	No	Yes	Customer
<i>Dahlstrom and Nygaard, 1999</i>	Cross-sectional (partially longitudinal)	Yes	No	No	No	Customer
<i>Grover and Malhotra, 2003</i>	Cross-sectional	Yes	No	No	No	Customer
<i>Grover et al., 2002</i>	Cross-sectional	Yes	No	Yes	Yes	Customer
<i>Poppo and Zenger, 2002</i>	Cross-sectional	No	Yes	Yes	Yes	Customer
<i>Dyer, 1997</i>	Cross-sectional	Yes	No	No	No	Customer
<i>Claro et al., 2003</i>	Cross-sectional	Yes	Yes	Yes	No	Supplier

All seven of these studies are either firm-size indifferent or focused on large enterprises. Only one of the studies (Dahlstrom and Nygaard) has any longitudinal quality and it only slightly so; all the others are cross-sectional studies. Five of the seven involve transaction costs but only one of these five also involves IT. In fact, only three studies involved IT at all. Trust was a component in three of the studies, and only two studies involved the transaction (business) environment. All but one study (Claro et al.) was conducted from the perspective of the customer, rather than the supplier. There were two studies (Grover et al., Popper and Zenger)

that involved three of the elements in the current study; both studied trust and IT but Grover et al. included transaction costs and omitted transactional environment while Poppo and Zenger included transactional environment but excluded transaction costs.

The only study of the above seven to examine the relation between IT and transaction costs was the cross-sectional study by Grover et al. [63]. That study found a weak (.15), positive relationship between IT and transaction costs. However, theories, such as TCE, suggest that IT can lower transaction costs; studies such as Clemons et al. [33] have utilized this theoretical relationship but have not empirically tested it. This apparent incongruity with theory can be explained by examining the longitudinal aspects of transaction costs. If transaction costs are high, firms are likely to increase their IT expenditures to combat the transaction costs by, for instance, automating elements of transactions and thus lower costs. However, the lowered costs are not immediate; they occur over time as more IT applications are brought to bear on more cost situations. At the initial period there is a point in time when transaction costs are high and there is an increase in IT expenditures; hence, at an initial period there is a positive relationship between IT and transaction costs, just as Grover et al. discovered. It is the contention of this thesis that as IT is increased over time, there will be a subsequent drop in transaction costs compared to the initial level of transaction costs; in other words, as IT is increased the difference between the ending and beginning levels of transaction costs will be negative. As IT increases over time, transaction costs will be lower, just as theory predicts. It is the stipulation of time that substantiates the theory. Therefore, the first hypothesis states that increases in IT over time will lower transactions costs over time.

*H<sub>1</sub>: IT Buildup (IT) is negatively related to Changes in Transaction Costs (TC).*

The proponents of SET and RET state that trust is influential in constraining the behavior of partners, limiting their actions to ones that benefit and perpetuate the relationship. Therefore, higher levels of trust, developed over time, should reduce the risk of opportunism by ameliorating or eliminating search, coordination, and monitoring costs, thereby reducing transactions costs over time.

*H<sub>2</sub>: Trust Buildup (TR) is negatively related to Changes in Transaction Costs (TC).*

Information technologies assist partners in information exchange which has been linked in prior research to increases in trust levels. Therefore, higher expenditures for IT should produce higher levels of trust in a buyer-supplier dyad.

*H<sub>3</sub>: IT Buildup (IT) is positively related to Trust Buildup (TR).*

Both IT buildup and trust are hypothesized to impact transaction costs. There is also a hypothesized link between IT and trust. Therefore trust could be a mediator to the relationship between IT and transaction costs.

*H<sub>4</sub>: Trust mediates the link between IT Buildup (IT) and Changes in Transaction Costs (TC).*

Bensaou's [14] framework (see Appendix A) contextually profiles four quadrants of relationships—Market Exchange, Captive Buyer, Captive Supplier, and Strategic Partnership. The first three quadrants are elemental, business environments that exist outside the ability of human intervention. The Strategic Partnership quadrant, however, can only exist after extensive

and deliberate effort by both parties. Therefore, in this thesis the business environment, representing conditions outside the influence of managerial decisions, are represented by market (no dominance), customer-dominate, and supplier-dominate environments. These environments are foundational and pervasive in all managerial decisions affecting relationships between customer and supplier. One can therefore hypothesize the environment(s) where supplier managerial decisions will have the strongest or weakest influence.

In the matter of IT Buildup's impact on Transaction Costs, the total transaction costs will be lower in any dominate environment, either customer or supplier dominate, than in market environment because market transactions are subject to search, monitoring, and controlling costs for every transaction, whereas these costs in the dominate environments are controlled due to limited number of alternatives. The study by Malone [95] states that coordination costs (maintaining communication channels, the costs of message exchange) is higher in market structures than in the more hierarchical forms such as the customer or supplier dominate environments. In the dominate environments alternate buyers or suppliers are few, the search costs are drastically reduced, and the monitoring and controlling costs are also reduced because the party with the lower bargaining power is too dependent on the other party to risk alienation. Therefore, the market environment has the greatest scope and degree of transaction costs that can be subjected to IT-enabled automation and information transparency.

*H<sub>5</sub>: The impact of IT Buildup (IT) on Changes in Transaction Costs (TC) will be strongest in the Market Transaction Environment (TE).*

In customer or supplier-dominate environments, the party with the weaker bargaining position has little choice but to trust the other party to some extent; for instance, a dependent

supplier must have some degree of trust that the customer will continue placing orders in order to procure inventory in anticipation of future business. However, in the market environment the sheer numbers of alternative customers and suppliers precludes any ingrained trust since there is no basis for assuming any future transactions with the same customer or supplier will take place. Therefore, any trust in the market environment will not appreciably lessen search, monitoring, or controlling costs as much as trust in the dominate environments.

*H<sub>6</sub>: The impact of Trust Buildup (TR) on Changes in Transaction Costs (TC) will be weakest in the Market Transaction Environment (TE).*

TCE predicts that firms will be motivated to seek an appropriate governance strategy to lower the costs. If it is possible to develop trust in the business environment, then trust becomes a possible cost-reducing strategy. In the market environment, as stated above, trust is difficult to develop and comparatively ineffectual on transaction costs. In the supplier-dominate environment, the supplier is not inclined to make decisions or investments to develop trust since the customer is already dependent. However, the supplier is the dependent party in the customer-dominate environment and hence is highly motivated to make decisions and investments that could develop trust, bind the parties closer together, and lower the supplier's transaction costs. IT is one such investment to develop trust.

*H<sub>7</sub>: The impact of the IT Buildup (IT) on Trust Buildup (TR) will be strongest in the Customer Dominate Transaction Environment (TE).*

### **3.1.3. Research Methodology**

This thesis selected U.S. manufacturing firms employing 250 employees or less; the unit of analysis is the organization. Other studies involving manufacturers have been done and the

Grover and Malhotra 2003 study [60] synopsis studies of manufacturing that utilized TCE into a table which is included in Appendix B. Specifically, this thesis selected SME manufacturers who are suppliers to large firms (1000 or more employees) and who have established relationships with the large customer for at least five years; also, the large customer should not own the SME or hold a major equity position in the SME. The Small Business Administration states that small business employs 500 or fewer for most industries, including the manufacturing industries [124]. By capping our SME designation at 250 employees, we feel the essence of small business is most preserved (flat hierarchy, cross-functional responsibilities, informal communications, ad hoc problem solving, limited budgetary power) while still allowing sufficient size to expect strategic planning coordination with IT investment decisions. While some studies have designated firms with 1000 employees as a medium enterprise, we feel the differential between 250 employees and 1000 employees is sufficient to assure that the planning, operational controls, bargaining power, and decision-making hierarchy is notably different between the two sizes.

The respondent pool was drawn from the Dynamic Small Business Search ([http://dsbs.sba.gov/pro-net/dsp\\_dsbs.cfm](http://dsbs.sba.gov/pro-net/dsp_dsbs.cfm)). Using the criteria of “250 or less employees” and “manufacturer” yielded over 18,000 email addresses. The SBA office responsible for this database was contacted and it was verified that the addresses are available at no charge. The written questionnaire was subjected to a pilot test using personal interviews with local SME manufacturers. After revisions resulting from the pilot testing, the respondents were invited via email to participate in the study; the email included the URL address of the on-line questionnaire. A reminder email was sent to non-respondents after the initial mailing. Responses were directly recorded in a database for empirical analysis.

Although the questionnaire is using questions that have been validated in one or more other studies, those studies utilized the customer as the respondent. Since we are using the supplier as the respondent, we will assess construct validity and reliability. The data will also be analyzed using Structured Equation Modeling and other techniques.

## CHAPTER 4

### INSTRUMENT DEVELOPMENT

The research model is divided into three broad categories of variables IT Buildup (IT), Trust Buildup (TR), and Changes in Transaction Costs (TC). IT consists of two constructs, Automation and Information Exchange. TC encompasses four constructs, Monitoring, Problem Solving, Advantage Taking, and Effort. Trust has no components. The following section identifies the source and validity of items for each of the constructs.

#### 4.1 Measures of IT Buildup

The first four questions on IT Buildup in Table 4.1 are items adopted from operationlized constructs in a study by Grover et al.[63]; the source for these constructs is a study by Premkumar and Ramamurthy [114] that examined the role of interorganizational and organizational factors on the decision mode for adoption of interorganizational systems. The Grover et al. study investigated the role of IT in building buyer-supplier dyads. The remaining five questions are extensions of these questions to provide finer granularity in this construct.

Table 4.1 Measures of IT Buildup

#	Item	Source	Validity
1	Exchanging information on technical product requirements for Product P.	Grover et al. (2002)	Item to total correlation > 0.30
2	Ordering raw material or components for Product P.	Grover et al. (2002)	Item to total correlation > 0.30
3	Shipping and receiving of Product P's raw material or components.	Grover et al. (2002)	Item to total correlation > 0.30
4	Inventory control for raw material or components for Product P.	Grover et al. (2002)	Item to total correlation > 0.30
5	Exchanging information on finished goods inventory for Product P.		
6	Exchanging information on production schedules for Product P.		
7	Exchanging information on anticipated demand for Product P.		
8	Exchanging information on costs or prices for Product P.		
9	Placement of orders for Product P.		

#### 4.2 Measures of Trust Buildup

The questions on trust buildup have been adopted from a study by Doney and Cannon [46] to investigate the nature of trust in buyer-supplier relationships. Their study included a variable named “Trust of Supplier Firm” comprised of 8 questions; the study states this variable had a Cronbach alpha of .94. We adopted 7 of those questions for our study.

#### 4.3 Measures of Changes in Transaction Costs

The questions on Changes in Transaction Costs were adopted by the study by Grover et al. [63] which based their measures from a study by Piling et al. [111]. The Grover et al. study investigated the role of IT in building buyer-supplier relationships from the buyer's viewpoint. The Piling et al. study examined relational bonds in industrial exchange to test transaction cost economic framework; they also approached their study from the buyer's viewpoint. The Piling et al. study did not disclose individual questions; the study states that factor analysis was used to assess dimensionality and that principal components analysis was applied using eigenvalues

greater than 1.0. The Grover et al. study did include specific question items in their factor analysis. Table 4.2 lists the questions in this thesis that were adapted from the Grover et al. study to fit our perspective of the supplier.

Table 4.2 Measures of Changes in Transaction Costs

#	Item	Source	Validity
1	Both parties clearly understand what this relationship will involve	Adopted from Grover et al. (2002)	Item to total correlation > 0.30
2	It is straightforward and easy to work out the main issue and necessary details of the relationship	Adopted from Grover et al. (2002)	Item to total correlation > 0.30
3	It requires significant effort to determine individual roles to be performed by our firm and Customer C.	Adopted from Grover et al. (2002)	Item to total correlation > 0.30
4	It is easy to tell if we receive fair treatment from Customer C.	Adopted from Grover et al. (2002)	Item to total correlation > 0.30
5	It takes significant effort for Customer C to detect whether or not we conform to specifications and quality standards.	Adopted from Grover et al. (2002)	None stated
6	We are in a good position to evaluate how fairly Customer C deals with us.	Adopted from Grover et al. (2002)	Item to total correlation > 0.30
7	Accurately evaluating Customer C requires a lot of effort.	Adopted from Grover et al. (2002)	Item to total correlation > 0.30
8	There is not much concern about Customer C taking advantage of this relationship.	Adopted from Grover et al. (2002)	Item to total correlation > 0.30
9	It is costly, in time and effort, for Customer C to clearly monitor our performance.	Adopted from Grover et al. (2002)	None stated
10	The approach to solving problems with Customer C is clear-cut.	Adopted from Grover et al. (2002)	Item to total correlation > 0.30
11	There are standard solutions or approaches to problems that might occur with Customer C.	Adopted from Grover et al. (2002)	Item to total correlation > 0.30
12	Problem-solving is often challenging due to the nature of Product P.	Adopted from Grover et al. (2002)	Item to total correlation > 0.30
13	Although solutions to problems can be achieved, they would often need to be highly customized.	Adopted from Grover et al. (2002)	Item to total correlation > 0.30
14	There are no incentives for Customer C to pursue their interests at the expense of our interests.	Adopted from Grover et al. (2002)	None stated
15	It is easy for Customer C to alter the facts to get what they wanted.	Adopted from Grover et al. (2002)	Item to total correlation > 0.30

Table 4.2 - continued

16	There is a strong temptation for Customer C to withhold or distort information for their benefit.	Adopted from Grover et al. (2002)	Item to total correlation > 0.30
17	It is difficult for Customer C to promise to do things and get away without actually doing them later.	Adopted from Grover et al. (2002)	None stated
18	There exists, from Customer C's perspective, a significant motivation to take advantage of unspecified or unenforceable contract terms.	Adopted from Grover et al. (2002)	Item to total correlation > 0.30

#### 4.4 Measures of Transaction Environment

The measures of Transaction Environment required the respondent to select only one of three possible states: Supplier Dominant, Customer Dominant, or Free Market environment. These three states were adopted from a study by Bensaou [14] that detailed four contextual profiles in a 2 X 2 matrix: Captive Buyer, Captive Supplier, Market Exchange, and Strategic Partnership. Bensaou's study was conceptual in nature and did not include any validity assessments.

#### 4.5 Second Order Constructs

Table 4.3 presents the second order constructs used in this thesis; the questions were developed from previously validated instruments.

Table 4.3 Second Order Construct Validity

Construct	Source	Validity
Automate		
Exchange		
Effort	Grover et al. (2002)	Cronbach Alpha 0.70
Monitor	Grover et al. (2002)	Cronbach Alpha 0.87
Problem Solving	Grover et al. (2002)	Cronbach Alpha 0.74
Advantage	Grover et al. (2002)	Cronbach Alpha 0.83

#### 4.6 Summary

This chapter discussed the constructs used in this thesis, their source and their validity. There is strong theoretical foundation for the constructs used. This thesis adopted the items to suit the unique perspective and time focus of this study.

## CHAPTER 5

### DATA COLLECTION AND ANALYSIS

#### 5.1 Survey Technique

The research instrument (Appendix C) is an online survey developed from several instruments which were successfully tested in the past. We adapted those instruments to match our specific needs without distorting their original purpose.

The inexpensive and flexible natures of an online survey are powerful incentives that prompted its selection for this thesis. An email invitation containing a link to the survey was sent to potential respondents; the invitation contained language constituting an introductory letter. After sufficient time had passed and the responses dwindled, a reminder email was sent to non-respondents. All possible efforts were made to protect the privacy of the respondents.

Research has shown online surveys to be at least equal to mailed surveys; Bachmann et al. [5] found that email surveys can be substituted for postal surveys. Coderre [34] compared online surveys to telephone surveys and discovered that the quality of qualitative data of online surveys was comparable to both telephone and mailed surveys. One objection to online surveys versus mailed surveys is the disparity between the rarity of email address in relation to the near ubiquitous quality of physical addresses. Most of the respondents we targeted are small and medium enterprises; we believe the majority of this group possess and use email capabilities.

