

INTEGRATION OF ELECTRONIC COMMERCE NETWORKS INTO THE SALES PROCESSES OF SMALL FIRMS

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ABSTRACT

This study concerns the integration of electronic commerce networks into the “sales” processes of small firms. Specifically, this study focuses on integration of an electronic commerce (EC) network in those business processes leading up to an actual sales order. We examined seventeen small firms at the end of their first year of participation in an inter-organizational electronic network that matches procurement bids of large firm buyers with smaller firm suppliers. It was found that a firm's capacity to perceive EC networking benefits had the strongest influence on the degree of integration. In particular, expected searching, communication and labor costs benefits were indicators of EC network integration within sales activities. Unlike previous research, this study attempts to better characterize the dynamics of integration by recognizing integration as a process rather than a discrete event or point in time. To accommodate this approach the authors introduce the Customer-Supplier Life Cycle Framework that extends the customer business process perspective proposed by Ives and Learmonth (1984) in their Customer Resource Life Cycle (CRLC). The Customer-Supplier Life Cycle Framework offers promise as a research perspective and managerial tool to help further identify integration opportunities and impact.

Keywords: Electronic Commerce Networks, Integration; Small Firms; Customer Supplier Life Cycle; Model of Electronic Commerce Network Integration

1. Introduction

Network-based business opportunities are proliferating as Information Technology (IT) allows firms to more efficiently match customers and suppliers. This is particularly true for small firms seeking to leverage niche expertise and specialized production capability. Electronic Commerce (EC) networks permit buyers and suppliers to directly interact electronically; requiring firms to adapt their businesses processes to a new paradigm where buyers and suppliers actively seek each other out (sales) and consummate the business transaction (post-sales) entirely by electronic means. In theory, such electronic buyer and supplier networks give small firms a better opportunity to compete with resource rich, and geographically diverse, large firms. However, before firms can fully participate in electronic markets, they must establish fundamental information linkages and alter their activities to adjust to new ways of conducting business (Young and Johnston, 2003). To better understand these links, researchers must investigate the extent to which small firms are actually modifying their business processes to accommodate network-based buying and selling.

Past research has focused on the benefits of “post-sales” electronic network technology (Senn, 1998) (Hanna and Walsh, 2002). It has also been found that the adoption of post-sales network technology, principally Electronic Data Interchange (EDI) and Electronic Funds Transfer (EFT), are often reactive responses to large buyers' coercive demands (Young et al., 1999) (Tan and Thoen, 2000). Interestingly, the Information Systems (IS) literature has somewhat ignored the contribution of interorganizational networks to sales (processes up to the order) related business processes. EC networks employed at the beginning of the sales process may be used as a proactive means for a firm to identify new buyers and share information. While the popular press expounds Internet-based sales strategies and technological solutions, many small firms have not fully integrated EC network technologies to create sales opportunities because they lack technical knowledge, financial resources, training, and an understanding of

how the technology might best be applied. Thus, our exploratory study addresses the question: *Which factors influence the integration of Electronic Commerce Networks in the sales processes of small firms?*

To address this question, a research model is introduced to guide a qualitative investigation of factors influencing the integration of electronic commerce networks in the sales processes of 17 small firms. Unlike previous research, this study attempts to better characterize the dynamics of integration by emphasizing integration as a process rather than a discrete event or point in time. To accommodate this approach we introduce a model that extends the customer business process perspective proposed by Ives and Learmonth (1984) in their classic Customer Resource Life Cycle (CRLC) model. The paper is organized as follows: The Research Model is introduced. Next, we develop our propositions, discuss the Customer-Supplier Life Cycle Framework and then present our research approach. Finally, we discuss our research results and implications for research and practice.

2. Electronic Commerce Networks And The Small Firm

We define an electronic commerce network as an inter-organizational system that allows participating buyers and sellers to exchange information about prices and product offerings (Bakos, 1991). Electronic commerce networks allow buyers and suppliers to take joint action (Heide and John, 1990) in order to interact in a way that penetrates organizational boundaries contrary to traditional buyer-supplier responsibilities. EC networks tend to create relationships that allow verification of supplier qualifications and examination of supplier manufacturing methods, production capability, personnel and technological capabilities (Hanna and Walsh, 2002).

Small firms, offer a special case in forming inter-organizational relationships and in choosing appropriate sales channels (Carson and Cromie, 1990). To gain competitive advantages, small firms may seek to join or establish inter-organizational EC networks. For example, members of the motorcycle component parts industry in northern Italy participate in an EC network that links large buyers and small firm suppliers together to reduce costs (Muffatto and Panizzolo, 1996). There is some evidence that smaller, tighter networks of suppliers enjoy non-contractible benefits such as innovation, quality, information exchange, trust, flexibility and responsiveness (Kumar and van Dissel, 1996). Typically firms considering participation in an EC network weigh the relative advantages and disadvantages of participation, make the decision to participate or not, and, over time, integrate the necessary business practices and technology to take advantage of its potential (Grover and Teng, 2001). Thus, past literature seems to suggest that competitive opportunities exist for small firms in the era of EC networks if they recognize the benefits of networking and can effectively form alliances that identify and nurture buyer-seller relationships.

Network alliances are evolutionary, multifaceted, institutions that grow out of numerous economic and political initiatives (Osborn and Hagedoorn 1997; Schutjens and Stam, 2003). In one U.S. state government initiative, the Business Gateway (BG) was formed as a non-profit organization that offered small businesses an Internet-based transaction system that matched buyers with suppliers. Specifically, this value-added network (VAN) assisted firms in identifying government and private sector procurement bids and allowed suppliers to bid on-line. Firms add innovations, such the Business Gateway, to their business processes through a three-step process of initiation, adoption and integration (Kwon and Zmud, 1987). Initiation includes pressures to change, the gathering of information, and the evaluation of information culminating in adoption (Grover and Goslar, 1993). Adoption involves the decision to commit resources to the innovation. Integration involves the implementation of the innovation and corresponding modification of business processes to maximize its use (Cooper and Zmud, 1990).

We define adoption as the decision to join and commit resources to a network alliance. Integration is the process during which a firm alters its sales practices and applications so that they interface with the information links of an EC network. Because the integration concept in this study is process-based, our integration measure is inclusive of aspects of both internal and external integration. In the context of this study, internal integration refers to integration of EC networks into sales processes with the firm and external integration refers to the process-based information links to external trading partners. Furthermore, this paper examines firms after the decision to adopt EC has been made and as they are actively integrating an EC network into their business processes.

3. EC Network Integration Model

Past MIS literature has focused primarily on post-sale relationships between buyers and suppliers as implemented through such technologies as EDI or Electronic Funds Transfer (EFT) (Chatfield and Yetton, 2000; Williams and Frolick, 2001). As mentioned earlier, one focus of this "post-sales" research has been the strategic dependence of small firm suppliers to powerful, large customers, that dictate the adoption and integration of IT to facilitate the customer's product ordering, delivery, and payment. However, little research has emphasized the potential of electronic networks as a proactive initiative by small firms to enhance their revenue generating power or

to open new channels in their "pre-order or sales" processes (Beatty et al., 2001). Our research focuses on the integration of the EC network in these sale processes in small firms.

The Network Integration Model, Figure 1, examines how four concepts influence the integration of EC networks in the sales processes of small firms. These concepts are *Expected Benefits* (capability to improve the customer base and increase internal efficiencies), *Organizational Readiness* (the availability of technological and financial resources necessary to integrate EC networks), *External Pressure to Integrate* (the power of customers and competitors to coerce firms to integrate EC network technology) and *Cooperation* (the extent to which a small firms seeks partnership and fairness) be recognized as an important concept influencing EC network integration.