Online surveys can reduce the expense, effort and amount of time needed for a survey study. The major concerns for using online surveys are privacy, duplication, and spam. All reasonable efforts were taken to separate the responses from any possible identification of respondents; also, no personal questions were asked of respondents that could identify them. The database of respondents had access limited to one person and all files were kept on computers protected by passwords. The responses were examined and duplicate answers were removed before analysis. A number of undeliverable emails due to spam blockers were expected; however, many from this group provided links to circumvent the block and the emails were delivered.

### 5.2 Pilot Survey

A pilot test of the written survey was conducted prior to the conversion to an online survey. The pilot version was tested with 6 volunteer respondents who were demographically similar to the target population. Using their feedback the survey instrument required very minor adjustments for clarity.

### 5.3 Data Collection

The target respondents are manufacturing firms in the continental US with 250 or less employees that have been in business at least 5 years and have a relationship with at least one customer that employs 1000 or more people. The list of respondents was obtained from a SBA website that allowed query-based searches and downloads.

After downloading, cleaning for obvious errors such as web addresses for email addresses, 18,639 potential respondents were obtained and emailed. A total of 1,937 (10.4%)

emails were returned as undeliverable. 318 responses were obtained from the mailings; however, elimination of blank responses yielded a final sample of 301 responses for a response rate of 1.6%. Although not atypical for recent email surveys, this response rate is low for most research standards. Some respondents may have ignored or filtered out the contact email as spam, other respondents may have had privacy concerns about the internet aspect of the survey. Some may have seen the email invitation as a form of phishing; Dr. Teng received several email messages asking for verification of the survey's legitimacy.

#### 5.4 Statistical Technique Selection

Descriptive statistics were used to tabulate and summarize all constructs; also, factor loadings were tested for each construct. Responses were analyzed using descriptive statistics, analysis of variance (ANOVA), t-tests, and PLS (partial least squares) (Gefen et al. [56]). PLS Graph (Version 03.00) was provided courtesy of Wynne Chin, Ph.D. and Sandra Henderson Ph.D.

PLS is a SEM (Structural Equation Modeling) application that assesses both the structural model and the measurement model which enables us to concurrently do factor analysis with hypotheses testing (Marcoulides and Saunders [95]). SEM gives the researcher the freedom to model relationships among variables and conduct confirmatory analysis [31]. PLS supports both formative and reflective measures; LISREL does not map formative variables. IT Buildup and Transaction Costs are formative variables in our model; Trust Buildup is a reflective variable.

## 5.5 Sample Size

Research has suggested varying sample size requirements for PLS. Most have cautioned against too small a sample size (Marcoulides and Saunders [95]). Curran [37] recommended sample sizes of approximately 200 to prevent bias in SEM applications. PLS has been suggested as appropriate even for samples sizes much smaller than 200; PLS also has robustness against assumption violations, such as skewness or multicollinearity [66]. To avoid problems associated with normality deviations, a ratio of 15 respondents to one parameter is considered acceptable [97]. In our study, the 9 parameters would necessitate at least 135 responses; we have over twice that number of responses.

## 5.6 Data Preparation

### ***5.6.1. Outlier Data***

Using univariate techniques and multivariate techniques, 13 potential outliers were identified. Hair et al. [68] suggests a standardized threshold score of 3 for large data sets in conducting univariate analysis. We used both the standardized threshold score and Maholanobis Distance to select potential outliers. The examination of the 13 individual responses could find no abnormality to sufficiently justify exclusion.

### ***5.6.2. Missing Values for Data***

Since we had no way to identify the exact person who responded, there was no way to ask respondents to complete missing values. Cases where all 55 questions were not answered were eliminated as were 4 cases where the respondent only answered the first 2 or 3 preliminary questions. The estimated means of the existing responses per question were used to replace other missing values.

### 5.6.3. Key Informant Bias

We examined informant competency to assess key informant bias as suggested by Straub et al.[128]. The survey questions concerning job title and years of service revealed over half of the respondents have the titles of President, Vice-President, or Manager; and more than half have over 10 years of service, the median is 14 years of service. These results demonstrate job titles and experience sufficient to be representative of their organizations.

### 5.6.4. Non-response Bias

To determine the possibility of non-response bias in the survey data, responses must be tested to detect any statistically significant differences between early versus late returned responses (Armstrong and Overton [3], Lambert and Harrington [88]). Non-response bias was tested by comparing 50 of the first responses (early) and 30 of the last responses (late) on 7 question items randomly selected. None of the selected constructs showed significant results.

Table 5.1 Non-response Bias Items

<b><i>Item: Trust2: Our trust that Customer C is honest with us.</i></b>						
Sample	N	Range	Mean	Variance	T-Stat	Results
Early	50	-7 to 7	1.4000	12.1633	-0.6244	Not significantly different
Late	30	-7 to 7	1.9002	11.8177		
<b><i>Item: Trust3: Our trust in the information Customer C provides us.</i></b>						
Sample	N	Range	Mean	Variance	T-Stat	Results
Early	50	-7 to 7	1.4600	10.7433	-0.6511	Not significantly different
Late	30	-7 to 7	1.9642	12.0973		
<b><i>Item: TC5-8: There is not much concern about Customer C taking advantage of this relationship.</i></b>						
Sample	N	Range	Mean	Variance	T-Stat	Results
Early	50	1 to 7	3.2484	3.5325	-0.8334	Not significantly different
Late	30	1 to 7	3.6000	3.0069		
<b><i>Item: TCN-6: We are in a good position to evaluate how fairly Customer C deals with us.</i></b>						
Sample	N	Range	Mean	Variance	T-Stat	Results
Early	50	1 to 7	2.8223	2.1517	0.1636	Not significantly different
Late	30	1 to 7	2.7704	1.4287		
<b><i>Item: TCN-15: It is easy for Customer C to alter the facts to get what they want.</i></b>						
Sample	N	Range	Mean	Variance	T-Stat	Results
Early	50	1 to 7	3.3391	4.0569	-0.8004	Not significantly different
Late	30	1 to 7	3.7287	5.0969		

Table 5.1 - continued

<b>Item: IT-6: Exchanging information on finished goods inventory for Product P.</b>						
Sample	N	Range	Mean	Variance	T-Stat	Results
Early	50	-7 to 7	3.2400	7.2065	0.8342	Not significantly different
Late	30	-7 to 7	2.7354	6.2726		
<b>Item: IT-8: Exchanging information on cost or prices for Product P.</b>						
Sample	N	Range	Mean	Variance	T-Stat	Results
Early	50	-7 to 7	2.5607	10.4561	0.4524	Not significantly different
Late	30	-7 to 7	2.2333	8.7368		

Comparing the 2005 sales figures between early and late respondents in Table 5.2 reveals no significant difference.

Table 5.2 Analysis of 2005 Sales

	Early	Late	Total
< 1 million	14	15	29
1 – 10 million	29	15	44
11 -100 million	9	5	14
> 100 million	0	1	1
Total	52	36	88
chi-squared Stat			3.8501
df			3
p-value			0.2781
chi-squared Critical			7.8147
Result: Not significantly Different			

Comparing the total number of customers between early and late respondents in Table 5.3 produced no significant difference.

Table 5.3 Analysis of Number of Customers

	Early	Late	Total
< 100	22	21	43
101 – 1000	20	5	25
> 1000	6	3	7
Total	48	29	77
chi-squared Stat			5.6808
df			2
p-value			0.0584
chi-squared Critical			5.9915
Result: Not significantly Different			

Analysis of the number of years of service between the early and late respondent groups also revealed no difference, as reflected in Table 5.4.

Table 5.4 Analysis of Years of Service

	Early	Late	Total
<= 5	10	10	20
6 – 10	14	7	21
11 -120	12	9	21
> 20	13	3	16
Total	49	29	78
chi-squared Stat			4.157
df			3
p-value			0.245
chi-squared Critical			7.8147
Result: Not significantly Different			

The comparison between the annual purchases of Product P between the early and late respondent showed no significant differences as detailed in Table 5.5 below.

Table 5.5 Analysis of Annual Purchases

	Early	Late	Total
<= 100,000	23	7	30
101,000 – 500,000	15	2	17
501,000 – 1 million	4	4	8
> 1 million	6	6	12
Total	48	19	67
chi-squared Stat			7.2876
df			3
p-value			0.0633
chi-squared Critical			7.8147
Result: Not significantly Different			

### 5.7 Sample Respondent Demographics

Ten demographic questions were asked the respondents. Respondents were asked for the number of employees in their organization, the annual sales for 2005, the number of customers for all of their products, if a special relationship exists that greatly restricts participation by other potential customers and suppliers, Customer C's typical annual sales of Product P, if Customer C purchase multiple products in addition to Product P, the respondent's job title, the years of service in the organization by the respondent, and if Customer C is a foreign company. No attempt to replace missing values was made for these questions. There were no positive responses to the question concerning Customer C being a foreign company. The two tables below summarize the rest of the results.

Table 5.6 Respondent Demographics

	<b>Number Employees</b>	<b>2005 Sales</b>	<b>Number Customers</b>	<b>Years Service</b>	<b>Annual Purchases</b>
MIN	1	20,000	1	1	300
MAX	6,000	875,000,000	50,000	58	100,000,000
MEDIAN	13	2,000,000	101	11	250,000
MEAN	74	12,761,131	1,173	14	1,232,901
STD.DEV.	410	72,201,813	4,478	10	6,667,774

Table 5.7 Respondent Demographic Groupings

<b>TITLE</b>	<b>FREQUENCY</b>	<b>PERCENT</b>	<b>CUSTOMERS</b>	<b>FREQUENCY</b>	<b>PERCENT</b>
C.E.O	15	5%	<=100	133	50%
Director	11	4%	101 to 1000	77	29%
Manager	50	18%	>1000	55	21%
Owner	24	9%			
President	93	34%			
V.P.	43	16%			
Others (21)	37	14%			
<b>EMPLOYEES</b>	<b>FREQUENCY</b>	<b>PERCENT</b>	<b>SERVICE</b>	<b>FREQUENCY</b>	<b>PERCENT</b>
<10	105	38%	<=5	68	25%
10 to 50	118	43%	6 to 10	64	24%
51 to 100	26	10%	11 to 20	75	28%
>100	24	9%	>20	61	23%

Table 5.7 - continued

<b>SALES</b>	<b>FREQUENCY</b>	<b>PERCENT</b>	<b>PURCHASES</b>	<b>FREQUENCY</b>	<b>PERCENT</b>
<1MIL	49	20%	<=100K	67	29%
1 to 10 MIL	148	60%	101K to 500K	90	38%
10 to 100 MIL	45	18%	501K to 1 MIL	34	15%
>100 MIL	3	1%	>1 MIL	43	18%

These characteristics are reflective of our target sample frame; we targeted small manufacturers that are suppliers to large customers. Both the median and mean figures for number of employees do not exceed the 250 employee threshold we set for this thesis earlier; also the employee groupings show the majority of the number of employees are less than 100. In a small business upper management and owners typically function in multiple roles and represent their company with the public directly; the sample demographics reflect this aspect since over half of the respondents are either the President or the Vice-President of the organization. Sales in 2005 for most of the respondents were \$10 million or less, which is typical for most US small businesses. Most small businesses are niche marketers, serving a few customers rather than mass market penetration; the sample demographics also confirm this characteristic as most of the respondent organizations have 100 or fewer total customers. The number of service years is surprising; most small business that have been in business more than 5 years have had senior-level management for the life of the organization; the sample demographics would have been expected to show a majority of the respondent individuals to been in service more than 10 years. Instead the numbers are fairly evenly divided in all the year groupings with just a slight superiority for service grouping from 11 to 20 years.

The question concerning the special relationship that limits participation of other customers and suppliers yielded 104 (46.9%) positive responses; this would indicate that the

relationship between the respondent organization and Customer C has developed special attributes over time that are considered important and significant by the respondent.

## 5.8 Data Analysis

### ***5.8.1. Assessing the Measurement Model***

The measurement model is developed to ascertain the relationship between the indicators and the latent construct they are intended to measure. Assessment of the measurement model involves two type of validities: convergent validity and discriminant validity (Chin, 1998). Convergent validity is the degree to which theoretically similar constructs are highly correlated with each other; while discriminant validity indicates the degree to which a given construct is different from other constructs.

### ***5.8.2. Convergent Validity***

We assess convergent validity by first evaluating the loadings of the individual measures to their respective constructs using Partial Least Squares (PLS Graph, version 3.00). The values for TC are differences between two respondent answers for each question item to cover the changes over time. Thus, loadings on the differences would not be reflective of the constructs. Therefore two loading evaluations were conducted. One iteration evaluated the model using the respondent answers for the time period 5 years ago, and the other iteration used the respondent answers for the current time period. The resulting loadings were examined for values above 0.60 and also for inconsistencies between the two time periods.. Appendix F shows the loadings of indicators with their respective constructs. The following items had loadings lower than 0.60 and were removed from the study: TC3, TC5, TC7, TC9,TC12, TC13, TC14, and TC17. Table 5.8 lists all Transaction Costs items and their resulting status.

The trimmed model was rerun and reevaluated. The weights and loadings for the measurement items are presented in Appendix G. As can be seen, the loadings for all the items are over the recommended level of 0.70, except TC8 which is close to 0.70 and is retained. Item loadings of 0.70 or higher imply that more than 50% of the variance is shared between the measurement item and its theorized construct.

Table 5.8 Model Status for TC Items

<b>Item</b>	<b>Model Status</b>
TC1	Retained
TC2	Retained
TC3	<i>Dropped</i>
TC4	Retained
TC5	<i>Dropped</i>
TC6	Retained
TC7	<i>Dropped</i>
TC8	Retained
TC9	<i>Dropped</i>
TC10	Retained
TC11	Retained
TC12	<i>Dropped</i>
TC13	<i>Dropped</i>
TC14	<i>Dropped</i>
TC15	Retained
TC16	Retained
TC17	<i>Dropped</i>
TC18	Retained

For convergent validity, we also examined the scales for composite reliability using PLS Graph with the dropped items removed (see Table 5.8 above). The correlations, composite reliability and average variance extracted (AVE) of latent variables and path coefficients are shown in Table 5.9. All constructs showed a composite reliability score of 0.80 or greater. Composite reliability values greater than 0.80 indicate good internal consistency [106].

### 5.8.3. Discriminant Validity

Discriminant validity determines the extent to which one construct is different from all other constructs in the research model. To establish discriminant validity, we first attempt to ascertain that measures of a construct are distinct and the measures should load more strongly on their theorized construct than on the other constructs in the research model. In other words, the loadings should be greater than the cross loadings. The results, as shown in Appendix H, contain all loadings and cross loadings. Examination of these results indicate that all the measurement items load higher on their own construct than on other constructs.

To establish discriminant validity, we also examine the average variance extracted (AVE) to ensure that each construct shares larger variance with its measures than with other constructs in the research model. This calls for the construct's AVE to be at least 0.50 or the square root of the AVE should be greater than the correlation of the construct with other constructs. The analysis results in Table 5.9 confirm that there is evidence of discriminant validity, with the Transaction Costs construct marginally satisfying the criteria.

Table 5.9 Correlations, CR, and AVE Values (N = 301)

Construct	CR	AVE	Correlations		
			IT Buildup	Trust Buildup	Transaction Costs Change
IT Buildup	0.870	0.435	<b><i>0.660</i></b>		
Trust Buildup	0.955	0.726	0.252***	<b><i>0.854</i></b>	
Transaction Costs	0.866	0.416	-0.253***	-0.590***	<b><i>0.645</i></b>
CR: Composite Reliability; AVE: Average Variance Extracted; Bold, italicized numbers on the diagonal are the square roots of the AVE values. *** significant at 0.01      ** significant at 0.05      * significant at 0.1					

The measurement model is the relationships between the constructs and their indicators.

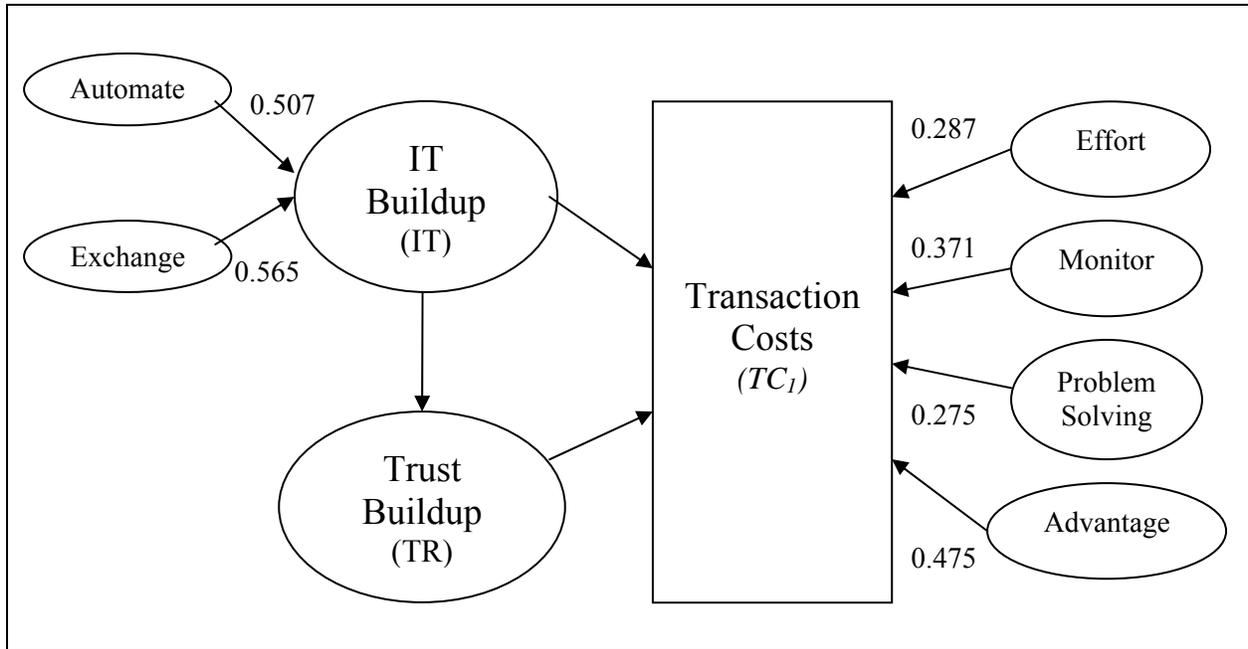


Figure 5.1 Measurement Model – 5 Years Ago

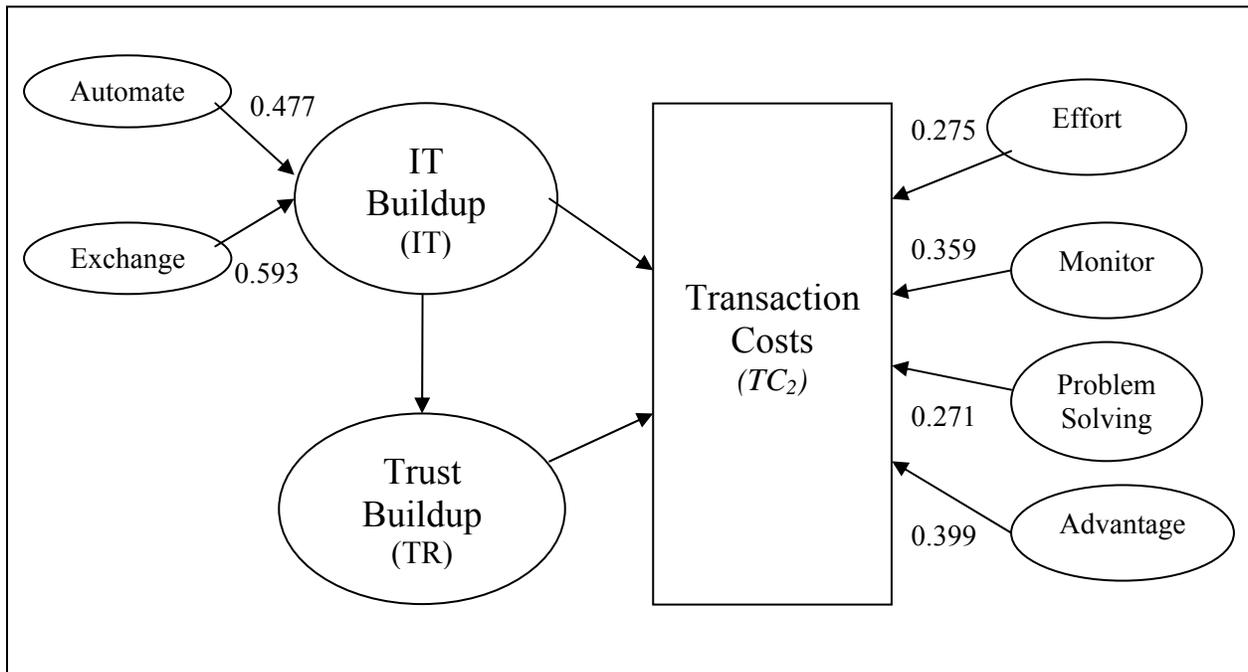


Figure 5.2 Measurement Model - Current

#### 5.8.4. Assessing the Structural Model

Transaction Cost is conceptualized as a higher order construct comprised of Effort, Monitoring, Problem Solving, and Advantage. IT Buildup is also a higher order construct formed

by Automate, Monitor, and Exchange. The final model shows the paths in the model with their path coefficients.

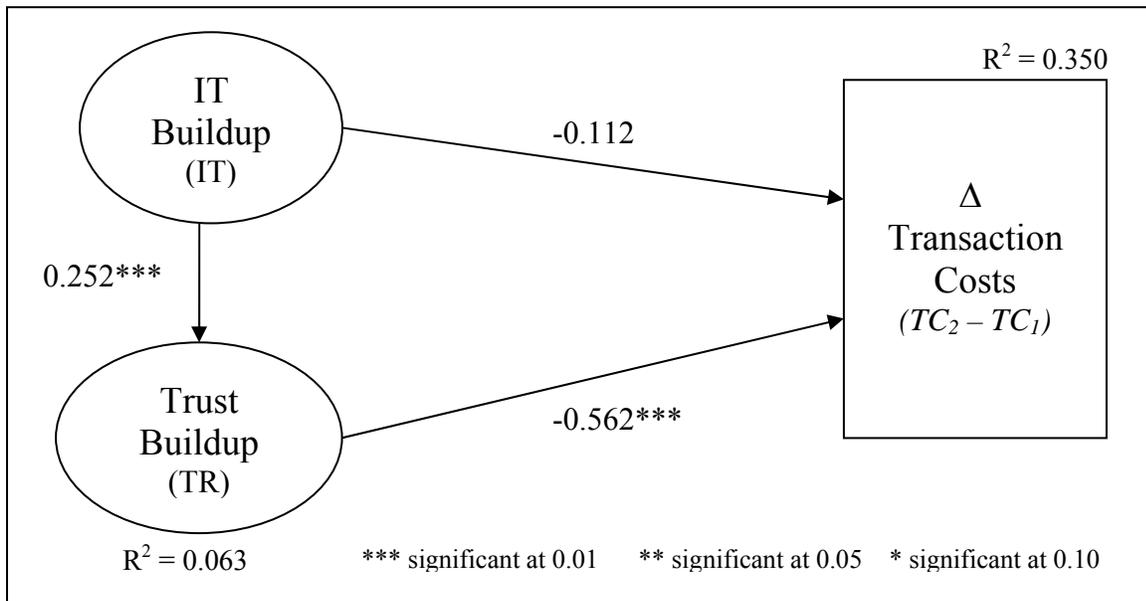


Figure 5.3 Structural Model

### 5.8.5. Testing the Hypotheses

The model is tested by assessing the significance of the paths stated in the model. The results are discussed below.

Hypothesis 1: IT Buildup is negatively related to Changes in Transaction Costs.

The buildup of Information Technology over time is inversely associated with the changes in Transaction Costs over time. Hypothesis testing showed a  $b = -0.112$ ,  $t$ -statistic = 1.1709,  $p$ -value  $> 0.10$ . The lack of support for this hypothesis implies that the level of IT technology built up over time does not directly impact the transaction costs of the dyad.

However, a direct relationship is supported as evidenced by correlation analysis (-0.253,  $p < 0.01$ ).

Hypothesis 2: Trust Buildup is negatively related to Changes in Transaction Costs.

As Trust builds over time in a dyad the Transaction Costs decrease. Hypothesis testing showed a  $b = -0.562$ ,  $t$ -statistic = 11.6851,  $p$ -value  $< 0.01$ . Support for this hypothesis implies that transaction costs over time can be reduced by fostering greater levels of trust over time.

Hypothesis 3: IT Buildup is positively related to Trust Buildup.

When IT is built up, there is a resulting rise in Trust due to increased information flow and general improvement in communication technology. Hypothesis testing showed a  $b = 0.252$ ,  $t$ -statistic = 4.0341,  $p$ -value  $< 0.01$ . Support for this hypothesis indicates that trust can be enhanced by increasing information technology expenditures to benefit the dyad.

Hypothesis 4: Trust Buildup mediates the relationship between IT Buildup and the Changes in Transaction Costs.

According to Baron and Kenny [10], in the mediation hypothesized above there should be a significant path between IT and TC, there should also be a significant path between IT and Trust, there should be a significant path between Trust and TC, and the path between IT and TC

should become insignificant after controlling for Trust. We isolated the three constructs and ran PLS and bootstrapping to look for significance.

Table 5.10 Mediation of Trust Buildup

Step	Model	I. V	D.V	Coefficient	Std. Error.	T-Stat	Significant
1	Direct	IT	TC	-0.309	0.1531	2.5416***	Yes
2	Direct	IT	Trust	0.266	0.0519	5.1268***	Yes
3	Direct	Trust	TC	-0.592	0.0306	19.3219***	Yes
4	After controlling for Trust	IT	TC	-0.112	0.0956	1.1709	No
Results: There is evidence of complete mediation.							
		*** significant at 0.01		** significant at 0.05		* significant at 0.1	

From Table 5.10 we can conclude that enough evidence was found to support the hypothesis that trust mediates the relationship between Information Technology Buildup and the Changes in Transaction Costs. The relationship between IT and TC is no longer significant after mediation; therefore trust is a necessary ingredient for IT buildup to influence changes in transaction costs.

Hypothesis 5: The impact of IT Buildup on Changes in Transaction Costs will be strongest in the Market Transaction Environment.

The market environment is noted by absence of dominance of either buyer or supplier. The resulting costs in vendor and customer searches, purchase and monitoring expenses, as well as remediation expenses make transaction costs high. Information technology can ameliorate these expenses through automation and rapid, reliable information exchange. In supplier and customer dominate environment there is an existing level leverage by one party that acts as a

damper against opportunistic behavior, thereby lowering total transaction costs. Therefore, the market environment should show the greatest impact of IT on transaction costs.

Statistical tests of between-subjects effects for hypotheses 5 through 7 using SPSS found no significant interaction effects for the transaction environments. However an examination of the expected values of the regression models for each of the three transaction states can provide some insight.

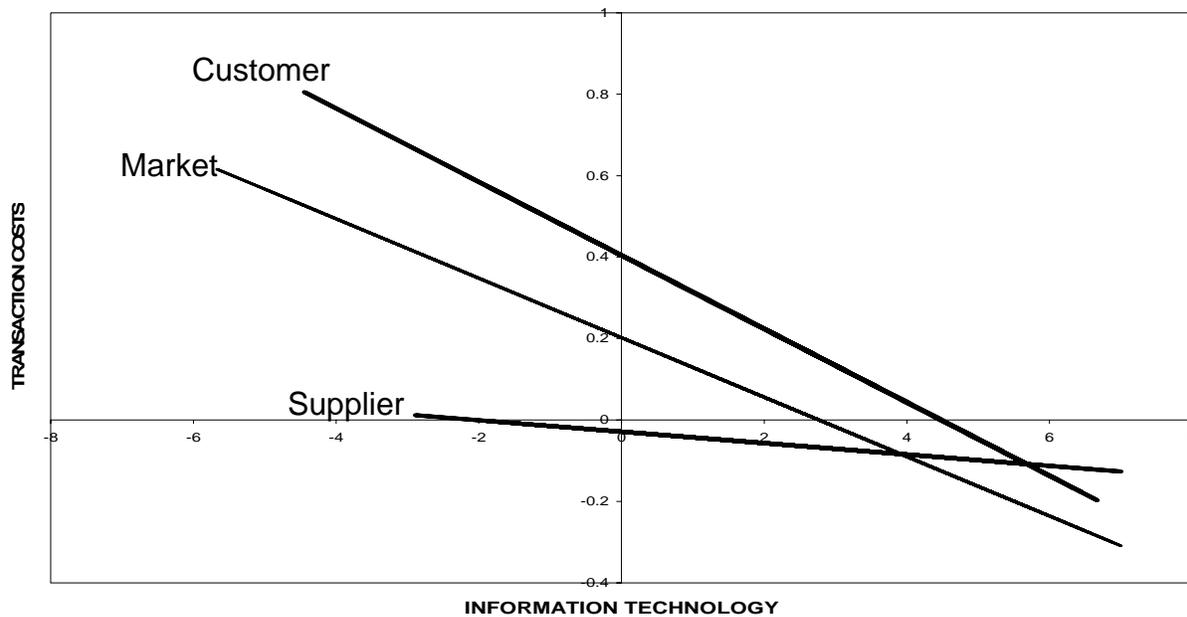


Figure 5.4 IT - TC Regression by Environment

Figure 5.4 reveals the negative relationship between IT Buildup and Changes in Transaction Costs. It also demonstrates that the relationship in the supplier dominate environment appears to differ decidedly from the other two environments which have similar impacts. The customer dominate environment shows the most strength in the IT-TC relationship. This result does not support the hypothesis. In this thesis the supplier is a small business and the customer is a large business; it is possible that the customer dominates because many small businesses are forced into adopting and using information technologies to benefit the large

customer. Therefore IT usage is more prevalent and IT investment is heaviest where it is a requirement to do business; hence the customer dominate environment shows the strongest IT-TC relationship because it is where IT is most used.

Hypothesis 6: The impact of Trust Buildup on Changes in Transaction Costs will be weakest in the Market Transaction Environment.

The influence of trust in a buyer-supplier dyad should be the least felt when there are many buyers and many suppliers each with the freedom to switch easily. There is no assurance of any future business dealings and therefore there is little incentive to foster a trusting relationship. In supplier and customer dominant environments, one party must inherently trust the other party to some degree and hence there is the opportunity to increase trust.