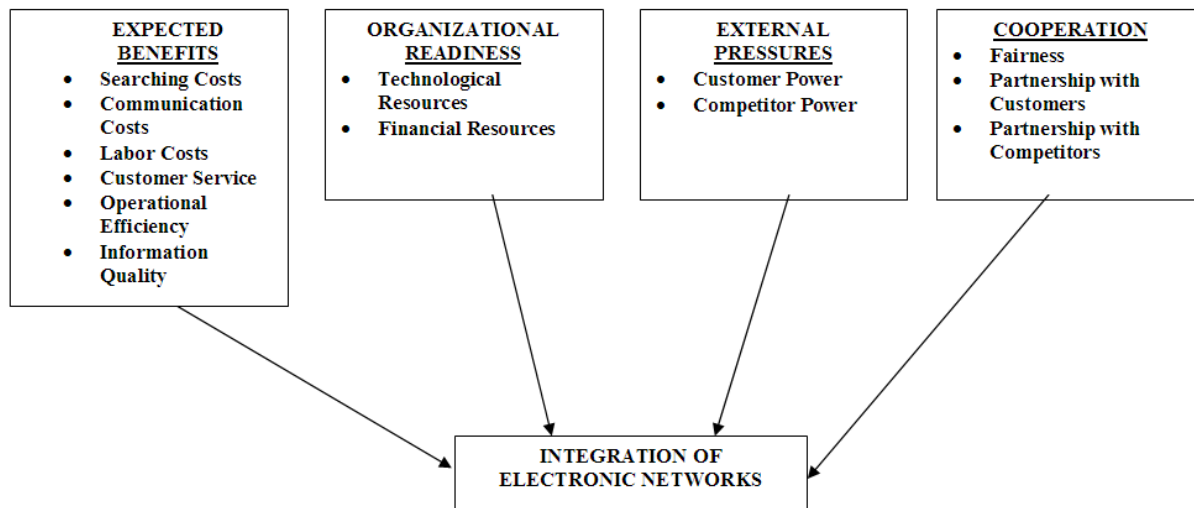


FIGURE 1: NETWORK INTEGRATION MODEL

3.1 Expected Benefits to Small Firms

Expected Benefits to Small Firms are the extent to which firms perceive positive benefits to be enjoyed from participation in an EC Network. Expected benefits will help determine whether firms proceed to integrate an EC Network into their business activities (Todtling and Kaufmann, 2002; Perry, 1999). Cragg and Zinatelli (1995) found three areas of concern for small firms with respect to information systems: 1. inadequate hardware and software, 2. lack of internal technical expertise, and 3. insufficient attention by management to IS. Participation in an EC Network could help identify software and hardware shortcomings, provide a source of technological expertise and counter the perception of management inattention to the potential of EC. Expected Benefits may include: the ability to identify new customers; identifying partners for cooperative sourcing and bidding; decreased communication and labor costs; an increase in operational efficiency; improved customer service and, better information quality (Brynjolfsson et al., 1994).

Proposition One: Small firms perceiving greater expected benefits are more likely to integrate EC networks.

3.2 Organizational Readiness

Organizational Readiness refers to the level of (1) financial and (2) technological (IT) resources available to small firms desiring to integrate into an EC network. Typically, many small firms do not have the necessary financial or technological resources available to investment in electronic networks (Cragg and King, 1993). Another problem is that new technology can fail to achieve anticipated benefits, incur higher than anticipated costs, involve longer-than-projected implementation times, fail to meet technical expectations and create unanticipated incompatibilities between hardware and software systems (Stephens, 1996). However, with the addition of financial and non-financial support, firms can experience success. For example, by providing technological and financial assistance to small firms (government assistance or support of large firms), hurdles to organizational readiness may be overcome (Cragg and Zinatelli, 1995). In another study, data collected from 96 small firms in Singapore showed that computer usage in small firms using consultants was higher than that of small businesses without consultants (Soh et al., 1992).

Managers preferring not to integrate technology often cite the size and the sufficiency of manual systems. For many small firms, installation costs, implementation of any subsequent enhancements, communication charges, usage fees, etc. can become more extensive than originally planned, adversely affecting the financial stability of the firm. Low levels of computer skills, coupled with a limited capability to automate business processes, make transition to a higher level of technological sophistication difficult and costly for firms wanting to join a EC network. Contrarily, successful use of computer systems was related to the experience and computer knowledge of users. It has been found that firms with prior related knowledge of related technologies have a greater ability to recognize the value of new information, assimilate it, and apply it to commercial ends. This experience makes them better able to improve their innovative capabilities (Zahra and George, 2002). Small firms with excess technological and financial resources are less intimidated by technology and are more likely to dedicate slack resources to process integration.

Proposition Two: Small firms with higher organizational readiness are more likely to integrate EC networks.

3.3 External Pressure to Integrate

External Pressure to Integrate refers to the competitive influences existing in the organizational environment. Two main sources of pressure to adopt network technologies come from the competitive pressures imposed by competitors and/or impositions by customers (Howard et al., 2000; Kannan et al., 1998). Imposition by customers is an important factor because weaker partners in inter-organizational relationships are susceptible to impositions by larger trading partners. Coercive tactics exercised by trading partners are a function of the potential power of the imposing partner and its chosen influence strategy. A powerful customer may recommend, make promises or threaten a small firm in order to influence who to buy from, who to sell to, how trades will be conducted and whether they should participate in an EC network. Similarly, firms may scan the environment and see competitors being imposed upon or seek a competitive advantage by being the first adopter of an innovation. As more firms within an industry adopt EC network activities, firms will require network technology as a strategic necessity to stay competitive.

Proposition Three: Small firms experiencing competitive pressure and/or an imposition by trading partners will be more likely to integrate EC networks in sales activities.

3.4 Cooperation

Cooperation refers to the extent to which small firms perceive increased partnerships and fairness resulting from EC networks (Hanna and Walsh, 2002; Schutjens and Stam, 2003; Clemons and Row, 1993; Segars and Grover, 1998). Cooperation implies a degree of deterrence-based trust between buyers and suppliers. Cooperation is a broader term than trust in that an institutional trust is central to the association between firms (Rousseau et al., 1998). This relationship may be based on a sense of geographic or cultural identity, or it may be defined by common interest in an industry's survival and vitality (Lazerson and Lorenzoni, 1999). This sense of cooperation helps explain behavior of network participants that counter short-term market expediency, for a long-term communal benefit; often, cooperative partners will form partnerships with customers to share information or transact business even when a product or service could be purchased elsewhere at a lower price (Frey and Schlosser, 1993). Information may be shared for collaborative advantage when participants share information for mutual advantage (Shields and West, 2003; Ferratt et al., 1996). Additionally, cooperation and competition appear to undermine vertical integration strategy in that the creation of unique assets is reduced to some degree (Poppo, 1995). These findings suggest that EC networks enable both parties to rationalize their operations. However, there is evidence from German and UK auto industries that after the introduction of an EC network they still chose to optimize production at the expense of their suppliers. This may have had a negative impact on cooperation with suppliers preventing long-term true partnerships (Reekers and Smithson, 1996).

Perrow argues that cooperation is generated by structures or contexts that can be deliberately created to encourage trust, even if trust itself cannot be deliberately created (Perrow, 1992). This kind of cooperation has resulted in lower environmental uncertainty with Japanese supplier relations (Bensaou, 1997). Other findings found that EC networks improved cooperation between trading partners and lead to greater satisfaction and performance in extrinsically-mediated business transactions (Vijayasarathy and Robey, 1997). For example, electronic bids can reduce forms of buyer prejudged source selection. Within a cooperative network, bids are made available to a wide number of buyers; as such, electronic bidding should be somewhat fairer than traditional bidding processes. Small firms may also wish to build partnerships with competitors to bid on larger contracts to add new business by complimenting the resources and capabilities of a similar type firm. Thus, firms that build partnerships intent on sharing and discussing information with customers and suppliers on markets, technologies, pay scales, profits, etc. will be more likely to integrate EC networks into their sales activities.

Proposition Four: Small firms able to cooperate with other firms will be more likely to integrate EC networks in sales activities.