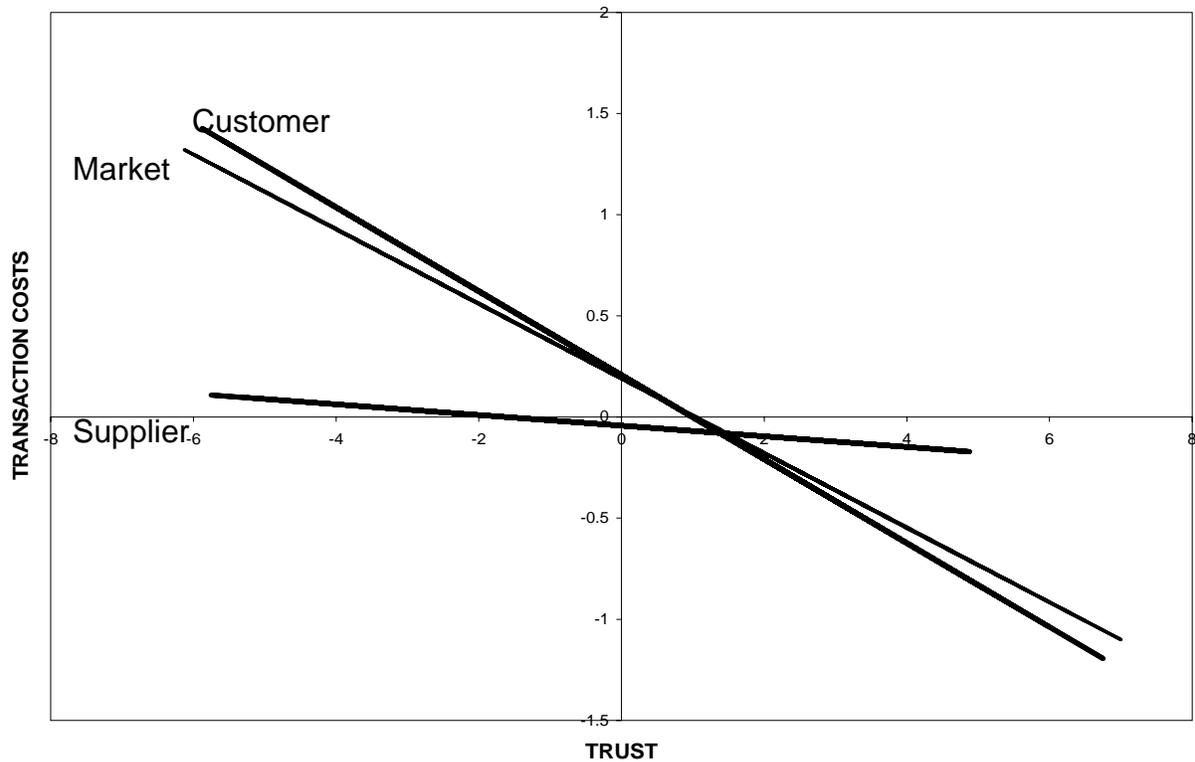


Figure 5.5 Trust - TC Regression by Environment

Figure 5.5 shows the negative relationship between Trust Buildup and Changes in Transaction Costs. However, the hypothesized weak market dominate influence is not demonstrated; the market dominance environment and the customer dominate environment are nearly identical in strength. In the supplier dominate environment the customer has little choice but to accept the terms of the supplier; there is little need or motivation for the supplier to expend time and resources to increase trust with a customer that can go nowhere else. In the customer dominate environment, however, there is an incentive for the supplier to prevent switching by the customer by making the business more reliable and trustworthy than competing suppliers. In this thesis the supplier is a small business and the customer is a large business; this situation is typically a market environment. It is reasonable that a small supplier would wish to distinguish

itself from the rest of field by enhancing trust with a lucrative large customer; trust would be one of the few ways to be competitive since market environment competition essentially precludes any price-based competitive advantage, especially in the long term.

Hypothesis 7: The impact of IT Buildup on Trust Buildup will be strongest in the Customer Dominate Transaction Environment.

This hypothesis revolves around the question of expenditure and payback. The expenditure for IT needs to be placed where it will have the greatest chance of making an impact. In terms of increasing trust, the customer dominate environment offers the most opportunity to make an impact because there are many suppliers and few customers. Therefore, a business cannot price compete; it must use trust to distinguish itself from other suppliers and lock in the customer. In a supplier dominate environment, there no need or motivation for the supplier to distinguish itself and in the market environment such efforts offer little hope for long-term effectiveness since there is no guarantee of future business dealings.

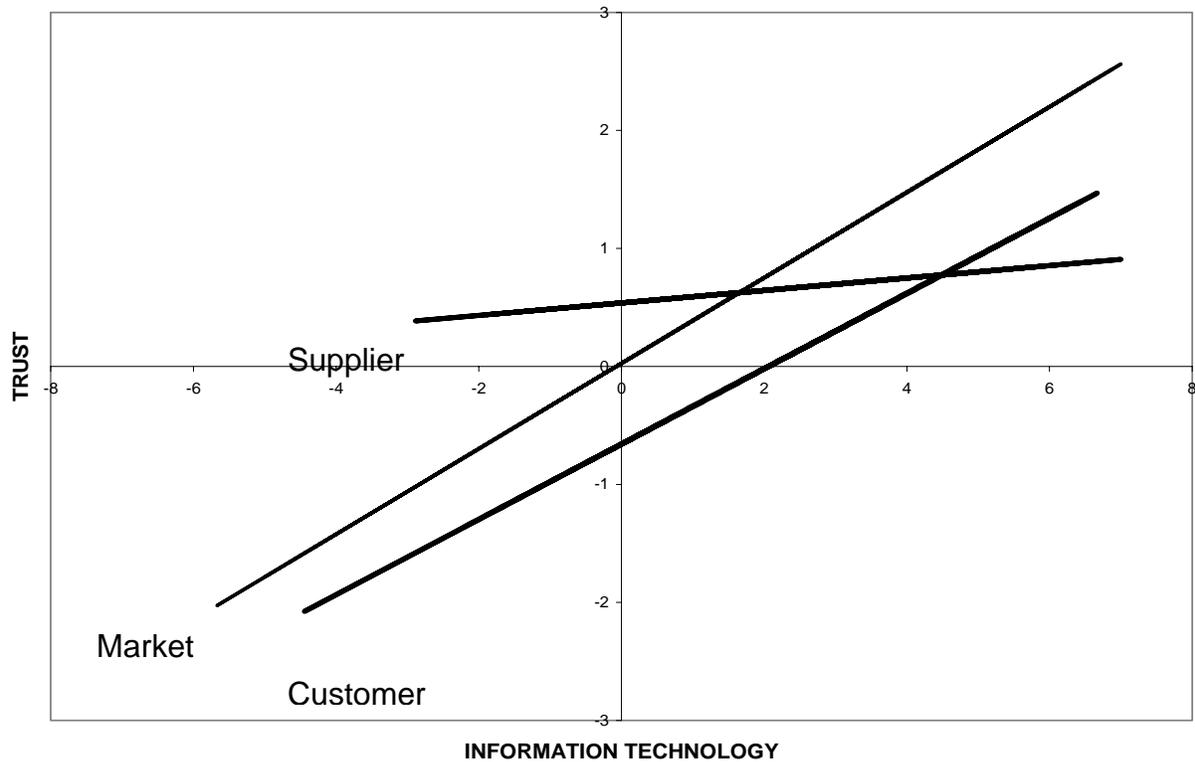


Figure 5.6 IT - Trust Regression by Environment

Figure 5.6 demonstrates the positive relationship between IT buildup and trust buildup. It does not support the hypothesis that the relationship is strongest in the customer dominate environment. Although customer and market are very similar, the market dominate environment shows the greater strength. The explanation of this phenomenon is a matter of degree. The chart would indicate that trust is a slightly greater competitive tool for the small business in a market environment than in the customer dominate environment. The rationale is similar for both environments; trust is a means for the small business supplier to distinguish itself in the eyes of the large customer. In a customer dominate environment, a small supplier to a large customer has largely been guided in making IT expenditures by and for the benefit of the large customer; therefore there was already in inherent level of trust which could be developed. However, in the market dominate environment there was no such inherent trust level and therefore the impact of

IT buildup on trust buildup would be greater since it started from near zero. Thus the degree of impact is slightly greater in the market environment than in the customer dominate environment.

### 5.9 Open-ended Questions

The questionnaire for this study included 6 open-ended questions. Based on the responses for the description of Product P, it would appear that the largest percentage the respondents are in the electric and electronic industry (21%); there are also a good number of products representing machined goods (18%), military goods (7%), and health-related items (9%).

Table 5.11 Descriptions of Product P

Product Description	Frequency (N = 301)	Percentage
Military goods	21	7%
Building supplies	11	4%
Construction	13	4%
Electric and electronics	63	21%
Textiles	9	3%
Machined parts	53	18%
Health and fitness	26	9%
Packaging and shipping	20	7%
Household items	7	2%
Chemicals	16	5%
Food and agriculture	4	1%
Service-related products	19	6%
<i>Non-response</i>	39	13%

There were two questions about the relationship between the respondent business and its larger customer; one that asked what the company has done in the past 5 years to improve the relationship, and one that asked what the company should be doing now to affect relationship

improvements. Most of the responses for both questions involved the increase in communication, increasing personal relationship ties, and improving operational efficiencies.

Table 5.12 Improvements by Supplier

Improvement	Past 5 years		Current	
	Frequency (N=301)	Percentage	Frequency (N=301)	Percentage
Relationship	42	14%	48	16%
Support	49	16%	27	9%
Customer Service	15	5%	8	3%
Product quality	18	6%	14	5%
Communications	58	19%	32	11%
Operations	65	22%	52	17%
<i>Non-response</i>	54	18%	120	40%

There were also two similar questions about the customer's role in the relationship; one asking what the customer has done in the past 5 years to improve relations and one asking what the customer should be doing now. Here again, increasing communication is the prevalent response; however, improving the relationship and operational efficiencies are also frequent responses.

Table 5.13 Improvements by Customer

Improvement	Past 5 years		Current	
	Frequency (N=301)	Percentage	Frequency (N=301)	Percentage
Relationship	43	14%	22	7%
Support	43	14%	30	10%
Customer Service	0	*	0	*
Product quality	0	*	0	*
Communications	35	12%	45	15%
Operations	41	14%	35	12%
<i>Non-response</i>	139	46%	169	56%

The responses to these questions highlight the importance of this research. Most small businesses today see strategic value in the fostering of better communications, mutual trust, and

long-term relationships. They also see a link between these strategies and the improvement of operational efficiency and effectiveness.

#### 5.10 Summary

From the significant test results we learn that increasing trust can have significant effects on transaction costs. Increasing IT can have a similar impact on transaction costs but to a lesser degree. The results also demonstrate that IT increases and increases in trust levels are related. Trust completely mediates the relationship between IT buildup and changes in transaction costs; however, correlation significance supports a finding of a direct relationship.

The effect of transaction environments on these relationships are notable but are non-significant sample results. The hypotheses on transaction environments were insignificant and no conclusions can be drawn from them; however, they do prompt exploratory observations. In all three environments the supplier dominate environment effects are not as strong and are quite dissimilar from both customer dominate and market environments; the customer dominate and market environments are nearly parallel each other in each of the direct relationships.

In the relationship between IT buildup and changes in transaction costs, the customer dominate environment shows the greatest strength; this would imply that IT can exert greater leverage on changing transaction costs in situations where a large customer possesses bargaining power. A small supplier can reduce the cost of doing business with the larger, more powerful partner and hence become more competitive.

In the relationship between trust buildup and changes in transaction costs, customer dominate and market environment must share nearly equally in the impact. The small supplier

can effectively use trust in either environment to control the transaction costs and remain or enhance competitive positions with larger customers.

In the relationship between IT buildup and trust buildup, the market environment demonstrates more strength than the other two environments. Perhaps this is simply indicative of the greater change in trust buildup possible in the market environment rather than in the customer dominate environment. It is clear from this analysis, however, that a small supplier in the market environment can build trust with a large customer to be competitive and to become a preferred vendor.

## CHAPTER 6

### DISCUSSION AND CONCLUSION

#### 6.1 Discussion

##### ***6.1.1. Contribution***

This thesis presents a process view of how IT and trust affect transaction costs. It goes beyond functional relationships between variables to examine empirical connections between sequences of events and outcomes. Therefore, it provides a more complete explanation than a variance study. The thesis presents a dual perspective of affective elements; the IT buildup represents the technological aspects of changes in transaction costs and the Trust buildup represents the human aspects. Thus, a holistic picture of changes to transaction costs over time is portrayed. This is the only study to present both holistic and longitudinal examination of transaction costs. Also, this is the only study to present a direct, longitudinal examination of the impacts of IT on transaction costs; the study by Grover et al. [63] examined the IT-transaction cost relationship in cross-section only.

This thesis offers a better understanding of the strategically-related changes in transaction costs, IT, and trust in light of different environmental conditions. This is the only study to present a longitudinal study of transaction costs that incorporates the environmental condition and the supplier perspective. Therefore it corresponds more faithfully to actual organizational dynamics than those in previous studies, especially those studies that were cross-

sectional in nature. Also, this thesis presents a greater understanding of the effect of information technology in the mechanics of Transaction Cost Economics.

The base model emphasized the impact on transaction costs by IT and trust buildups over time. Trust buildup was shown to be the strongest determinant of the reduction in transaction costs; IT buildup demonstrated that it too could reduce transaction costs, but with less influence than trust buildup.

The longitudinal nature of the findings in this thesis is a unique contribution. Cross sectional studies do not provide the richness of insights that time-based research provides. Cross sectional research can provide point-in-time relationships and directionality but cannot state that the next time period will produce similar results. This thesis provides information about relationships, directionality, and how they change over time; thus, introducing a new viewpoint and deeper understanding of the phenomena.

Another contribution of this thesis is the finding that IT is needed to make changes in transaction costs. IT does have a direct relationship with transaction costs and is an important consideration in decisions regarding transaction costs between trading partners of unequal size.

The consideration of the business environment is another contribution of this thesis. The environment can have an overarching influence on the decision making and behavior of participants in the buyer-seller dyad.

### ***6.1.2. Contribution to Research***

Transaction cost theory and social exchange theory have provided the basis of most research on supply chains and the customer-supplier dyad. The relationships between customer and supplier include aspects of economics, behavior, technology, time, and the environment.

Most research reflects a viewpoint focused by the researchers' discipline and therefore presents a limited, less holistic view of the dyad. The dyad, however, does not have the luxury of a restricted view; it must behave, operate and make decisions that accommodate all aspects of the relationship. Therefore, it is not surprising that most research in this area appears fragmentary, missing elements that may be very important in understanding the phenomenon.

This thesis attempts to move the research in the direction of completeness in order to more fully understand the phenomena by including time and environmental concerns, two areas keenly felt in dyad behavior. In addition to these two elements, this thesis encompasses constructs from different theoretical areas to provide more comprehensive insights and interpretations. The result is a research framework that is broad in theoretical scope without unduly sacrificing elemental depth.

The principal drawback to longitudinal, social research is time itself; most researchers do not have the freedom to wait the sufficient amount to assure significant changes in the social phenomenon. This thesis demonstrates that there is a way to do quasi-longitudinal research, obtain viable results, and avoid the time-related drawback.

The inclusion of the time element in this thesis clearly demonstrates why cross-sectional research on the link between IT and transaction costs have produced weak results that were often contradictory to theory. For instance, the Grover et al. (2002) study found a significant positive relationship (0.15) in their cross-sectional study despite theory that predicted a negative relationship; in our thesis we showed the opposite, a negative relationship (-0.309) which is in line with theoretical predictions. Thus this thesis contributes the importance of the time element in the substantiation of transaction cost economics when considering IT.

### ***6.1.3. Contribution to Practitioners***

This thesis can make two main recommendations to small business suppliers of large customers:

- Build up IT to enhance trust, especially in the exchange of information and the monitoring of transaction costs.
- Build up trust, especially in free-market environments where there many competitors and many buyers.

Small businesses can use this thesis to better understand how they can use IT and trust to overcome competition based on price and better link the future success of their large customers with their own. Technological and behavioral aspects of the supply chain dyads are especially complicated and intertwined for the small business. Small business is generally limited in funds, non-specialized in expertise, and often at a disadvantage with large customers. However, small business is more agile, creative, and more in tune with customers. This thesis can assist small business in enhancing and leveraging their agility, creativity, and insight by judiciously building up IT and trust.

Information technologies for business have been steadily decreasing in price and increasing in functionality. These two elements are now at a stage where most small businesses can invest in IT with directed purpose and sufficient user skills to attain strategic benefits. Also, large business has increasingly sought out partnerships and alliances with small business to tap into their strengths; a major part of these unions is the exchange of information, often with technology mandated by large business. Therefore, the choice for small business is not whether to increase IT expenditures but how and when. This thesis offers insights by suggesting small business increase IT to enhance trust, especially in free markets.

IT can level the playing field between large and small business, but trust carries the ball. It is the interpersonal and interorganizational level of trust that overcomes pure price competition in a free market environment. By carefully utilizing IT to automate and increase the exchange of information, small business can leverage their innate strengths towards a strategic partnership with their large customers. As more information is exchanged, the risk of opportunism by the large customer diminishes; this is a concern close to the heart of any small business dependent on or desirous of patronage by a large customer.

The buildup of IT and trust requires two things, time and money. Businesses would not undertake the task if there was not some promise of return in excess of investment. This thesis demonstrates that small business does consider the time and money spent to be worthwhile. The reduction of transaction costs equates to rates of return sufficient to fuel the formation of strategic partnerships.

## 6.2 Limitations and Assumptions

This study is a quasi-longitudinal study. We are asking respondents to recall the conditions of five years ago and now rather than taking separate direct measurements at those points in time. Based on other studies that have used a five-year period to separate measurements, we believe this amount of time is adequate to capture focal changes for our study while maintaining as high a recall accuracy as possible. However, recall bias and single-instrument bias is possible.

The choice of a longitudinal study is essential in determining causal relationships. This approach is relatively rare in the social sciences but is common in the natural sciences, especially

medicine and health sciences, where it has been employed, for instance, to determine causal links between behaviors, such as exercise, and overall health characteristics [23, 25, 54, 98, 101, 107]. In a similar vein, this study seeks to understand the causal links between business behavior (investments in IT and trust) and organizational “health” (reduction of transaction costs). The movements over time of both independent and dependent variables constitute the best evidence of causality.

The perspective of the study is the supplier. We do not obtain information from both sides of the dyad. Therefore, some interactive nuances may be lost and some motivations behind supplier actions that were initiated customer’s actions may be invisible to this study.

The identification of adaptive efforts is not exhaustive. There may be other things that affect transaction costs that are not considered in this thesis, for example the role of technological change or governmental influence is not included. Likewise, there may be dependent variables other than transaction cost, for instance financial performance, market share, or relationship satisfaction was not chosen for this thesis.

In addition to these limitations are the limitations inherent in any survey study—response bias, sample selection bias, questionnaire constructs information obtained, respondents offer no information beyond the questionnaire. The electronic aspect of this survey also presents some limitations; the respondents will likely be those with technological expertise, some respondents will ignore or filter out the contact email as spam, other respondents will not participate due to privacy concerns about the internet. The low response rate is a limitation of this thesis. However, the statistical tests for non-response bias and the large respondent to construct ratio is adequate to offset concerns for bias.

The study by Grover et al. [63] found a strong (-0.40) relationship between relationalism and transaction costs. Therefore a question could be offered as to why relationalism is not a stated, measured part of this study. The studies cited earlier in this thesis are in consensus that trust is the main, and often determinate, construct of relationalism. Relationalism is an outcome of a mental state which is trust. Although relationalism contains other constructs, relationalism cannot exist or increase without the corresponding existence or increase in trust. The study by Grover et al. [62] also found a significant positive relationship (0.15) between IT and transaction cost. This relationship is misleading; it is due to the cross-sectional nature of the study where the effects of IT had already been full incorporated into the transaction costs. In other words, the cross-sectional picture portrays the “after” view only, it does not consider the changes that resulted in the relationship and hence cannot be causally interpreted. It is interesting and instructive that our results showed the opposite: a significant negative relationship (-0.309) between IT buildup and changes in transaction costs. Also, by measuring trust as an ongoing, dynamic state of mind, a causal path could be mapped to link empirically the changes in trust with the changes in transaction costs. We believe, therefore, that trust constitutes a more singular, direct and measurable construct than relationalism.

This thesis lacks a clear outcome measure. The reduction in transaction costs is an interim outcome that has been linked in prior research to performance improvements in organizations. Therefore, we believe that the reduction in transactions costs can act as a surrogate and acceptable outcome measure.

This study also makes some assumptions. We assume that the respondent will be knowledgeable about the issues presented in the questionnaire and that the respondent will answer candidly from the organization’s viewpoint rather than from a personal bias. We assume

that the SBA database information is accurate, up-to-date, and is a representative sample of all SME manufacturers. We assume that the questionnaire presents issues that can affect the survival and prosperity of SME manufacturers.

### 6.3 Future studies

This thesis approached the buyer-supplier dyad from the standpoint of the supplier. In dyads where the small business is the buyer and the large business is the supplier, it would be interesting to see if the same relationships hold between transaction costs and the buildups of IT and trust.

Other constructs could be added to enhance this study. Trust could be split to distinguish between interpersonal, organization, and reputational trust. IT could include constructs to distinguish the degree each technology is used and/or the perceived usefulness of these technologies. Transaction costs could include the perceptions of dyadic costs reductions from the viewpoint of the large customer.

The dyad was chosen as the focus of this thesis partly to simplify the study and partly to focus on enhancing the granularity of the relationships. However, the research could be extended to study multiple partners in the supply chain.

A more ambitious project would be the pure longitudinal study of the thesis phenomena. This project would require a tremendous investment in time and would be subject to complications due to personnel loss at respondent organizations, economic and environmental changes during the study, and dramatic changes at the partner organization which could influence dyadic behavior.

This thesis focused on manufacturers. Future research could further refine this study by focusing on individual industries. Also, a study focusing on service that would be compared to these manufacturing results would be contributory to understanding the phenomena.

#### 6.4 Conclusion

Modern business is becoming less about competition between companies and more about competition between supply chains. Large businesses are mandating fewer suppliers, closer ties with suppliers, and more support by small businesses to remain agile and resourceful. The increased attention to the supply chain focuses increased pressure on the customer-supplier dyad to increase its effectiveness and efficiency.

We have developed a theoretical framework of the relationships between the buildup of IT, the buildup of trust and the reduction in transaction costs with the influence of the transaction environment on the relationships. These principal components of the customer-supplier dyad are elemental to the performance of the entire supply chain. From the perspective of the small business supplier, these components are crucial to profitable, long-term partnerships that can yield positive strategic advantages.

By enhancing trust and IT small business suppliers to large business can move from a price-only based supplier that cannot be assured of a place in the supply chain from one purchase to another, to a valued strategic partner that will have a productive and influential role in determining the success of the entire supply chain.

## APPENDIX A

### BENSAOU'S CONTEXTUAL PROFILE FRAMEWORK

High	<p><b>Captive Buyer</b></p> <p>Product characteristics</p> <ul style="list-style-type: none"> <li>• Technically complex</li> <li>• Based on mature, well-understood technology</li> <li>• Little innovation and improvements to the product</li> </ul> <p>Market characteristics</p> <ul style="list-style-type: none"> <li>• Stable demand with limited market growth</li> <li>• Concentrated market with few established players</li> <li>• Buyers maintain an internal manufacturing capability</li> </ul> <p>Supplier characteristics</p> <ul style="list-style-type: none"> <li>• Large supply houses</li> <li>• Supplier proprietary technology</li> <li>• Few strongly established suppliers</li> <li>• Strong bargaining power</li> <li>• Automakers heavily depend on these suppliers, their technology and skills</li> </ul>	<p><b>Strategic Partnership</b></p> <p>Product characteristics</p> <ul style="list-style-type: none"> <li>• High level of customization required</li> <li>• Close to buyer's core competency</li> <li>• Tight mutual adjustments needed in key processes</li> <li>• Technically complex part or integrated subsystem</li> <li>• Based on new technology</li> <li>• Innovation leaps in technology, product, or process</li> <li>• Frequent design changes</li> <li>• Strong engineering expertise required</li> <li>• Large capital investments required</li> </ul> <p>Market characteristics</p> <ul style="list-style-type: none"> <li>• Strong demand and high growth market</li> <li>• Very competitive and concentrated market</li> <li>• Frequent changes in competitors due to unstable or lack of dominant design</li> <li>• Buyer maintains in-house design and testing capability</li> </ul> <p>Partner characteristics</p> <ul style="list-style-type: none"> <li>• Large multiproduct supply houses</li> <li>• Strong supplier proprietary technology</li> <li>• Active in research and innovation (i.e., R&amp;D costs)</li> <li>• Strong recognized skills and capabilities in design, engineering, and manufacturing</li> </ul>
Low	<p><b>Market Exchange</b></p> <p>Product characteristics</p> <ul style="list-style-type: none"> <li>• Highly standardized products</li> <li>• Mature technology</li> <li>• Little innovation and rare design changes</li> <li>• Technically simple product or well structured, complex manufacturing process</li> <li>• Low engineering effort and expertise required</li> <li>• Small capital investments required</li> </ul> <p>Market characteristics</p> <ul style="list-style-type: none"> <li>• Stable or declining demand</li> <li>• Highly competitive market</li> <li>• Many capable suppliers</li> <li>• Same players over time</li> </ul> <p>Supplier characteristics</p> <ul style="list-style-type: none"> <li>• Small "mom and pop" shops</li> <li>• No proprietary technology</li> <li>• Low switching costs</li> <li>• Low bargaining power</li> <li>• Strong economic reliance on automotive business</li> </ul>	<p><b>Captive Supplier</b></p> <p>Product characteristics</p> <ul style="list-style-type: none"> <li>• Technically complex products</li> <li>• Based on new technology(developed by suppliers)</li> <li>• Important and frequent innovations and new functionalities in the product category</li> <li>• Heavy capital investments required</li> </ul> <p>Market characteristics</p> <ul style="list-style-type: none"> <li>• High growth market segment</li> <li>• Fierce competition</li> <li>• Few qualified players</li> <li>• Unstable market with shifts between suppliers</li> </ul> <p>Supplier characteristics</p> <ul style="list-style-type: none"> <li>• Strong supplier proprietary technology</li> <li>• Suppliers with strong financial capabilities and good R&amp;D skills</li> <li>• Low supplier bargaining power</li> <li>• Heavy supplier dependency on the buyer and economic reliance on the automotive sector in general</li> </ul>
	Low	High
	<b>Supplier's Specific Investments</b>	

## APPENDIX B

### SUMMARY OF KEY MANUFACTURING STUDIES

<i>Reference</i>	<i>Sample Key</i>	<i>independent variable(s)</i>	<i>Key dependent variable(s)</i>	<i>Key findings</i>
Levy (1985)	69 manufacturing firms	Asset specificity, environmental uncertainty	The degree of vertical integration	Higher assets specificity and uncertainty is related to greater vertical integration.
Anderson (1985)	159 sales managers in the electronics industry	Asset specificity, uncertainty, transaction frequency	The use of direct sales force vs. manufacturing reps.	Behavioral uncertainty, asset specificity, and interactions are related to the use of direct (in-house) sales force.
Balakrishnan and Wernerfelt (1986)	93 manufacturing industries	Technological obsolescence	Vertical integration	Technological obsolescence has a negative impact on vertical integration.
Walker and Weber (1987)	60 outsourcing decisions in US auto manufacturer	Market competition, environmental uncertainty	Outsourcing	Interaction of uncertainty and competition affects outsourcing.
Heide and John (1988)	199 manufacturers agents in electrical equipment industries	Asset specificity of agency	Replacement of principal	Specific investments by agents are negatively related to replicability of the principal.
John and Weitz (1988)	88 industrial manufacturers	Asset specificity, environmental and behavioral uncertainty	Percentage of manufacturer sales through direct distribution channels	All variables are positively related to manufacturer's forward integration.
Noordweir et al. (1990)	140 manufacturers	Environmental uncertainty	Level of possession and acquisition cost	High relational governance lowers acquisition costs under conditions of high uncertainty.
Heide and John (1990)	155 manufacturing firms	Asset specificity, environmental and behavioral uncertainty	Joint action and relationship continuity	Both party asset specificity are related to joint action. Supplier-specific investments are related to expectations of continuity.
Walker and Poppo (1991)	99 supplier dyads of a large manufacturer	Asset specificity, competition	Transaction costs	Asset specificity is related to lower in-firm transaction costs.
Lieberman (1991)	203 manufacturers of chemical products	Supplier concentration, asset specificity, cost inputs	As related to integration vs. contractual arrangement	Higher cost inputs are related to higher backward integration

<i>Reference</i>	<i>Sample Key</i>	<i>independent variable(s)</i>	<i>Key dependent variable(s)</i>	<i>Key findings</i>
Sriram et al. (1992)	65 purchasing managers in large manufacturing firms	Asset specificity, perceived transaction costs	Buyer dependence, collaboration	Supplier-specific investments are negatively related to perceived buyer dependence. Transaction costs are positively related to collaboration propensity.
Heide and John (1992)	155 manufacturing and 60 supplier firms	Asset specificity, relational norms	Buyer's control over supplier's decisions	Buyer specific investments are positively related to control over supplier decisions only when both parties share relational norms.
Anderson and Weitz (1992)	378 large manufacturer–distributor relationships	Relationship-specific investments (actual and perceived)	Commitment to the relationship	Idiosyncratic investments are positively associated with both manufacturer and distributor commitment.
Parkhe (1993)	111 manufacturers	Perceptions of opportunistic behavior, history of cooperation	Performance of alliance, specific investments, contractual safeguards, perceptions of opportunistic behavior	Perceptions of opportunistic behavior are negatively related to alliance performance, specific investments and contractual safeguards. History of cooperation negatively related to perceptions of opportunism.
Maltz (1994)	147 manufacturing firms	Assets specificity, transactional frequency	Probability of outsourcing warehousing	Asset specificity has a negative and frequency has a positive relationship with outsourcing.
Stump and Heide (1996)	165 chemical manufacturers	Asset specificity	Incentive design and monitoring	Specific investments by buyers protected through specific investments by suppliers.
Bensaou (1997)	447 relationships in US and Japanese auto industry	Switching costs, ownership ration, contract length, goal compatibility, fairness, technological unpredictability, use of it	Cooperation	Most relationships significant for Japanese but not for US relationships. Behavioral conditions important for cooperation.

<i>Reference</i>	<i>Sample Key</i>	<i>independent variable(s)</i>	<i>Key dependent variable(s)</i>	<i>Key findings</i>
Azoulay (2000)	Over 5000 clinical trials in six major drug manufacturers	Complex knowledge production activities vs. generic data production activities	Outsourcing probability	Costly to monitor knowledge intensive trials tend to be managed in-house rather than outsourced.
Novak and Eppinger (2001)	7 key automotive systems from eight luxury car manufacturers	Product complexity	Sourcing decision	Significant positive relationship between product complexity and vertical integration.

APPENDIX C

QUESTIONNAIRE

**Part I**

**This part of the survey is about your company's relationship with a particular customer. Please select only ONE customer that satisfies as many of the following criteria as possible (please check all boxes that apply)**

This customer is considered a large business (1000 or more employees).	<input type="checkbox"/>
This customer has NO ownership in your company. (If yes, indicate percentage of ownership <input type="text"/> %).	<input type="checkbox"/>
There is an electronic linkage between your company and this customer (e.g. electronic data interchange, industry network, Intranet, Internet, etc)	<input type="checkbox"/>

**For the remainder of the questionnaire, base your answers on your company's relationship with this specific customer (Customer C) and only the main product (Product P) your company supplies to (or service for) Customer C. The main product is the product or service, or group of similar products or services, with the highest percentage of sales volume to Customer C.**

**Transactional Environment**

**This section concerns the environment in which your company operates. Even if conditions for your company fall between two of the following descriptions, please select one that best matches the conditions for your company for most of the period covering the past 5 years. Mark only ONE box.**

For the Past 5 Years	Select one box
----------------------	----------------

<b>Suppliers Dominance:</b> There are many customers but only a few suppliers; customers have weak bargaining power.	<input type="checkbox"/>
Customers Dominance: There are many suppliers but only a few customers; suppliers have weak bargaining power.	<input type="checkbox"/>
<b>Free Market:</b> There are many suppliers and many customers; each has the freedom to switch to other suppliers/customers at little or no cost. Your company has a choice of customers for Product P other than Customer C and likewise Customer C has a choice of suppliers for Product P other than your company. (Note: it is the freedom to switch and not the actual occurrence of switching).	<input type="checkbox"/>



### Managing the Relationship

	5 years ago							Now						
	Strongly Disagree			Strongly Agree				Strongly Disagree			Strongly Agree			
	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Both parties clearly understand what this relationship will involve.	<input type="radio"/>													
It is straightforward and easy to work out the main issues and necessary details of the relationship.	<input type="radio"/>													
It requires significant effort to determine individual roles to be performed by our firm and Customer C.	<input type="radio"/>													
It is easy to tell if we receive fair treatment from Customer C.	<input type="radio"/>													
It takes significant effort for us to conform to the specifications and quality standards of Customer C.	<input type="radio"/>													
We are in a good position to evaluate how fairly Customer C deals with us.	<input type="radio"/>													
Accurately evaluating Customer C requires a lot of effort.	<input type="radio"/>													
There is not much concern about Customer C taking advantage of this relationship.	<input type="radio"/>													

## Managing the Relationship

This section concerns *how you manage your working relationship* with Customer C. For EACH point in time, 5 Years Ago and Now, please indicate the extent to which you agree or disagree with the following statements.