4. The Customer-Supplier Life Cycle (C-SLC): A Basis To Determine EC Network Integration

The classic Customer Service Life Cycle (CSLC) of Ives and Learmonth (1984) is a process centric framework that allows managers of supplier firms to take the customer's viewpoint in an effort to provide better service and identify business opportunities (Cenfetelli and Benbasat, 2002;). The CSLC framework can be used to highlight the sequence of activities describing a customer's interactions with a supplier firm. While useful, the CSLC does not completely address the relationships between customers and suppliers because a firm can be either a supplier or a customer within its value chain. By adding a supplier side to the CSLC, one can compare and contrast customer-supplier viewpoints along a continuum of transactional events in order to gain a more complete perspective of the linkages. Interestingly, Ives and Learmonth (1984) originally isolated the customer viewpoint as an antithesis to the supplier perspective presented in the IBM Business System's Planning Model (IBM, 1981).

As shown in Figure 2, the "*Customer-Supplier Life Cycle*" (C-SLC), combines the customer viewpoint of the CSLC with the supplier viewpoint to present a more complete customer-supplier process perspective for both managerial and research purposes (Ketinger and Hackbarth, 1997). One key dimension of the C-SLC is the characterization of the overall buying and selling process. This process perspective is taken because buying and selling represent a sequence of activities that must effectively be managed to maintain a strong customer-supplier relationship. The overall buying-selling process affects three major areas: 1) the nature of products and services bought and sold; 2) the type of value exchanged between buyers and sellers; and 3) the very definition of a buyer or a seller.

A major point of demarcation in the C-SLC is the sales event. The C-SLC model (see Figure 2) separates pre-sales and post-sales sub processes (activities) at the point in time when an order is made. In terms of presales, it is important from a supplier's perspective to effectively identify customers, evaluate requirements and respond to customer requests. If there is a successful match between a customer request and a supplier capability, a response to the customer is formulated, approved by management, and sent back to the potential buyer. If a firm determines that they cannot meet the customer's requirements, they can respond back to the customers with appropriate recommendations and then return to scanning for new sales opportunities. Suppliers review geographic scope, profit margins, service issues, task difficulties, product modifications, etc. before approving and submitting an offer back to a customer. Concurrently, customers are searching for product/service information with the intent of specifying requirements, selecting a supplier and ultimately ordering a product or service.

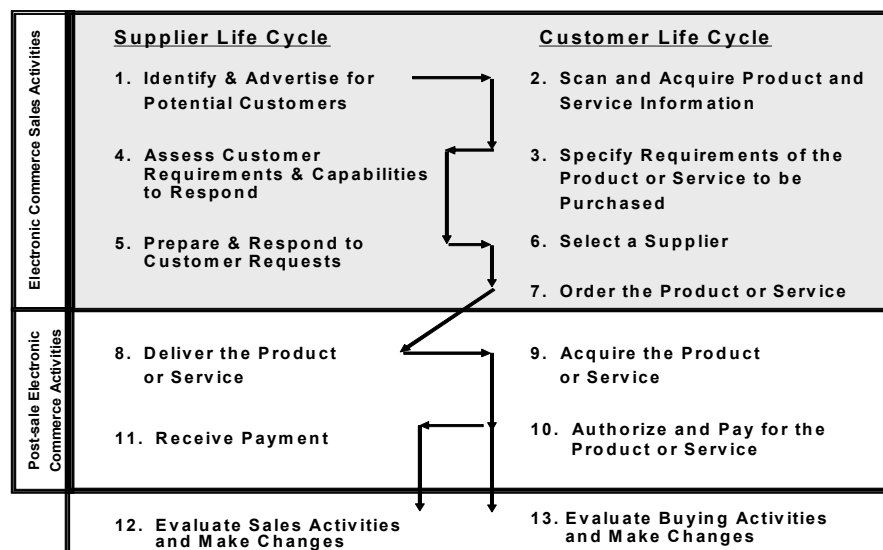


Figure 2: C-SLC Framework

The post-sale portion of the C-SLC includes the manufacturing of products or generation of services, delivery, acceptance and transfer of funds once the customer has acquired the product or service. It is important to note that even though both the supplier and customer can evaluate the business transaction at its completion, it is likely that the evaluation procedure is an on-going process. For instance, if the supplier cannot meet the requirements of a customer, no product or service can be delivered. Thus, a supplier may wish to reconsider the appropriateness of its product and/or service capabilities in order to induce the customer to buy their product or service. Alternatively, if the customer cannot locate a suitable supplier, the customer may wish to reconsider its purchase requirements or continue to scan the marketplace for a more suitable supplier.

Although the integration of an EC network could occur simultaneously across all its customer-supplier (C-SLC) activities (sub-processes), they probably will not. Integration more than likely takes place over time and to a varying degree in different business process activities. Small firms must internally integrate a variety of network applications (e.g. Bid-matching, Browsers, E-mail) into their sales processes before they can actively integrate externally with customers, suppliers, and financial institutions. Thus, the integration of an EC network is itself a process whereby a firm becomes technologically and organizationally capable of transacting business and over time integrates the network into its business processes.

5. Research Method

A qualitative study of seventeen small firms belonging to the Business Gateway (BG) was undertaken to evaluate the integration of EC network into sales activities. The concept behind the BG is simple; it attempts to leverage the Internet to increase business opportunities for small, rural, and minority suppliers by increasing access to market opportunities. Conversely, the BG should facilitate larger government and commercial buyers by increasing the available number of bidders and hence, reducing their cost for products and services. In essence, the BG is an EC framework that allows buyers and suppliers to identify each other and provides tools (i.e., bid matching, e-mail) to interconnect them.

The BG profiles participating small firm suppliers (e.g., product specifications, geographic scope) by key words concerning the goods and services they offer. Buyers use the same key word scheme to describe products and services they intend to procure. The BG provides member suppliers with electronic sources of potential new buyers in addition to traditional modes of communication. These suppliers continuously receive e-mail notifications of potential sales opportunities, which they must assess to determine whether they will bid online. Electronic communication supplants traditional communication mediums by extending both the depth and breadth of information between buyer and seller. Based upon appropriate evaluation, suppliers may request changes to their BG profile, when their profile is not in agreement with matching prospective buyer requirements.

Table 1 presents an overview of the studies research steps. Based on recommendations of past qualitative researchers a conceptual model and propositions were formulated to help guide the exploratory investigation (Denzin 1978; Eisenhardt, 1989). Data collection methods included a semi-structured case protocol, archival records, and telephone follow up interviews. This approach improved richness and depth of findings and enhanced the construct validity of the study (Denzin 1978). Interviews provided the major source for primary data. The protocol questions were written to encourage discussion about the research concepts in the context of the BG. The interview included seventeen open-ended questions directly related to the independent and dependent variables. It was designed to discuss the integration of EC sales activities, (the integration dependent variable) (Figure 2) as well as the four concepts (independent variables) influencing integration as outlined in the Network Integration Model (Figure 1). To help further eliminate subjectivity, interview data was then presented to judges who evaluated each activity and concept as either high or low. Results of this interjudgment were analyzed following the guidelines and procedures for measuring reliability of qualitative data outlined in the marketing research (Rust and Cooil, 1994). Finally, the authors interpreted results to best understand the relationships found. In essence, the interview data assesses the extent to which the relationships among the concepts are consistent with the studies expectations and propositions.

At the time of this study, there were one hundred and three firms belonging to the BG. All of the firms received modest technical assistance, discounted access to the Internet and a subscription to the BG computer bid matching services. By joining the BG, these firms had already made the decision to adopt EC and had begun the process of integrating EC activities into their sales processes. To ensure that firms had a reasonable amount of time to integrate EC into their sales processes, all firms included in the sample were members of the BG for at least one year. Firms were limited in size to less than \$52 million in total sales and numbered from 4 to less than one hundred fifty employees to reflect smallness. The researchers sought to establish representative industry comparisons (printing; construction; advertising; manufacturing; systems integration; and service) to gain the greatest understanding of

small firm EC integration. Seventeen BG firms were (semi-randomly) selected across these industries based on meeting the previously mentioned criteria. The interview protocol was pre-tested on three BG firms and modifications made to the final interview protocol (See Appendix A). Face-to-face interviews were conducted with the most knowledgeable employees concerning the integration of EC (most often the owner/CEO of the firm). To ensure consistency and reliability, the interview protocol was used for all interviews. All interviews were tape recorded and the researchers transcribed the interview results into a narrative for each of the open-ended questions for each firm.