	5 years ago							Now						
	Strongly Disagree			Strongly Agree				Strongly Disagree			Strongly Agree			
	1	2	3	4	5	6	7	1	2	3	4	5	6	7
It is costly, in time and effort, for us to clearly monitor Customer C's performance.	<input type="radio"/>													
The approach to solving problems with Customer C is clear-cut.	<input type="radio"/>													
There are standard solutions or approaches to problems that might occur with Customer C.	<input type="radio"/>													
Problem-solving is often challenging due to the nature of Product P.	<input type="radio"/>													
Although solutions to problems can be achieved, they would often need to be highly customized	<input type="radio"/>													
There are no incentives for Customer C to pursue their interests at the expense of our interests.	<input type="radio"/>													
It is easy for Customer C to alter the facts to get what they want.	<input type="radio"/>													
There is a strong temptation for Customer C to withhold or distort information for their benefit.	<input type="radio"/>													
It is difficult for Customer C to promise to do things and get away without actually doing them later.	<input type="radio"/>													
There exists, from Customer C's perspective, a significant motivation to take advantage of unspecified or unenforceable contract terms.	<input type="radio"/>													

### Part II: Information Technology

For the period covering the **past five years**, please indicate the *direction* and *extent* that the *use of information technology* has **changed** for each of the following activities. If there has been **NO** change, please do not answer that question.

	Increase or Decrease	Extent of Increase or Decrease						
		A Little						
		1	2	3	4	5	6	7
	<b>Check One</b>							
Exchanging information on technical product requirements for Product P.	<input type="radio"/> Increase	<input type="radio"/> Decrease	<input type="radio"/>					
Ordering raw materials or components for Product P.	<input type="radio"/> Increase	<input type="radio"/> Decrease	<input type="radio"/>					
Shipping and receiving of Product P's raw material or components.	<input type="radio"/> Increase	<input type="radio"/> Decrease	<input type="radio"/>					
Inventory control for raw material or components for Product P.	<input type="radio"/> Increase	<input type="radio"/> Decrease	<input type="radio"/>					
Exchanging information on finished goods inventory for Product P.	<input type="radio"/> Increase	<input type="radio"/> Decrease	<input type="radio"/>					
Exchanging information on production schedules for Product P.	<input type="radio"/> Increase	<input type="radio"/> Decrease	<input type="radio"/>					
Exchanging information on anticipated demand for Product P.	<input type="radio"/> Increase	<input type="radio"/> Decrease	<input type="radio"/>					
Exchanging information on costs or prices for Product P.	<input type="radio"/> Increase	<input type="radio"/> Decrease	<input type="radio"/>					
Placement of orders for Product P.	<input type="radio"/> Increase	<input type="radio"/> Decrease	<input type="radio"/>					

**Part III Please provide us with the following information**

Please briefly describe Product P

Number of employees currently (approx.)

What is your company's 2005 sales volume (approx.)? \$  (millions).

For the past 5 years, do you have a special relationship (formal or informal) with Customer C that greatly restricts the participation of other potential customers and suppliers?  Yes  No

How many customers do you have for all of your products (approx.)?

Is Customer C a foreign company?  Yes  No

Does Customer C purchase multiple products in addition to Product P?  Yes  No

---

What is your job title?

and how long have you been working in this company?

years

---

What are Customer C's typical annual purchases of Product P? \$

---

What is the most significant thing your company has done in the past 5 years to improve the relationship with Customer C?

---

What do you think your company should be doing to improve your relationship with Customer C?

---

What is the most significant thing Customer C has done in the past 5 years to improve the relationship with your company?

---

---

What is the most significant thing Customer C has done in the past 5 years to improve the relationship with your company?



---

If you have any other thoughts and observations about Customer C, Product P or your relationship/linkages with Customer C (or customers in general) that are not covered in this survey, feel free to describe it in the space below:





## Thank You for completing the survey

To be entered in the drawing for the iPod Shuffles, please enter your e-mail address below. This email address will be kept confidential and will only be used to contact the winners of the iPod Shuffle Drawing. It will in no way be linked to your survey responses.

Email

Submit

APPENDIX D

SURVEY LETTER



Dear Sir/Madam:

As a successful small business person, you are familiar with the challenge of managing profitable relationships with large customers. Here at the University of Texas, we are conducting pioneering research in order to help you to further improve your effectiveness in this regard. You are invited to participate in our research effort by filling out a survey on-line.

**Your input is vital and will be deeply appreciated!**

If you complete the survey by October 20th, you will be entered into a drawing to win one of five iPod Shuffles. If you are not permitted to win such gratuities, a donation on your behalf for an equal value will be made to your favorite charity.



The survey will take about 20 minutes to complete. The responses will be strictly confidential and will in no way be linked to any individual respondent.

**If you would be willing to participate, please go to the survey**

<http://www2.uta.edu/infosys/survey/ww/pagesb.asp>

Thank You very much!

James Teng, Ph.D, West Distinguished Professor  
William Willette, Research Associate  
Department of Information Systems and Operations Management, College Of Business,  
University Of Texas at Arlington

APPENDIX E

SURVEY FRONTPAGE

## Survey of Independent Manufacturers



If you complete the survey, you will be entered into a drawing for one of the **five iPod Shuffles**



In the event that you win the prize, you may either keep it or we will donate an equivalent amount of money to your favorite charity upon your instructions.

*If you agree to participate in the survey, kindly click on the link below.*

Please Continue...

## APPENDIX F

### ITEM TO CONSTRUCT LOADING - FULL MODEL

Five Years Ago				Current Period				
Variable	Weight	Loading		Variable	Weight	Loading		
<b>TRUST</b>				<b>TRUST</b>				
CT1	0.1406	0.8797		CT1	0.1400	0.8781		
CT2	0.1477	0.8988		CT2	0.1431	0.8960		
CT3	0.1563	0.8339		CT3	0.1376	0.8270		
CT4	0.1449	0.8990		CT4	0.1531	0.8978		
CT5	0.1464	0.8791		CT5	0.1486	0.8840		
CT6	0.1480	0.8689		CT6	0.1580	0.8758		
CT7	0.1431	0.8683		CT7	0.1565	0.8750		
CT8	0.1479	0.6865		CT8	0.1337	0.6799		
<b>IT BUILDUP</b>				<b>IT BUILDUP</b>				
Automation				Automation				
IT2	0.3027	0.8829		IT2	0.3024	0.8826		
IT3	0.3218	0.8857		IT3	0.3195	0.8846		
IT4	0.2949	0.8141		IT4	0.2940	0.8133		
IT9	0.2789	0.7446		IT9	0.2830	0.7469		
Exchange				Exchange				
IT1	0.2278	0.7324		IT1	0.2279	0.7323		
IT5	0.2542	0.8179		IT5	0.2553	0.8182		
IT6	0.2354	0.8011		IT6	0.2319	0.7996		
IT7	0.2627	0.8441		IT7	0.2628	0.8444		
IT8	0.2609	0.8235		IT8	0.2631	0.8244		
<b>Transaction Cost (TC)</b>				<b>Transaction Cost (TC)</b>				
Monitoring				Monitoring				
TC5-4	0.3105	0.6610		TCN-4	0.2866	0.6606		
TC5-5	0.1276	0.2650	Dropped	TCN-5	0.1580	0.3514	Dropped	
TC5-6	0.3235	0.6787		TCN-6	0.2583	0.6018		
TC5-7	0.2615	0.5271	Dropped	TCN-7	0.2976	0.6784	Dropped	
TC5-8	0.3414	0.6677		TCN-8	0.3194	0.6708		
TC5-9	0.2990	0.5873	Dropped	TCN-9	0.2879	0.6377	Dropped	
Problem solving				Problem solving				
TC5-10	0.5491	0.7873		TCN-10	0.5639	0.8114		
TC5-11	0.4427	0.7849		TCN-11	0.4266	0.7662		
TC5-12	0.2959	0.4407	Dropped	TCN-12	0.2787	0.4273	Dropped	
TC5-13	0.2319	0.3872	Dropped	TCN-13	0.2454	0.3932	Dropped	
Advantage				Advantage				
TC5-14	0.1462	0.0707	Dropped	TCN-14	0.1765	0.2338	Dropped	
TC5-15	0.3591	0.8311		TCN-15	0.3526	0.8401		
TC5-16	0.4172	0.9063		TCN-16	0.3875	0.9136		
TC5-17	0.0035	-0.1847	Dropped	TCN-17	0.0067	-0.1234	Dropped	
TC5-18	0.3668	0.8554		TCN-18	0.3607	0.8576		
Effort				Effort				
TC5-1	0.4874	0.8477		TCN-1	0.4909	0.8553		
TC5-2	0.5428	0.8929		TCN-2	0.4979	0.8673		
TC5-3	0.3062	0.3336	Dropped	TCN-3	0.3344	0.4435	Dropped	

## APPENDIX G

ITEM TO CONSTRUCT LOADING - TRIMMED MODEL

5 years ago				Current		
Variable	Weight	Loading		Variable	Weight	Loading
<b>TRUST</b>				<b>TRUST</b>		
CT1	0.1418	0.8799		CT1	0.1448	0.8804
CT2	0.1464	0.8984		CT2	0.1459	0.8984
CT3	0.1529	0.8327		CT3	0.1383	0.8289
CT4	0.1461	0.8987		CT4	0.1552	0.8996
CT5	0.1490	0.8799		CT5	0.1507	0.8831
CT6	0.1461	0.8692		CT6	0.1518	0.8732
CT7	0.1441	0.8688		CT7	0.1523	0.8724
CT8	0.1481	0.6869		CT8	0.1307	0.6777
<b>IT Buildup</b>				<b>IT Buildup</b>		
Automation				Automation		
IT2	0.3035	0.8831		IT2	0.3014	0.8823
IT3	0.3210	0.8854		IT3	0.3197	0.8846
IT4	0.2946	0.8139		IT4	0.2941	0.8133
IT9	0.2793	0.7448		IT9	0.2839	0.7473
Exchange				Exchange		
IT1	0.2278	0.7324		IT1	0.2290	0.7329
IT5	0.2547	0.8180		IT5	0.2544	0.8178
IT6	0.2341	0.8006		IT6	0.2321	0.7997
IT7	0.2624	0.8441		IT7	0.2623	0.8442
IT8	0.2621	0.8239		IT8	0.2634	0.8244
<b>Transaction Cost (TC)</b>				<b>Transaction Cost (TC)</b>		
Monitoring				Monitoring		
TC5-4	0.4128	0.7976		TCN-4	0.4223	0.8043
TC5-6	0.4305	0.8492		TCN-6	0.3951	0.8075
TC5-8	0.4081	0.7477		TCN-8	0.4409	0.7740
Problem				Problem		
TC5-10	0.6309	0.9130		TCN-10	0.6241	0.9156
TC5-11	0.4960	0.8549		TCN-11	0.4966	0.8630
Advantage				Advantage		
TC5-15	0.3540	0.8477		TCN-15	0.3561	0.8599
TC5-16	0.4244	0.9090		TCN-16	0.4054	0.9230
TC5-18	0.3630	0.8655		TCN-18	0.3668	0.8712
Effort				Effort		
TC5-1	0.5319	0.9104		TCN-1	0.5453	0.9123
TC5-2	0.5607	0.9198		TCN-2	0.5499	0.9139

## APPENDIX H

### CROSS LOADINGS

5 Years Ago Cross Loadings

	TRUST	IT	TC	Automate	Exchange	Monitor	Problem	Advantage	Effort
CT1	0.88	0.21	-0.07	0.21	0.18	0.03	0.01	-0.29	0.12
CT2	0.90	0.22	-0.06	0.21	0.20	0.05	0.00	-0.28	0.12
CT3	0.83	0.22	-0.08	0.21	0.20	0.02	0.00	-0.25	0.06
CT4	0.90	0.22	-0.06	0.20	0.20	0.05	-0.01	-0.28	0.12
CT5	0.88	0.20	-0.11	0.16	0.21	0.00	-0.05	-0.28	0.07
CT6	0.87	0.19	-0.12	0.17	0.18	-0.03	-0.08	-0.25	0.07
CT7	0.87	0.18	-0.15	0.17	0.16	-0.03	-0.08	-0.29	0.05
CT8	0.69	0.20	-0.11	0.19	0.18	-0.03	-0.06	-0.20	0.02
IT1	0.15	0.69	0.03	0.56	0.73	0.01	-0.04	0.06	0.06
IT2	0.17	0.78	0.01	0.88	0.59	0.03	0.02	0.00	-0.01
IT3	0.22	0.82	0.04	0.89	0.65	0.05	0.05	0.02	0.02
IT4	0.15	0.76	-0.01	0.81	0.62	0.00	-0.04	0.02	-0.01
IT5	0.19	0.77	0.00	0.61	0.82	-0.02	-0.02	0.02	0.03
IT6	0.14	0.71	0.04	0.53	0.80	-0.05	0.04	0.07	0.06
IT7	0.22	0.80	0.10	0.61	0.84	0.08	0.10	0.01	0.10
IT8	0.19	0.80	-0.02	0.65	0.82	-0.03	0.01	-0.01	-0.01
IT9	0.20	0.72	0.01	0.74	0.59	0.04	0.00	-0.05	0.04
TC5-1	0.10	0.04	0.67	0.02	0.06	0.59	0.49	0.08	0.91
TC5-2	0.08	0.03	0.71	0.00	0.05	0.60	0.56	0.10	0.92
TC5-4	0.05	0.05	0.66	0.05	0.04	0.80	0.45	0.13	0.56
TC5-6	0.06	0.00	0.69	0.00	-0.02	0.85	0.48	0.14	0.55
TC5-8	-0.09	0.01	0.65	0.03	-0.02	0.75	0.50	0.20	0.45
TC5-10	-0.04	0.03	0.72	0.02	0.03	0.61	0.91	0.12	0.58
TC5-11	-0.02	0.00	0.57	0.00	0.01	0.43	0.85	0.06	0.42
TC5-15	-0.16	0.09	0.46	0.06	0.11	0.16	0.04	0.85	0.08
TC5-16	-0.29	-0.04	0.55	-0.06	-0.01	0.22	0.16	0.91	0.10
TC5-18	-0.36	0.01	0.47	0.01	0.01	0.14	0.08	0.87	0.08
IT2	0.17	0.78	0.01	0.88	0.59	0.03	0.02	0.00	-0.01
IT3	0.22	0.82	0.04	0.89	0.65	0.05	0.05	0.02	0.02
IT4	0.15	0.76	-0.01	0.81	0.62	0.00	-0.04	0.02	-0.01
IT9	0.20	0.72	0.01	0.74	0.59	0.04	0.00	-0.05	0.04
IT1	0.15	0.69	0.03	0.56	0.73	0.01	-0.04	0.06	0.06
IT5	0.19	0.77	0.00	0.61	0.82	-0.02	-0.02	0.02	0.03
IT6	0.14	0.71	0.04	0.53	0.80	-0.05	0.04	0.07	0.06
IT7	0.22	0.80	0.10	0.61	0.84	0.08	0.10	0.01	0.10
IT8	0.19	0.80	-0.02	0.65	0.82	-0.03	0.01	-0.01	-0.01
TC5-4	0.05	0.05	0.66	0.05	0.04	0.80	0.45	0.13	0.56
TC5-6	0.06	0.00	0.69	0.00	-0.02	0.85	0.48	0.14	0.55
TC5-8	-0.09	0.01	0.65	0.03	-0.02	0.75	0.50	0.20	0.45
TC5-10	-0.04	0.03	0.72	0.02	0.03	0.61	0.91	0.12	0.58
TC5-11	-0.02	0.00	0.57	0.00	0.01	0.43	0.85	0.06	0.42
TC5-15	-0.16	0.09	0.46	0.06	0.11	0.16	0.04	0.85	0.08
TC5-16	-0.29	-0.04	0.55	-0.06	-0.01	0.22	0.16	0.91	0.10
TC5-18	-0.36	0.01	0.47	0.01	0.01	0.14	0.08	0.87	0.08
TC5-1	0.10	0.04	0.67	0.02	0.06	0.59	0.49	0.08	0.91
TC5-2	0.08	0.03	0.71	0.00	0.05	0.60	0.56	0.10	0.92