Table 1. Overview of the Research Steps

Scope of the Research	Small business seeking non-market bilateral governance relationships with customer firms using EC networks to integrate buyers and suppliers.
Identify Domain	<p>Small business firms (suppliers) utilizing the Business Gateway (BG) as a communication medium (EC network) with customer firms</p> <ul style="list-style-type: none"> • Subject Firms must have participated in BG at least one year • Less than \$52 million in total sales • Less than 150 employees to reflect smallness • Select representative industries (printing, construction, advertising, manufacturing, systems integration and service industries)
Collect Data	<p>Develop protocol Test protocol on 3 BG firms Modifications made to protocol Conduct in-depth interviews with 17 firms</p> <ul style="list-style-type: none"> • Tape record all interviews for consistency and accuracy of results • Face-to-face interviews with owner of company or knowledgeable employee • Use of telephone to complete interviews and request additional clarifying information
Compile Results	<p>Transcribe interviews Select 5 judges familiar with EC networking issues Interviews formatted for the 5 judges to evaluate questions</p> <ul style="list-style-type: none"> • Question results transcribed into open-ended questions for each judge to evaluate • Written and verbal directions formulated and given out • Questions randomized for each judge • Judges asked to assign a high or low value to each question • Results from each judge summarized • Judge inter-rater agreement tabulated using proportional reduction in loss method • Compile results and build result tables
Interpret and Present Results	Present results in tables and appendices

Criteria were next established to allow five independent judges the ability to read the narrative and assign a high or low value to each of the interview questions (See Appendix B). Invited judges with strong IS professionals backgrounds were given verbal instructions, a notebook consisting of an overall instruction sheet, and randomized narrative responses for each of the seventeen firms. Judges were asked to read each question, the transcribed narrative, and then assign a high or low value to each question for each firm. Judges were also given the option of "Cannot Make a Determination." Results were analyzed following the guidelines and procedures for measuring reliability of qualitative data. These procedures, as outlined in the marketing research (Rust and Cooil, 1994), assume a decision theoretic loss function that formally models the loss to the researcher of using wrong judgments, and produces a reliability measure called the "proportional reduction in loss" (PRL). Within procedures outlined in Rust and Cooil (1994) researchers can resolve a "Cannot Make a Determination" decision by assigning a high or low value to a result without biasing the results. As explained in Rust and Cooil (1994), the PRL measure can be viewed as a direct extension and generalization of Cronbach's alpha to qualitative cases. Adopting Nunnally's (Nunnally and Bernstein, 1994) reliability rule of thumb of .70 for exploratory research, we found a very high proportion of inter-judge agreement between the 5 judges, with PRL levels exceeding .70 for 12 of the 17 measures. Four of the five measures below .70 were within 6 percentage points of the recommended reliability indicator. With

only Financial Resources showing a significant departure from this standard. As previously mentioned, all firms participating in the BG received some financial assistance, which may partially explain the lower reliability of this variable. In addition to reliability, validity checks were made by cross-checking the empirical results with the in-depth interviews. The scores for each judge were tabulated for each of the 17 interview questions by assigning a zero to a low score and a 1 to a high score. These scores were used to establish a rank order of firms based on the extent of integration and for descriptive statistical analyses. The researcher then used this data as well as the actual interview transcriptions to further interpret overall results as outlined in the next section.

6. Results And Discussion

The Network Integration Model (Figure 1) theorizes 4 antecedents that predict the systemic integration of the BG network across supplier sub-processes using the C-SLC (Figure 2). To provide clarity to our results and resulting discussion we developed a common structure to present the study results across both models for comparison and to ease understanding. To accomplish this, the C-SLC activities (D1, D2, D3, D4), as shown in Table 2, on the supplier side of the C-SLC, were marked with asterisks describing high scores on each activity for all firms (with the highest score being 5, whereby all 5 judges rate a firm high on an activity). To determine the extent of BG Integration, we summed the judges scores across each of the four C-SLC activities of our dependent variables (D1+D2+D3+D4 in Appendix A) to produce a Summary Score of BG Integration and then rank ordered the firms based on their overall extent of BG integration in sales activities. Using this scoring system, the maximum summary score is a 20 (where all 5 judges scored a firm high on all 4 integration activities) alternatively, a firm with a score of zero would be low on all measures of the dependent variable. Table 2 rank orders the 17 sample firms in terms of their Summary Scores of BG Integration ranging from a zero (Construction Firm A) to 18 (Service Firm C and Printing Firm B). The Summary Score of BG Integration across activities allowed us to rank firms from low to high. To further distinguish levels of BG Integration, firms were divided into three groups; 7 high integrators, 7 low integrators, and 3 middle integrators.

Table 2. Integration of the BG EC Network in C-SLC Sales Activities

Firm ID	Process Flow of Pre-sales Supplier Processes				Overall Integration
	D1 Identify Customers	D2 Assess Customer Requirements	D3 Prepare & Respond to Customers	D4 Evaluate Activities & Changes	Summary Score of EC Integration in Sales Activities
Construction Firm A	-	-	-	-	0
Systems Integration Firm A	*	***	-	-	4
Construction Firm B	-	****	-	-	4
Printing Firm A	****	-	-	-	4
Manufacturing Firm A	*****	-	*	-	6
Manufacturing Firm B	****	*	-	**	7
Advertising Firm A	*****	*	*	**	9
Manufacturing Firm C	*****	***	-	**	10
Systems Integration Firm B	****	*	*****	-	10
Service Firm A	*****	*	-	****	10
Systems Integration Firm C	*****	*	*	*****	12
Advertising Firm B	*****	**	****	*	12
Construction Firm C	*****	****	***	*	13
Systems Integration Firm D	*****	***	*	*****	14
Service Firm B	*****	*****	***	***	16
Service Firm C	*****	*****	****	****	18
Printing Firm B	*****	****	****	*****	18
Percent Interjudge Agreement	90.59%	67.06%	76.47%	76.47%	77.65%
Note:					
1. Stars indicate the number of judges selecting HIGH as a variable score. (- = 0, * = 1, ** = 2, *** = 3, **** = 4, ***** = 5)					
2. Low integrators designated in light gray; Medium integrators designated in gray; and High integrators in darker gray.					

7. Factors Influencing EC Integration

To examine the influence that the four antecedent concepts proposed in our conceptual model (Figure 1) have on BG integration (as shown in Figure 2), we compared each concept with the summary BG integration score (Table 2) for each participating firm. Tables 3 and 4 rank firms based on judges' determinations of the extent to which firms were low or high on each antecedent (expected benefits, organizational readiness, external pressure, and cooperation variables) of our conceptual model (Figure 1). In addition, it positions firms within the three integration groups (low, medium and high). The results indicate that these concepts have different relationships with BG integration of sales activities.

7.1 Small Firm Expected Benefits (Proposition 1)

As shown in Table 3, Information Quality was an important expected benefit for firms joining the BG. Numerous firms stated in interviews that they expected the BG to "cut through red tape and reduce the headaches" associated with procurement. For example, Printing Firm B expected to "access information faster and reduce paperwork to "free up the people" to do other things." Firms in our study were most concerned with the quality of sales information they would receive compared to more traditional sources of buyer information prior to joining the BG. Firms anticipated more bids and more complete information about prospective contracts through the BG. Service Firm B thought that the "The major benefits to the BG were the opportunities to bid on government contracts, make more jobs, and spend less time searching for new jobs. We wanted more customers that we didn't know about." Typically, traditional paper publications failed to provide timely sales opportunities. Previously firms also had to track down phone numbers, points of contact and product specifications, all of which are specified fields within the e-mail bidding replies of the BG. Printing firms held moderate expectations that searching and communication costs would be reduced as well as cuts in labor costs. Advertising Firm A thought they would learn more about submitting bids. BG firms also expected improvements in Operational Efficiency. For example, Service Firm A thought the information access and reductions in paperwork "...would free up some of the girls in the back room to do other things." Many firms saw Customer Service as a post-sales activity (i.e. not effecting customers they already had).

Table 3. Expected Benefits Ranked by Level of Integration

Firm Identity	Expected Benefits					
	Searching Costs	Communication Costs	Labor Costs	Customer Service	Operational Efficiency	Information Quality
Construction Firm A	-	-	-	-	-	****
Systems Integration Firm A	*	-	-	-	*	-
Construction Firm B	-	*	-	-	*	*
Printing Firm A	-	-	-	-	*	****
Manufacturing Firm A	**	*	*	-	*****	***
Manufacturing Firm B	-	*	*	****	*****	****
Advertising Firm A	-	-	*	-	***	-
Manufacturing Firm C	-	*	-	*	-	****
Systems Integration Firm B	**	-	-	-	-	**
Service Firm A	****	-	-	****	-	*****
Systems Integration Firm C	-	*	-	-	-	-
Advertising Firm B	****	-	-	*	****	****
Construction Firm C	****	*****	*****	****	*	*****
Systems Integration Firm D	-	****	*****	-	***	**
Service Firm B	*****	-	*****	*	**	*****
Service Firm C	**	-	-	-	**	****
Printing Firm B	****	*****	-	****	****	*****
Percent Interjudge Agreement	77.65%	85.88%	92.94%	76.47%	71.76%	72.94%

Note:

- Stars indicate the number of judges selecting HIGH as a variable score. (- = 0, * = 1, ** = 2, *** = 3, **** = 4, ***** = 5)
- Low integrators designated in light gray; Medium integrators designated in gray; and High integrators in darker gray.

7.2 Organizational Readiness (Proposition 2)

As shown in Table 4, both high and low EC integrators deemed that they had the Organizational Readiness to make use of the BG. However, neither Technological Readiness nor Financial Readiness was highly associated with BG integration. Interviews indicated that most firms felt that they had the necessary technological resources to participate in the BG. For instance, even one of the most technically capable companies (Printing Firm B) readily upgraded their buildings electrical system and bought additional hardware to accommodate BG membership. Such experiences suggest firms could generally afford the BG network services and that they were aware of their technological deficiencies and moved quickly to solve these problems. However, several firms (Construction Firm

A, Advertising Firm A, Construction Firm C), the BG were technology less developed and the BG was their first real exposure to IT. Interestingly, low integrators were less motivated to upgrade their technological capabilities; typically wanting to know the exact pay-off of any additional technological investment, while high integrators were generally more enthusiastic about experimenting with additional technologies such as the using the WWW and EDI. Construction Firm A, a low integrator of technology, used BG resources to capture bid information over the network, seeking to delay upgrades to their technology until they were confident in the BG's ability to deliver increased business opportunities.

All firms seemed to find the necessary funds to participate in the BG. Firms were provided a modest discount on Internet access and free bid matching software but according to most interviewees this had little impact on their decision to join the BG. Both high and low integrators indicated they would have purchased similar services from another Internet Service Provider (ISP) if the BG did not provide the subsidized service. Given these results, it seems likely that the availability of low cost hardware and software makes participation in networks like the BG affordable and technologically feasible for even the smallest firms. Printing Firm A is an example of a firm with limited resources at the time they joined the BG. "We had all the hardware we needed to join the BG. We didn't need any outside consultants. The hardware we have currently in use makes effective use of the BG. We have one phone line connected to a modem and several PC's." In essence, any firm with a personal computer, modem, and software to inter-operate with a network can participate in an EC network. These results suggest that financial and technological resources are really more likely adoption issues than factors influencing integration.

Table 4. Organizational Readiness, External Pressure and Cooperation Ranked by Level of Integration

Firm Identity	Organizational Readiness		External Pressures		Cooperation		
	Technological Resources	Financial Resources	Customer Power	Competitor Power	Fairness	Partnership with Customers	Partnership with Competitors
Construction Firm A	-	**	-	-	*	**	**
Systems Integration Firm A	****	****	-	**	-	-	-
Construction Firm B	-	-	-	-	*****	***	****
Printing Firm A	*****	**	-	**	**	-	***
Manufacturing Firm A	*****	***	*	-	**	**	-
Manufacturing Firm B	*	**	***	*	**	****	***
Advertising Firm A	***	***	-	-	*	-	-
Manufacturing Firm C	****	****	-	*	-	-	-
Systems Integration Firm B	*****	****	-	-	*	*	-
Service Firm A	****	***	-	-	-	****	**
Systems Integration Firm C	*****	***	-	-	***	**	*
Advertising Firm B	***	****	-	-	*	*	-
Construction Firm C	*	****	-	-	*****	*	***
Systems Integration Firm D	*****	***	-	-	*	*	-
Service Firm B	****	***	-	-	*	*	****
Service Firm C	*	****	-	-	***	***	**
Printing B	***	****	-	*	*	****	**
Percent Interjudge Agreement	72.94%	51.76%	94.12%	85.88%	65.88%	63.53%	68.24%
Note:							
1. Stars indicate the number of judges selecting HIGH as a variable score. (- = 0, * = 1, ** = 2, *** = 3, **** = 4, ***** = 5)							
2. Low integrators designated in light gray; Medium integrators designated in gray; and High integrators in darker gray.							

7.3 External Pressures (Proposition 3)

We suggested that firms perceiving challenges from larger firms would seek to even the playing field by implementing an EC network strategy in response to industry trends and the long-term outlook of their firm. However, we found that BG firms ranked imposition of influence by trading partners the lowest of their expectations for the BG. As indicated by Table 4, Customer Pressure and Competitor Pressure were not highly associated with the integration of the BG in small firms. Neither high nor low integrators felt coercive pressure from either customers or competitors to participate in the BG. Generally, the BG was viewed as a strategic move that was going to place the firm in an improved revenue generating position rather than to appease or neutralize a coercive

customer or supplier requirement. Most often, sample firms considered themselves first-movers in attempting to integrate the BG network into their business activities. From a first mover perspective, sample firms felt compelled "to move quickly to gain experience, establish a presence and be in a position to benefit when the government and commercial procurement really transition to electronic commerce."

7.4 Cooperation (Proposition 4)

Numerous firms held expectations that participation in the BG network would improve cooperation in their bidding for contracts and establishing partnerships. Several firms emphasized that they wanted to increase business partnerships with customers and competitors; stating they were excited about "finding new opportunities to bid on large contracts." For example, Printing Firm B anticipated opportunities to coordinate with other small firms to bid on contracts "too big for them to handle alone". Interestingly, firms like Service Firm B, Printing Firm B, and Manufacturing Firm B mentioned that they shared resources with other firms. Manufacturing Firm A Stated, "We share resources and information with other small firms to a limited degree. We share resources like spare parts and equipment and some materials. We have talked informally about the possibility of forming business partnerships with firms similar to our own in order to compete on larger contracts but haven't done it. We would especially be interested if they had a capability I don't have." Another example comes from a minority owned drug-testing firm (Service Firm C). Experienced gained in electronic proposal development and bidding for a large U.S. Postal contract established confidence in Service Firm C's ability to handle a large drug-testing contract. A second computer bid match resulted in Service Firm C being designated one of seven firms qualified to drug test commercial carrier firms of U.S. Mail (i.e. UPS, Delta, Unite Airline, and large trucking firms). In an effort to leverage these unexpected windfall opportunities, Service Firm C sought partnerships with other drug testing firms to meet contract specifications. Former small firm competitors were now cooperating to increase the scope and reliability of their joint operations. Thus we see an example of partnerships developing over time as quality, service and price issues begin to define relationships in the marketplace.

Other lessons can be learned by this example. Operational efficiency was improved because contract information did not have to be reassembled and distributed to other firms. Searching costs were reduced because Service Firm C services were sought-out by customers and disseminated to competitors who may not have known about the opportunity. Service Firm C saw communication and labor costs reduced because they did not have to expend effort to convince clients of their capabilities. In sum, high integrators attempted to integrate all BG sales process activities, suggesting they were more tolerant of the higher initial start-up costs associated with modifying the new process. In addition, they seemed to have a greater understanding of the long-term nature of integration benefits.