Current Period Cross Loadings

	TRUST	IT	TC	Automate	Exchange	Monitor	Problem	Advantage	Effort
CT1	0.88	0.21	-0.50	0.21	0.18	-0.45	-0.27	-0.36	-0.47
CT2	0.90	0.22	-0.50	0.21	0.20	-0.42	-0.30	-0.36	-0.46
CT3	0.83	0.22	-0.47	0.21	0.20	-0.37	-0.31	-0.31	-0.47
CT4	0.90	0.22	-0.54	0.20	0.20	-0.42	-0.35	-0.40	-0.49
CT5	0.88	0.21	-0.53	0.16	0.21	-0.43	-0.34	-0.38	-0.47
CT6	0.87	0.19	-0.54	0.17	0.18	-0.44	-0.36	-0.38	-0.47
CT7	0.87	0.18	-0.55	0.17	0.16	-0.45	-0.35	-0.40	-0.47
CT8	0.68	0.20	-0.45	0.19	0.18	-0.42	-0.31	-0.28	-0.38
IT1	0.15	0.70	-0.14	0.56	0.73	-0.21	-0.18	0.08	-0.17
IT2	0.17	0.77	-0.10	0.88	0.60	-0.14	-0.12	0.04	-0.12
IT3	0.22	0.81	-0.11	0.88	0.65	-0.15	-0.13	0.03	-0.13
IT4	0.15	0.75	-0.10	0.81	0.62	-0.14	-0.19	0.06	-0.09
IT5	0.19	0.78	-0.12	0.61	0.82	-0.16	-0.16	0.02	-0.11
IT6	0.14	0.71	-0.07	0.53	0.80	-0.16	-0.05	0.06	-0.09
IT7	0.22	0.80	-0.14	0.61	0.84	-0.17	-0.14	-0.02	-0.14
IT8	0.19	0.81	-0.16	0.65	0.82	-0.20	-0.15	0.02	-0.19
IT9	0.20	0.72	-0.17	0.75	0.59	-0.17	-0.15	-0.07	-0.15
TCN-1	-0.49	-0.18	0.74	-0.15	-0.18	0.65	0.52	0.28	0.91
TCN-2	-0.50	-0.14	0.74	-0.12	-0.14	0.63	0.55	0.30	0.91
TCN-4	-0.40	-0.12	0.68	-0.10	-0.12	0.80	0.41	0.29	0.58
TCN-6	-0.33	-0.24	0.63	-0.18	-0.26	0.81	0.45	0.20	0.52
TCN-8	-0.45	-0.16	0.71	-0.14	-0.16	0.77	0.48	0.36	0.57
TCN-10	-0.39	-0.15	0.72	-0.15	-0.13	0.57	0.92	0.27	0.57
TCN-11	-0.27	-0.19	0.57	-0.17	-0.18	0.41	0.86	0.17	0.46
TCN-15	-0.30	0.06	0.57	0.04	0.08	0.30	0.20	0.86	0.25
TCN-16	-0.39	-0.03	0.65	-0.04	-0.01	0.36	0.25	0.92	0.31
TCN-18	-0.42	0.04	0.59	0.05	0.03	0.30	0.22	0.87	0.27
IT2	0.17	0.77	-0.10	0.88	0.60	-0.14	-0.12	0.04	-0.12
IT3	0.22	0.81	-0.11	0.88	0.65	-0.15	-0.13	0.03	-0.13
IT4	0.15	0.75	-0.10	0.81	0.62	-0.14	-0.19	0.06	-0.09
IT9	0.20	0.72	-0.17	0.75	0.59	-0.17	-0.15	-0.07	-0.15
IT1	0.15	0.70	-0.14	0.56	0.73	-0.21	-0.18	0.08	-0.17
IT5	0.19	0.78	-0.12	0.61	0.82	-0.16	-0.16	0.02	-0.11
IT6	0.14	0.71	-0.07	0.53	0.80	-0.16	-0.05	0.06	-0.09
IT7	0.22	0.80	-0.14	0.61	0.84	-0.17	-0.14	-0.02	-0.14
IT8	0.19	0.81	-0.16	0.65	0.82	-0.20	-0.15	0.02	-0.19
TCN-4	-0.40	-0.12	0.68	-0.10	-0.12	0.80	0.41	0.29	0.58
TCN-6	-0.33	-0.24	0.63	-0.18	-0.26	0.81	0.45	0.20	0.52
TCN-8	-0.45	-0.16	0.71	-0.14	-0.16	0.77	0.48	0.36	0.57
TCN-10	-0.39	-0.15	0.72	-0.15	-0.13	0.57	0.92	0.27	0.57
TCN-11	-0.27	-0.19	0.57	-0.17	-0.18	0.41	0.86	0.17	0.46
TCN-15	-0.30	0.06	0.57	0.04	0.08	0.30	0.20	0.86	0.25
TCN-16	-0.39	-0.03	0.65	-0.04	-0.01	0.36	0.25	0.92	0.31
TCN-18	-0.42	0.04	0.59	0.05	0.03	0.30	0.22	0.87	0.27
TCN-1	-0.49	-0.18	0.74	-0.15	-0.18	0.65	0.52	0.28	0.91
TCN-2	-0.50	-0.14	0.74	-0.12	-0.14	0.63	0.55	0.30	0.91

## REFERENCES

1. Allen, F. and Gale, D. Innovations in Financial Services, Relationships, and Risk Sharing. *Management Science*, 45 (9). 1239-1253.
2. Argyres, N.S. and Liebeskind, J.P. Contractual Commitments, Bargaining Power, and Governance Inseparability: Incorporating History into Transaction Cost Theory. *Academy of Management Review*, 24 (1). 49-63.
3. Armstrong, J.S. and Overton, T.S. Estimating Nonresponse Bias in Mail Surveys. *Journal of Marketing Research (JMR)*, 14 (3). 396-402.
4. Artz, K.W. Buyer-Supplier Performance: The Role of Asset Specificity, Reciprocal Investments and Relational Exchange. *British Journal of Management*, 10 (2). 113-127.
5. Bachmann, D., Elfrink, J. and Vazzana, G. Tracking the progress of E-mail vs. snail-mail. *Marketing Research*, 8 (2). 30-35.
6. Bakos, J.Y. Information Links and Electronic Marketplaces: The Role of Interorganizational Information Systems in Vertical Markets. *Journal of Management Information Systems*, 8 (2). 31-52.
7. Bakos, J.Y. and Brynjolfsson, E. Information Technology, Incentives, and the Optimal Number of Suppliers. *Journal of Management Information Systems*, 10 (2). 37-53.
8. Bakos, J.Y. and Treacy, M.E. Information Technology and Corporate Strategy: A Research Perspective. *MIS Quarterly*, 10 (2). 107-119.
9. Barney, J. Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17 (1). 99-120.
10. Baron, R.M. and Kenny, D.A. The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. *Journal of Personality And Social Psychology*, 51 (6). 1173-1182.
11. Baum, J.A.C., Calabrese, T. and Silverman, B.S. Don't Go It Alone: Alliance Network Composition and Startups' Performance in Canadian Biotechnology. *Strategic Management Journal*, 21 (3). 267-294.
12. Beccerra, M. and Gupta, A.K. Trust Within the Organization: Integrating the Trust Literature with Agency Theory and Transaction Cost Economics. *Public Administration Quarterly*, 23 (2). 177-204.
13. Bensaou, B.M. What are the Dynamic Forces Behind Partnerships? *The Business Link*. 6-16.
14. Bensaou, M. Portfolios of Buyer-Supplier Relationships. *Sloan Management Review*, 40 (4). 35-44.
15. Bensaou, M. and Earl, M. The Right Mind-set for Managing Information Technology. *Harvard Business Review*, 76 (5). 118-128.

16. Bergeron, F. and Raymond, L. Planning of Information Systems to Gain a Competitive Edge. *Journal of Small Business Management*, 30 (1). 21-27.
17. Bharadwaj, A.S. A Resource-based Perspective on Information Technology Capability and Firm Performance: An Empirical Investigation. *MIS Quarterly*, 24 (1). 169-196.
18. Bharadwaj, A.S., Bharadwaj, S.G. and Konsynski, B.R. The Moderator Role of Information Technology in Firm Performance: A Conceptual Model and Research Propositions. *International Conference on Information Systems*. 183-188.
19. Bharadwaj, A.S., Sambamurthy, V. and Zmud, R.W. IT Capabilities: Theoretical Perspectives and Empirical Operationalization. *Proceedings of the 20th International Conference on Information Systems*. 378-385.
20. Bhattacharjee, A. Individual Trust in Online Firms: Scale Development and Initial Test. *Journal of Management Information Systems*, 19 (1). 211-241.
21. Blau, P.M. *Exchange and Power in Social Life*. J. Wiley, New York, 1964.
22. Brown, J.R., Dev, C.S. and Lee, D.-J. Managing Marketing Channel Opportunism: The Efficacy of Alternative Governance Mechanisms. *Journal of Marketing*, 64 (2). 51-65.
23. Brown, W.J., Dobson, A.J. and Mishra, G. What Is a Healthy Weight for Middle Aged Women? *International Journal of Obesity*, 22 (6). 520-529.
24. Brynjolfsson, E., Malone, T.W., Gurbaxani, V. and Kambil, A. Does Information Technology Lead to Smaller Firms? *Management Science*, 40 (12). 1628-1643.
25. Burke, G.L., Arnold, A.M., Bild, D.E., Cushman, M., Fried, L.P., Newman, A., Nunn, C. and Robbins, J. Factors Associated with Healthy Aging: The Cardiovascular Health Study. *Journal of the American Geriatrics Society*, 49 (3). 254-262.
26. Cash, J.I. and Konsynski, B.R. IS Redraws Competitive Boundaries. *Harvard Business Review*, 63 (2). 134-142.
27. Chan, Y.E., Huff, S.L., Barclay, D.W. and Copeland, D.G. Business Strategic Orientation, Information Systems Strategic Orientation, and Strategic Alignment. *Information Systems Research*, 8 (2). 125-151.
28. Chang, L. and Powell, P. Towards a Framework for Business Process Re-engineering in Small and Medium-sized Enterprises. *Information Systems Journal*, 8 (3). 199-215.
29. Chen, H. and Chen, T.-J. Asymmetric strategic alliances: A network view. *Journal of Business Research*, 55 (12). 1007-1013.
30. Chen, H. and Chen, T.-J. Governance Structures in Strategic Alliances: Transaction Cost Versus Resource-based Perspective. *Journal of World Business*, 38 (1). 1-15.
31. Chin, W.W. Commentary: Issues and Opinion on Structural Equation Modeling. *MIS Quarterly*, 22 (1). vii-xvi.
32. Claro, D.P., Hagelaar, G. and Omta, O. The Determinants of Relational Governance and Performance: How to Manage Business Relationships? *Industrial Marketing Management*, 32 (8). 703-717.

33. Clemons, E.K., Reddi, S.P. and Row, M.C. The Impact of Information Technology on the Organization of Economic Activity: The 'Move to the Middle' Hypothesis. *Journal of Management Information Systems*, 10 (2). 9-35.
34. Clemons, E.K. and Row, M.C. Information Technology and Industrial Cooperation: The Changing Economics of Coordination and Ownership. *Journal of Management Information Systems*, 9 (2). 9-28.
35. Coderre, F.o., St-Laurent, N. and Mathieu, A. Comparison of the quality of qualitative data obtained through telephone, postal and email surveys. *International Journal of Market Research*, 46 (3). 347-357.
36. Combs, J.G. and Ketchen Jr., D.J. Explaining Interfirm Cooperation and Performance: Toward a Reconciliation of Predictions from the Resource-based View and Organizational Economics. *Strategic Management Journal*, 20 (9). 867-888.
37. Curran, P.J., Bollen, K.A., Paxton, P., Kirby, J. and Chen, F. The Noncentral Chi-square Distribution in Misspecified Structural Equation Models: Finite Sample Results from a Monte Carlo Simulation. *Multivariate Behavioral Research*, 37 (1). 1-36.
38. Dahlstrom, R. and Nygaard, A. An Empirical Investigation of Ex Post Transaction Costs in Franchised Distribution Channels. *Journal of Marketing Research*, 36 (2). 160.
39. Das, T.K. and Teng, B.-S. Alliance Constellations: A Social Exchange Perspective. *Academy of Management Review*, 27 (3). 445-456.
40. Das, T.K. and Teng, B. A Resource-Based Theory of Strategic Alliances. *Journal of Management*, 26 (1). 31-61.
41. Dedrick, J., Gurbaxani, V. and Kraemer, K.L. Information Technology and Economic Performance: A Critical Review of the Empirical Evidence. *ACM Computing Surveys*, 35 (1). 1-28.
42. DeLone, W.H. Firm Size and the Characteristics of Computer Use. *MIS Quarterly*, 5 (4). 65-71.
43. Dewan, S., Michael, S.C. and Min, C.-K. Firm Characteristics and Investments in Information Technology: Scale and Scope Effects. *Information Systems Research*, 9 (3). 219-232.
44. Dirks, K.T. and Ferrin, D.L. The Role of Trust in Organizational Settings. *Organization Science*, 12 (4). 450-467.
45. Dollinger, M.J. Measuring Effectiveness in Entrepreneurial Organization. *International Small Business Journal*, 3 (1). 10-20.
46. Doney, P.M. and Cannon, J.P. An Examination of the Nature of Trust in Buyer-seller Relationships. *Journal of Marketing*, 61 (2). 35-52.
47. Dwyer, F.R., Schurr, P.H. and Oh, S. Developing Buyer-Seller Relationships. *Journal of Marketing*, 51 (2). 11-27.
48. Dwyer, F.R. and Sejo, O. A Transaction Cost Perspective on Vertical Contractual Structure and Interchannel Competitive Strategies. *Journal of Marketing*, 52 (2). 21-35.

49. Dyer, J.H. Does Governance Matter? Keiretsu Alliances and Asset Specificity as Sources of Japanese Competitive Advantage. *Organization Science*, 7 (6). 649-666.
50. Dyer, J.H. Effective Interfirm Collaboration: How Firms Minimize Transaction Costs and Maximize Transaction Value. *Strategic Management Journal*, 18 (7). 535-556.
51. Dyer, J.H. Specialized Supplier Networks as a Source of Competitive Advantage: Evidence from the Auto Industry. *Strategic Management Journal*, 17. 271-291.
52. Dyer, J.H. and Singh, H. The Relational View: Cooperative Strategy and Sources of Interorganizational Competitive Advantage. *Academy of Management Review*, 23 (4). 660-679.
53. Eisenhardt, K.M. and Schoonhoven, C.B. Resource-based View of Strategic Alliance Formation: Strategic and Social Effects in Entrepreneurial Firms. *Organization Science*, 7 (2). 136.
54. Fuchs, R. Causal Models of Physical Exercise Participation: Testing the Predictive Power of the Construct "Pressure to Change". *Journal of Applied Social Psychology*, 26 (21). 1931-1960.
55. Ganesh, J., Madanmohan, T.R., Jose, P.D. and Seshadri, S. Adaptive Strategies of Firms in High-Velocity Environments: The Case of B2B Electronic Marketplaces. *Journal of Global Information Management*, 12 (1). 41-59.
56. Gefen, D. E-commerce: The Role of Familiarity and Trust. *Omega: The International Journal of Management Science*, 28 (6). 725-737.
57. Gefen, D., Straub, D. and Boudreau, M.-C. Structural Equation Modeling and Regression: Guidelines for Research Practice. *Communications of AIS*, 4 (7). 1-77.
58. Ghosh, M. and John, G. Governance Value Analysis and Marketing Strategy. *Journal of Marketing*, 63 (4). 131.
59. Grandon, E. and Pearson, J.M. E-commerce Adoption: Perceptions of Managers/Owners of Small and Medium Sized Firms in Chile. *Communications of the ACM*, 13. 81-102.
60. Grover, V. and Malhotra, M.K. Transaction Cost Framework in Operations and Supply Chain Management Research: Theory and Measurement. *Journal of Operations Management*, 21 (4). 457-474.
61. Grover, V. and Malhotra, M.K. Transaction Cost Framework in Operations and Supply Chain Management Research: Theory and Measurement. *Journal of Operations Management*, 21 (4). 457-473.
62. Grover, V. and Ramanlal, P. Six Myths of Information and Markets: Information Technology Networks, Electronic Commerce, and the Battle for Consumer Surplus. *MIS Quarterly*, 23 (4). 465-495.
63. Grover, V., Teng, J.T.C. and Fiedler, K.D. Investigating the Role of Information Technology in Building Buyer-supplier Relationships. *Journal of the Association for Information Systems*, 3. 217-245.
64. Gupta, U.G. and Capen, M. An Empirical Investigation of the Contribution of IS to Manufacturing Productivity. *Information & Management*, 31 (1). 227-233.