For those firms unlikely to form partnerships through the BG, it was a case of not wanting to cooperate with other firms. Systems Integration Firm A stated, "We would not generally consider the pooling of resources and information with other small firms to successfully bid on contracts." Printing Firm B said, "We haven't formed business relationships in complementary industries yet. Minority firms don't compete well with each other or the big firms." Service Firm B stated, "We probably wouldn't form business relationships with firms in complementary industries to gain competitive advantages." Clearly there were obstacles to overcome in the mindsets of some firms in creating a sense of cooperation within the BG network even though the possibility might exist to leverage some contracts to the mutual benefit of participating firms through the sharing of specialized resources and expertise.

8. EC Network Integration

As shown graphically in Table 2, the integration of BG into the sales activities appears to take place in a sequence (D1, D2, D3, and D4) with the total number of declining asterisks for all firms from left to right in a decreasing slope. Some firms only integrated through D1, others through D2 and D3. D4 represents a process of evaluation whereby a firms evaluate activities and make changes. Integration seems to take place over time and to a varying degree in different business activities. While not universal, score differences across C-SLC pre-sales activities further suggest the integration of sales activities. Sample firms integrated sales activities in a gradual fashion because it is fundamental to do so. For example, firms can not properly respond to a customer bid without first assessing customer requirements. One cannot assess a customer's requirements unless you have identified a customer. As firms undertook BG integration, they seemed to gradually make higher levels of commitment to the alteration of their human, technical and procedural process components. Construction Firm C assigned a specific person as did Systems Integration Firm D to oversee and access BG RFP bid information.

Given bounded organizational learning capacities and constrained resources, firms seem to pace their integration based on a logical activity sequence closely aligned with the C-SLC. As an example, Service Firm B wanted to completely automate pre-sales contracting in order to lower costs and improve efficacy. Interestingly,

Service Firm A wanted to initiate the same strategy but needed to wait until a new office complex was completed so that the necessary technical infrastructure could be in place before they attempted any more changes to their business processes.

Further anecdotal evidence from interviews suggests that firms differ in their extent of BG Integration. For example, Construction Firm A did little to integrate the BG into their business processes while Printing Firm B and Service Firm C were aggressively seeking ways to leverage computer bid matching information to secure additional contracting opportunities. High integrators tended to have tighter control of their financial management situation and cited specific demand for expected communication and labor costs reductions. While not as decisive as the other coordination cost indicators, high integrators were more likely to use BG bid information to improve customer service. Low integrators were less clear of BG payoffs, had no EC network strategy, and were most concerned with the technological infrastructure and applications. Results seem to indicate some industry differences in the extent of BG integration of Sales Activities. Service firms integrated the BG to a greater extent than did manufacturing firms. Based on interviews it appeared that the service firms were more customer-orientated than manufacturing firms and focused more on integrating the BG to better serve customers and lower their costs. Importantly, it seems service firms wanted to stand out from the competition since there was no previous perception of customers demanding network access.

We also found several differences between firms within industries. Firms from the printing, advertising and construction industries had both high and low integrators. High integrators appeared to have greater expectations about the benefits of BG sales integration and seemed more realistic in their appraisal of when they would realize BG sales integration benefits compared to low integrators. Printing Firm B used the BG to update pricing information, look for future positions in niche markets and look for printing activities they were not currently engaged in. Low integrators, while experiencing some success identifying customers, appeared to be less involved in assessing customer requirements or preparing bid responses back to customers. For instance, they seemed less likely to evaluate integration activities nor make changes to existing business processes given their lack of success in assessing customer requirements. Printing Firm A complained about the unfair advantage larger firms had in buying paper and their ability to accept contacts at or below cost to keep their presses in operation during non-peak times. They expected the BG network to directly lower costs or provide opportunities to bid government contracts specifically set aside for minority firms rather than use the information to out-position or out-service their competition.

Keeping this perspective in mind, high integrators tended to work the system; searching, requesting and asking for information to leverage each potential contact. Low integrators tended to expect automation to provide complete information regarding a bid and when it was not provided within the e-mail bid, searched for other bids more clearly matching their expectations. Advertising Firm A found that BG information had little practical value with too many inappropriate bid matches. Specifically, if the RFP/RFQ contract specification did not meet their preconception of what they should be receiving, they passed on the bid opportunity. Thus, low integrators appeared less interested in determining customer requirements, giving them fewer opportunities to prepare and respond to customer requests; as a result, they rarely, if ever prepared a bid. We found that high integrators of EC technology did tend to Identify & Advertise for Potential Customers as well as Assess Customer Requirements and Prepare and Respond to Customer Requests. For example, Advertising Firm B bid 30-40% of the 12-15 bids they received daily, reviewed winning bids and made phone calls to clarify procurement details. This aggressive approach resulted contracts such as one made with a large government agency for 50,000 drink coolers with the agency logo on them. Low integrators seem to do a poorer job of Assessing Customer Requirements, and Preparing & Responding to Customer Requests.

Interestingly, even though low integrators were often unhappy with the number or quality of the computer bid matches they received, they rarely changed their computer bid matching profile. For example, interview results suggest that high integrators were able to locate new customers more efficiently through key word matching and analysis of information provided by the BG on past contract awards, while low integrators rarely mentioned these events. This would suggest that low integrators sought more immediate benefits, while high integrators were more likely to review bid matching results to identify customers. High integrators tended to use BG information to update their bid matching key words to better align themselves with customer requirements as well as learn more about the contracting processes of firms accessing the BG network. Because high integrators tended to evaluate their redesigned sales activities, they made periodic revisions to their computer bid matching profile. This helped them better align their ability to respond to RFPs and RFQs.

Information overload was a real common problem observed in many firms after the implementation of the computer bidding system. For example, Manufacturing Firm B experienced problems with their bid matching

profile and received too many matches for products they did not manufacture. Fine-tuning of the product-bid matching profile was time consuming. The CIO of Manufacturing Firm B reported that "time was money" in his small company and he was reluctant to "...dedicate a significant amount of his time to playing with the system everyday...I had hoped that the information would be better... for example, I just got a batch of e-mails from the BG and I can immediately tell they are not a match for us." In fact he seldom reviewed the reams of e-mails that he received on a daily basis; he just looked at the subject lines and made an instant determination. Learning to deal with increased information flows and integrating them with human resources into a cohesive sales process appears to be a particularly problematic inhibitor of network integration.

Firms within the BG belonged to many different types of industries (printing, construction, systems integration, advertising, service and manufacturing). Interviews showed that the firms were unsure how to explore the possibilities of partnership with firm from different industries. Printing Firm B reported, "I am sure the advertising firms could help us, but I am not sure how to get started working with them, so I don't." This points to the possibility that homogeneous "vertical" industry networks may show a stronger association between partnership and network integration than do heterogeneous networks, such as the BG. It may be that BG firms did not develop the robust, flexible, and durable organizational routines for learning that are necessary to sustain collaborative relationships intended to share knowledge, skills, and resources across organizations in a timely fashion (Powell, 1998).

Interestingly, firm expectations that the BG would increase the coercive pressure imposed by customers and competitors on their operations was not realized. In fact, firms found coercive pressure to be very low and thus not strongly associated with network integration. Construction Firm B expected more interactions with both suppliers and customers but found, "None of our suppliers are using computer networks in transactions with our company. We expected more relationships with our customers. In fact, things haven't changed." It would seem that external pressures might be more of an influence for firms who are late adopters rather than early adopters of network technology. Another explanation is that BG was not used to interact with a majority of business customers thus, a good deal of business was done outside of the BG net, and the pressures from inside the network did not affect the firms very much.

One explanation for this result maybe that while fairness and cooperation remain worthy goals, the reality of day-to-day small business survival pushes for individualist sales strategies and tight fiscal management practices. There is some evidence from auto manufacturers, that they optimize their production at the expense of their suppliers leading to a negative impact on cooperation with suppliers preventing long-term true partnerships (Reekers and Smithson, 1996). However, some high and low integrators indicated that they perceived more fairness in the sales activities after using the BG automated bid processing. It is noteworthy to point out that our perceived measures of fairness and cooperation were framed in context of initial implementation of an EC network. This may suggest that a firms perception of fairness increases as the firm gains experience.

The reader is reminded that this study takes place at the end of the first year of participation in the BG. If over time, early adopters of EC networks were successful in building cooperative relationships with trading partners, then later adopters would feel more pressure to adopt this technology. Therefore, large buyers using EC networks, would have more coercive power within EC markets and early adopter supplier firms would have established expertise in leveraging this innovation. As with fairness, partnerships may take more time to develop and blossom.

9. Conclusions

This study was a first attempt to characterize integration as a process within the pre-sales activities of firms. Future researchers may find it useful to characterize integration as a process. This study also demonstrated in the case of the BG, realized benefits (searching, communication, and labor costs) were the most influential concept associated with BG sales integration. This result was consistent with King and Teo (1994) who found that internal factors and perceived needs played a stronger role than external factors in deploying information systems. Managers at firms with lower integration had a lower understanding about potential benefits. High integrators seemed to focus on business efficiencies and appeared to be more strategic in focus by identifying indirect benefits such as presence, new business relationships and the ability to scan new and remote markets. Low integrators appeared to be more concerned about immediate marketing pay-off and lowering costs. They anticipated buyers coming to them with an exact match to their initial computer bid matching profile without understanding the need to work the system and capitalize on any advantages. While most firms felt that improvements in information quality and operational efficiencies would be important realized benefits, these two indicators did not distinguish high integration as originally proposed.

Organizational readiness was an important concept only in that it showed that Technological and Financial Resources were readily and cheaply available for firms adopting EC technology. We found high organizational readiness does not necessarily lead to high integration. Printing Firm A had the technological and financial resources to do more with the BG. Unfortunately, the owner of the Printing Firm A was not convinced the BG was going to work. "If you can show me it works, I'll adopt other features of the BG. Yes, Web based EDI is what I want to do but I want to know more about it before I sign up. Before I automate the bidding process by using web EDI: Does it work? Show me it works?" This may suggest that organizational readiness is a necessary requirement for the initiation of EC but not a fundamental part of integration. Another possibility is that because small firms may have inherently less in the way of managerial expertise to draw on than do large firms, they are less likely to be sure of an effective response in uncertain conditions. An additional concept, characterized as "Cooperation," did not greatly impact the sales integration of EC technology.

An additional observation taken from firm interviews suggests that firms with previous experience in preparing and responding to formal paper-based bids tended to be more successful in making use of electronic computer bid matching than those firms that had little experience in formal competitive bidding processes. This was particularly true of Construction Firm C whose major sources of revenue were derived from State road building initiatives, Service Firm B who had military administrative support contracts and Printing Firm B who used dedicated printing presses to meet U.S. Commerce Department emergent printing requests. These firms tended toward higher integration and mentioned several times during their interviews how they were able to assist other small firms in deciphering the government contracting maze of paperwork. For example, Printing Firm B said, "Small businesses don't know how to work though the contracting and bidding. Nobody can tell you the ins and outs until you've been there. For instance, there is a number to call in Washington to find out why your payment for services has not been received but they can't help you. You have to wait sixty days. What you can do is resubmit the paperwork and mark it duplicates. No one tells you any of this. It takes an Einstein to go through the manuals to figure this stuff out."

10. Limitations And Research Opportunities

Like all research, there are limitations in this study that must be mentioned. For example, our sample of seventeen is drawn from only one heterogeneous EC network in the United States. Also, it may be true that managers in firms with higher levels of integration when asked to recall in hindsight their expectations about integration benefits reported higher levels of expectations based upon their experiential knowledge about the potential benefits. While firm selection was based on a cross section of similar firms to ensure a participation across industries, the selection was certainly not truly random and did not encompass firms from outside the U.S. We did not choose firms based on the nuance of their unique sales processes or techniques. This might a potentially interest future area of investigation. We also did not consider firms by marketplace power or strategic position and were restricted to firms participating in the BG network. Our results suggest that industry and between industry differences may exist, yet our sample was too small to make any specific recommendations. In this context, future research might examine larger sample sizes, randomly selected firms, sales processes in specific industries and firms and networks located outside of the continental U.S..

Our observations may not be generalizable to large firms. Larger firms may be more likely to coerce other firms or see the long-run benefits of EC networks to a greater extent than small firms. Therefore, they may develop strategies to encourage trading partners to adopt EC networks and use technologies not readily available to small firms. Large firms tend to be more vertically and horizontally integrated within their value chains than smaller firms. This may affect the extent to which large firm are willing to cooperate with other firms.

It is important to note that we only evaluated the supplier sales side of the C-SLC. Future research might look at both sides of the C-SLC and the integration of network technologies. The buyer-supplier relationship can also be researched not only from a within the firm perspective but across the value chain by looking at comparisons of integration factors between firms. By looking at firms as both a supplier and buyer we will see the true extent of network integration. We only studied a single EC network in a single context (bid matching), however, the C-SLC allows firms to look at different technologies and their impact on each process activity of the C-SLC.

Finally, we did not measure the impact on success as stated in our EC Network Integration Model. While we did find that high integrators benefited from BG information, the effect of integration on the bottom-line was not evaluated. Our firms were only in their first year of EC participation and uniform financial results were lacking. Thus, under ideal conditions, we should study a cross section of large, medium, and small firms across divergent industries participating in EC networks, look at the complete C-SLC, and evaluate multiple network technologies utilizing both traditional and non-quantifiable measure of success. Furthermore, one year may not have been

enough time to fully evaluate the establishment of partnerships and the degree of cooperation between BG firms. Additionally, the notion of fairness in the context of small firms bidding on government contracts against more established and knowledgeable firms would be of interest to researchers investigating the transparency of government acquisition processes. Future researchers may want to include a trust construct in the Network Integration Model to measure the extent to which firms trust government agencies with the sharing of financial and performance information in ways that inhibit or extend the spread of small firm networks. Also, the existence of constructs reflecting the existence of unique dynamic capabilities of successful firms may also be an avenue of exploration in predicting the successful integration of small firms in an EC network.

11. Implications For Practice

Participation in an EC network does seem to create business opportunities. Buyers participating in an EC network benefit by having more suppliers to choose from thereby decreasing for the costs of goods and services. Suppliers also benefit, both from an increase in the quality of information and experience gained in using a new innovation. While many study participants stated that the number of actual contracts awarded through the BG network were less than expected for the first year, firms seem to have benefited from a heightened exposure to EC networks and improved sales practices. The more successful of the small firms we interviewed modified their existing sales processes to seamlessly scan and locate additional business opportunities through the BG EC network. With constant honing they were able to better assess customer requirements to prepare bid responses. If their modified sales process were not satisfactory, they continued to alter their profiles and bid assessment techniques until they were successful in opening a new sales channel.

Some firms were convinced from the beginning that the BG would be beneficial. Service Firm C stated that "The primary benefit to joining the BG were the political connections and access to state and local contracts. We hoped to gain 50% of our new customers from the BG." Unfortunately, Service Firm C stated they didn't use the BG as extensively as they needed to from the beginning. However, this firm remained true to its expectations. After a year, "The most important benefit to being connected to the BG are the political connections. Our firm's ability to transact electronically makes us more competitive than other firms in our industry. It gives us a strategic advantage." Clearly, Service Firm C was convinced from the beginning that the BG was going to work for them and worked the system to align expectations with the desired results. Not every firm in the BG had that attitude. In order to develop the positive attitudes necessary to improve understanding of potential benefits and consequently improve the level of network integration in BG firm business processes, the BG must develop expanded levels of trust, moving beyond just cooperation. We envision an expanded network of firms centered on industry groupings, rather than diverse firms seeking unfamiliar relationships and synergies. Networks of similar type firms may lead to greater information sharing as thriving firms within the BG realize benefits and serve as role models for less forward-thinking, cautious firms.