65. Gurbaxani, V. and Whang, S. The Impact of Information Systems on Organizations and Markets. *Communications of the ACM*, 34 (1). 59-73.
66. Haenlein, M. and Kaplan, A.M. A Beginner's Guide to Partial Least Squares Analysis. *Understanding Statistics*, 3 (4). 283-297.
67. Hagel III, J. Leveraged Growth: Expanding Sales Without Sacrificing Profits. *Harvard Business Review*, 80 (10). 68-77.
68. Hair, J.F.J., Black, W.C., Babin, B.J., Anderson, R.E. and Tatham, R.L. *Multivariate Data Analysis*. Pearson Education, Upper Saddle River, NJ, 2005.
69. Harrison, D.A., Mykytyn Jr, P.P. and Riemenschneider, C.K. Executive Decisions about Adoption of Information Technology in Small Business: Theory and Empirical Tests. *Information Systems Research*, 8 (2). 171-195.
70. Heide, J.B. Interorganizational governance in marketing channels. *Journal of Marketing*, 58 (1). 71-85.
71. Heide, J.B. and John, G. Alliances in Industrial Purchasing: The Determinants of Joint Action in Buyer-supplier Relationships. *Journal of Marketing Research*, 27 (1). 24-36.
72. Hite, J.M. and Hesterly, W.S. The Evolution of Firm Networks: From Emergence to Early Growth of the Firm. *Strategic Management Journal*, 22 (3). 275-286.
73. Hitt, L.M. Information Technology and Firm Boundaries: Evidence from Panel Data. *Information Systems Research*, 10 (2). 134-149.
74. Homans, G.C. and Merton, R.K. *Social Behavior: Its Elementary Forms*. Under the General Editorship of Robert K. Merton. Harcourt Brace & World, New York, 1961.
75. Hussin, H., King, M. and Cragg, P. IT Alignment in Small Firms. *European Journal of Information Systems*, 11 (2). 108-127.
76. Iacovou, C.L. and Benbasat, I. Electronic Data Interchange and Small Organizations: Adoption and Impact of Technology. *MIS Quarterly*, 19 (4). 465-486.
77. Inkpen, A.C. and Dinur, A. Knowledge management processes and international joint ventures. *Organization Science*, 9 (4). 454.
78. Jap, S.D. and Anderson, E. Safeguarding Interorganizational Performance and Continuity Under Ex Post Opportunism. *Management Science*, 49 (12). 1684-1701.
79. Jarvenpaa, S.L. and Tractinsky, N. Consumer Trust in an Internet Store: A Cross-cultural Validation. *Journal of Computer Mediated Communication*, 5 (2). 1-35.
80. Johnston, R. and Lawrence, P.R. Beyond Vertical Integration - the Rise of the Value-adding Partnership. *Harvard Business Review*, 66 (4). 94-101.
81. Joshi, A.W. and Stump, R.L. Determinants of Commitment and Opportunism: Integrating and Extending Insights from Transaction Cost Analysis and Relational Exchange Theory. *Canadian Journal of Administrative Sciences*, 16 (4). 334-352.
82. Kagan, A. and Lau, K. Information System Usage within Small Business Firms. *Entrepreneurship: Theory & Practice*, 14 (3). 25-38.

83. Kale, P., Singh, H. and Perlmutter, H. Learning and Protection of Proprietary Assets in Strategic Alliances: Building Relational Capital. *Strategic Management Journal*, 21 (3). 217-237.
84. Kearns, G.S. and Lederer, A.L. A Resource-Based View of Strategic IT Alignment: How Knowledge Sharing Creates Competitive Advantage. *Decision Sciences*, 34 (1). 1-30.
85. Khazanchi, D. and Sutton, S.G. Assurance Services for Business-to-business Electronic Commerce: A Framework and Implication. *Journal of the Association for Information Systems*, 1 (11). 1-53.
86. Kochhar, R. Explaining Firm Capital Structure: The Role of Agency Theory vs. Transaction Cost Economics. *Strategic Management Journal*, 17 (9). 713-729.
87. Konsynski, B.R. and McFarlan, F.W. Information Partnerships - Shared Data, Shared Scale. *Harvard Business Review*, 68 (5). 114-120.
88. Kotabe, M., Martin, X. and Domoto, H. Gaining from Vertical Partnerships: Knowledge Transfer, Relationship Duration and Supplier Performance Improvement in the U.S. and Japanese Automotive Industries. *Strategic Management Journal*, 24 (4). 293-316.
89. Kumar, K. and van Dissel, H.G. Sustainable Collaboration: Managing Conflict and Cooperation in Interorganizational Systems. *MIS Quarterly*, 20 (3). 279-300.
90. Lambert, D.M. and Harrington, T.C. Measuring Nonresponse Bias in Customer Service Mail Surveys. *Journal of Business Logistics*, 11 (2). 5-25.
91. Lee, H.L., So, K.C. and Tang, C.S. The Value of Information Sharing in a Two-Level Supply Chain. *Management Science*, 46 (5). 626-643.
92. Li, L. and Ng, P. Market Exchanges, Hierarchical Exchanges or Relational Exchanges in Export Channels into Emerging Markets. *International Business Review*, 11 (6). 707-723.
93. Lorenzoni, G. and Lipparini, A. The Leveraging of Interfirm Relationships as a Distinctive Organizational Capability: A Longitudinal Study. *Strategic Management Journal*, 20 (4). 317-338.
94. Macneil, I.R. *The New Social Contract: An Inquiry into Modern Contractual Relations*. Yale University Press, New Haven, 1980.
95. Malone, T.W. Modeling Coordination in Organizations and Markets. *Management Science*, 33 (10). 1317-1332.
96. Malone, T.W., Yates, J. and Benjamin, R.I. Electronic Markets and Electronic Hierarchies. *Communications of the ACM*, 30 (6). 484-497.
97. Marcoulides, G.A. and Saunders, C. PLS: A Silver Bullet? *MIS Quarterly*, 30 (2). 1-1.
98. Marcus, B.H., Eaton, C.A., Rossi, J.S. and Harlow, L.L. Self-Efficacy, Decision-Making, and Stages of Change: An Integrative Model of Physical Exercise. *Journal of Applied Social Psychology*, 24 (6). 489-508.
99. Mata, F.J., Fuerst, W.L. and Barney, J.B. Information Technology and Sustained Competitive Advantage: A Resource-based Analysis. *MIS Quarterly*, 19 (4). 487-506.
100. Melville, N., Kraemer, K. and Gurbaxani, V. Review: Information Technology and Organizational Performance: An Integrative Model of IT Business Value. *MIS Quarterly*, 28 (2). 283-322.

101. Mo-suwan, L., Tongkumchum, P. and Puetpaiboon, A. Determinants of Overweight Tracking from Childhood to Adolescence: A 5-year Follow-up Study of Hat Yai Schoolchildren. *International Journal of Obesity*, 24 (12). 1642-1648.
102. Monczka, R.M., Petersen, K.J., Handfield, R.B. and Ragatz, G.L. Success Factors in Strategic Supplier Alliances: The Buying Company Perspective. *Decision Sciences*, 29 (3). 553-577.
103. Muthusamy, S.K. and White, M.A. Learning and Knowledge Transfer in Strategic Alliances: A Social Exchange View. *Organization Studies*, 26. 415.
104. Nooteboom, B. Trust, Opportunism and Governance: A Process and Control Model. *Organization Studies*, 17 (6). 985-1011.
105. Nooteboom, B., Berger, H. and Erhagen, N.G. Effects of Trust and Governance on Relational Risk. *Academy of Management Journal*, 40 (2). 308-339.
106. Nunnally, J.C. *Psychometric Theory*. McGraw-Hill, New York, NY, 1967.
107. Paffenbarger, R.S. and Lee, I.M. A Natural History of Athleticism, Health and Longevity. *Journal of Sports Sciences*, 16 (4). 31-45.
108. Parkhe, A. Strategic Alliance Structuring: A Game Theoretic and Transaction Cost Examination of Interfirm Cooperation. *Academy of Management Journal*, 36 (4). 794-829.
109. Pfeffer, J. and Salancik, G.R. *The External Control of Organizations: A Resource Dependence Perspective*. Harper & Row, New York, 1978.
110. Pflughoeft, K.A., Ramamurthy, K., Soofi, E.S., Yasai-Ardekani, M. and Zahedi, F.M. Multiple Conceptualizations of Small Business Web Use and Benefit. *Decision Sciences*, 34 (3). 467-512.
111. Pilling, B.K., Crosby, L.A. and Jackson Jr, D.W. Relational Bonds in Industrial Exchange: An Experimental Test of the Transaction Cost Economic Framework. *Journal of Business Research*, 30 (3). 237-251.
112. Poppo, L. and Zenger, T. Do Formal Contracts and Relational Governance Function as Substitutes or Complements? *Strategic Management Journal*, 23 (8). 707-725.
113. Porter, M.E. and Millar, V.E. How Information Gives You Competitive Advantage. *Harvard Business Review*, 63 (4). 148-160.
114. Premkumar, G. and Ramamurthy, K. The Role of Interorganizational and Organizational Factors on the Decision Mode for Adoption of Interorganizational Systems. *Decision Sciences*, 26 (3). 303-336.
115. Raymond, L. Organizational Characteristics and MIS Success in the Context of Small Business. *MIS Quarterly*, 9 (1). 37-52.
116. Reich, B.H. and Benbasat, I. Measuring the linkage between business and information technology objectives. *MIS Quarterly*, 20 (1). 55.
117. Riemenschneider, C.K. and McKinney, V. Exploring Beliefs Regarding E-commerce: What Do Small Business Executives Think? *Decision Line*. 10-12.
118. Ring, P.S. Fragile and Resilient Trust and Their Roles in Economic Exchange. *Business & Society*, 35 (2). 148-176.
119. Ring, P.S. and van de Ven, A.H. Structuring Cooperative Relationships between Organizations. *Strategic Management Journal*, 13 (7). 483-499.

120. Rogers, M. Networks, Firm Size and Innovation. *Small Business Economics*, 22 (2). 141-153.
121. Sanders, N.R. and Premus, R. Modeling the Relationship between Firm IT Capability, Collaboration, and Performance. *Journal of Business Logistics*, 26 (1). 1-23.
122. Sarkar, M., Echambadi, R. and Harrison, J.S. Alliance Entrepreneurship and Firm Market Performance. *Strategic Management Journal*, 22 (6/7). 701-711.
123. SBA. Small Business by the Numbers. Administration, S.B. ed., SBA Office of Advocacy, 2002.
124. SBA, D.o. Table of Small Business Size Standards Matched to North American Industry Classification System Codes. Office, S.G.C. ed., U.S. Small Business Administration, 2004, 1-35.
125. Sheth, J.N. and Shah, R.H. Till Death Do Us Part.but Not Always: Six Antecedents to a Customer's Relational Preference in Buyer-seller Exchanges. *Industrial Marketing Management*, 32 (8). 627-632.
126. Sircar, S., Turnbow, J.L. and Bordoloi, B. A Framework for Assessing the Relationship Between Information Technology Investments and Firm Performance. *Journal of Management Information Systems*, 16 (4). 69-97.
127. Spekman, R.E. Strategic Supplier Selection: Understanding Long-term Buyer Relationships. *Business Horizons*, 31 (4). 75-81.
128. Straub, D., Boudreau, M.-C. and Gefen, D. Validation Guidelines for IS Positivist Research. *Communications of AIS*, 2004 (13). 380-427.
129. Stuart, T.E. Interorganizational Alliances and the Performance of Firms: A Study of Growth and Innovation Rates in a High-technology Industry. *Strategic Management Journal*, 21 (8). 791-811.
130. Subramani, M. How Do Suppliers Benefit from Information Technology Use in Supply Chain Relationships? *MIS Quarterly*, 28 (1). 45-74.
131. Tapscott, D. Rethinking Strategy in a Networked World. *Strategy & Business*, 24. 1-8.
132. Thong, J.Y.L. An Integrated Model of Information Systems Adoption in Small Business. *Journal of Management Information Systems*, 15 (4). 187-215.
133. Trienekens, J.H. and Beulens, A.J.M. Views on Inter-enterprise Relationships. *Production Planning & Control*, 12 (5). 466-477.
134. Tsang, E.W.K. Transaction Cost and Resource-based Explanations of Joint Ventures: A Comparison and Synthesis. *Organization Studies*, 21 (1). 215-243.
135. Uzzi, B. and Lancaster, R. Relational Embeddedness and Learning: The Case of Bank Loan Managers and Their Clients. *Management Science*, 49 (4). 383-399.
136. Venkatraman, N. and Henderson, J.C. Real Strategies for Virtual Organizing. *Sloan Management Review*, 40 (1). 33-48.
137. Wang, S. Impact of Information Technology on Organizations. *Human Systems Management*, 16 (2). 83-91.
138. Wathne, K.H., Biong, H. and Heide, J.B. Choice of Supplier in Embedded Markets: Relationship and Marketing Program Effects. *Journal of Marketing*, 65 (2). 54-66.

139. Williamson, O.E. *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*. Free Press; Collier Macmillan, New York, London, 1985.
140. Williamson, O.E. Transaction-cost Economics: The Governance of Contractual Relations. *Journal of Law and Economics*, 22. 233-263.
141. Winger, A.R. Is Big Really Bad? *Business Economics*, 29 (3). 38-43.
142. Yasuda, H. Formation of Strategic Alliances in High-technology Industries: Comparative Study of the Resource-based Theory and the Transaction-cost Theory. *Technovation*, 25 (7). 763-771.
143. Yli-Renko, H., Autio, E. and Sapienza, H.J. Social Capital, Knowledge Acquisition, and Knowledge Exploitation in Young Technology-based Firms. *Strategic Management Journal*, 22 (6/7). 587-613.
144. Young-Ybarra, C. and Wiersema, M. Strategic Flexibility in Information Technology Alliances: The Influence of Transaction Cost Economics and Social Exchange Theory. *Organization Science*, 10. 439-460.
145. Zaheer, A., McEvily, B. and Perrone, V. Does Trust Matter? Exploring the Effects of Interorganizational and Interpersonal Trust on Performance. *Organization Science*, 9 (2). 141-159.
146. Zaheer, A. and Venkatraman, N. Relational Governance as an Interorganizational Strategy: An Empirical Test of the Role of Trust in Economic Exchange. *Strategic Management Journal*, 16 (5). 373-393.

## BIOGRAPHICAL INFORMATION

William W. Willette holds a Bachelors degree in English from Texas A&M University at Corpus Christi. He also earned a MBA-Management from the same institution. He has over 25 years of experience as a business owner and entrepreneur. He has done business consulting and has taught at the university level for several years before joining the doctoral program at the Univerisity of Texas at Arlington. His goal is to combine his business experience and research skills to make contributions to the relevancy of academic research.