Overall, we found that EC networks are not a "silver bullet" for small firms. Success within an EC network requires planning and hard work. Business opportunities are sometimes indirect and must be drawn out through numerous electronic information sources such as careful RFQs/RFPs and winning bid results. Firms must not expect to sign-up for services, write a product profile, and then sit back and watch sales roll in. Computer bid matching profiles require management, customers need to be called, and firms need to learn how to correctly write and submit electronic bids. Inter-firm cooperation is possible and may lead to successful bidding but it is often difficult to initiate. Experience and the ability to critically evaluate C-SLC activities influence firm success. And most importantly, integration of an EC network is a long-term commitment to business process change and typically takes time to show significant bottom-line impact.

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APPENDIX A: INTERVIEW PROTOCOL OUTLINE FOR SAMPLE FIRMS

Note: Questions were written to encourage discussion about the research variables being studied. Questions I-1 through I-13 were framed as expectations at the time the firm's began integrating EC into their business processes. Questions D 1 through D4 were framed in terms of their assessed use of the EC in business processes after one year's time. Questions below are followed by the name of the research variable examined (italics), followed by example probes.

D-1 To what extent does your firm use the BG to identify new customers? (*ID Customers*) (*New customers found, Increased opportunities, Increased competitiveness*)

D-2 To what extent, does your firm evaluate customer requirements by reviewing bid matching and winning bid information? (*Evaluate Customer Requirements*) (*Bid matching review process, Bid matching evaluation criteria*)

D-3 To what extent, has your firm prepared Request for Quotes (RFQs) and Request for Proposals (RFPs) from information received from BG computer bid matching? (*Prepare & Respond to Customer Requests*) (*RFQ/RFP preparation process, Availability/accuracy of RFQ/RFP information*)

D-4 To what extent, did your firm modify its initial computer bid matching profile? (*Evaluate Process*)
(Description of bid matching profile, Factors influencing changes to the bid matching profile)

I-1 To what extent did you expect the BG to assist you in identifying new customers? (*Searching Costs*)
(Finding new customers)

I-2 To what extent did you expect the BG to decrease your overall communication costs? (*Communication Costs*) (Reduced communication costs, Telephone bills, travel costs)

I-3 To what extent did you expect the BG to decrease your total labor costs? (*Labor Costs*) (Reduced labor costs, Cut number of employees, Reassignment of personnel)

I-4 To what extent did you expect the BG to help your firm better serve your customers? (*Customer Service*)
(Improved customer service, Increased satisfaction)

I-5 To what extent did you expect the BG to assist your firm in improving its operational efficiency? (*Operational Efficiency*) (More efficient electronic transactions, Paperwork requirements reduced)

I-6 To what extent did you expect the BG to increase the quality of the information you use to identify business opportunities? (*Information Quality*) (Quality of information, Better information)

I-7 To what extent did your firm have the expertise and technology to make use of the BG? (*IT Resources*)
(Employee computer experience, existing hardware and software, Computer maintenance, Employee computer skills)

I-8 To what extent, would you have acquired similar services from a commercial "non-subsidized" provider if the BG were not available (recognizing that BG services were modestly subsidized)? (*Financial Resources*)
(Available financial resources for EC, Impact BG costs, Computer costs)

I-9 To what extent, was your firm's participation in the BG based on pressure from your customers? (*Customer Pressure*) (Pressure from customers)

I-10 To what extent, was your firm's participation in the BG based on pressure from your competitors? (*Competitor Pressure*) (Pressure from competitors)

I-11 To what extent did you expect the BG to improve fairness for your firm in bidding for government and commercial contracts? (*Fairness*) (Improved fairness of bidding process and winning bids)

I-12 To what extent did you expect the BG to assist your firm in developing cooperative relationships with customer firms? (*Partnership with Customers*) (Cooperation with customers, Pooling of resources, Sharing of information, Business partnerships, Joint ventures)

I-13 To what extent did you expect the BG to assist your firm in developing cooperative relationships with competitor firms? (*Partnership with Competitors*) (Cooperation with competitors, Pooling of resources, Sharing of information, Business partnerships, Joint ventures)

APPENDIX B: PROTOCOL FOR INTERJUDGE AGREEMENTS

Introductory Explanation of the BG and judging procedures given to judges.

You are being asked to judge the qualitative results of transcribed interviews of either the owner or manager, from seventeen small firms belonging to the Business Gateway (BG). The purpose of evaluating the BG was to determine the degree of integration of Electronic Commerce (EC) Technologies within small firms using EC technologies for the first time within a network of similar small firms. The BG was established as a public/private non-profit partnership offering small businesses an Internet-based, computer information and transaction system that would serve as new sources of business opportunities. The BG provides these small firms with computer bid matching services. Bid Matching allows firms to receive Request of Quote's (RFQ's) or Request for Bids (RFB's) filtered by keywords from a Value Added Network (VAN). The BG contributes modest financial and administrative support to member firms in the form of subsidized Internet access rates, training and proprietary software.

The researchers selected seventeen firms who had participated in the BG network for one year. These firms represent the printing, advertising, manufacturing, construction, and IT service industries. A structured interview protocol made up of 17 open questions, including probes, was used to evaluate factors influencing integration of EC technologies. Based on the narrative responses developed during the interview process, you have been given transcribed interview narratives in order to form judgments to more quantitatively examine the participation of these firms in the context of the BG. This protocol for interjudge agreements was developed based on the 17-item structure interview questionnaire. You are requested to read each of the 17 questions from the structured interview, its corresponding interview narrative, and then, circle a value of either HIGH or LOW for each question that best characterizing the situation outlines in the narrative for each respondent. We recognize that it is sometimes difficult to make a determination of HIGH or LOW, therefore if you can not make a determination please circle 'the cannot make a determination'. We thank you for your assistance.

Criteria D-1 (Identify Customers)

- Low - Use bid matching results infrequently to identify customers
- High - Use bid matching results frequently to identify customers

Criteria D-2 (Access Customer Requirements)

- Low - Rarely or never review bid matching or winning bid information in determining customer requirements
- High - Periodically review bid matching or winning bid information in determining customer requirements

Criteria D-3 (Prepare & Respond to Customer Requests)

- Low - Rarely or never prepared a bid
- High - Periodically prepared bids

Criteria D-4 (Evaluate Process)

- Low - Rarely or never changed initial Computer Bid Matching Profile
- High - Periodically made revisions to computer bid matching profile

Criteria I-1 (Searching Costs)

- Low - Expected our ability to identify new customers to stay the same or decrease
- High - Expected to identify new customers

Criteria I-2 (Communication Costs)

- Low - Expected communication costs to stay the same or increase
- High - Expected communication costs to decrease

.Criteria I-3 (Labor Costs)

- Low - Expected labor costs to stay the same or increase
- High - Expected labor costs to decrease

Criteria I-4 (Customer Service)

- Low - Expected no change or decrease in our ability to support customers
- High - Expected an increase in our ability to support customers

Criteria I-5 (Operational Efficiency)

- Low - Expected the same level or a decrease in our operational efficiency
- High - Expected an increase in operational efficiency

Criteria I-6 (Information Quality)

- Low - Expected no change or a decrease in information quality
- High - Expected an increase in information quality

Criteria I-7 (IT Resources)

- Low - Our firm lacked the technical expertise to use the BG
- High - Our firm had the technological expertise to use the BG

Criteria I-8 (Financial Resources)

- Low - Would not have purchased similar services
- High - Would have purchased similar services

Criteria I-9 (Customer Power)

- Low - Customers did not influence our decision to participate in the BG
- High - Customers did influence our decision to participate in the BG

Criteria I-10 (Competitor Power)

- Low - Competitors did not influence our decision to participate in the BG
- High - Competitors did influence our decision to participate in the BG

Criteria I-11 (Fairness)

- Low - Bidding was as fair or less fair than before
- High - Computer bidding was fairer than before

Criteria I-12 (Partnership with Customers)

- Low - Expected no additional long-term relationships with customers
- High - Expected additional long-term relationships with customers

Criteria I-13 (Partnership with Competitors)

- Low - Expected no additional long-term relationships with competitors
- High - Expected additional long-term relationships with competitors