Strategic Relationships in a Small Business Context: The Impact of Information Quality and Continuous Quality Improvement

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*T*his study examines the performance between operational variables for small and medium-sized businesses (SMEs) within the context of interorganizational relationships. Specifically, it investigates the role of information quality and continuous quality improvement and the varying importance that SMEs place on each of these constructs. The sample consists of 134 vendors of a large university in the southwestern region of the United States. The results indicate that there is a positive relationship between information quality and continuous quality improvement with performance in SMEs. Implications for both research and practice, as well as ideas for future research, are discussed.

Keywords: interorganizational relationships, firm performance

Introduction

Much of the past research on strategic alliances has focused on multinational companies with diverse and complex operations (Franco, 2003; Das & He, 2006; Kelly, 2007). However, in the current business environment these partnerships have become important for all types of businesses, and more research is warranted in the small business arena (Kelly, 2007). Small and medium-sized businesses (SMEs) are often more entrepreneurial in nature and can vary greatly from large companies. According to Das and He (2006), these differences can be both intrinsic and extrinsic in nature, and must be accounted for when attempting to identify prospective partners for strategic relationships.

To remain viable SMEs often work with other organizations through a variety of collaborative efforts to achieve greater performance and stay competitive (Astley & Van de Ven 1983; Nooteboom, 2000). These coordinated efforts can come in the form of networks, joint ventures, strategic alliances, or other types of interorganizational relationships that allow for the sharing of information, resources, and risk (Das & He, 2006; Li & Qian, 2007). Accordingly, the nature of the relationships among SMEs can be unique and often more varied than the traditional alliances of large corporations, particularly in terms of innovation, bargaining power, resource allocation, learning ability, and organizational capability (Das & He, 2006; Li & Qian, 2007).

Fortunately, many SMEs are often well suited to participate in strategic alliances. Some of these advantages include centralized decision making, flexibility, limited organizational structure, and a focus on sustainability and growth (Gélinas & Bigras, 2004; Das & He, 2006). In addition to suitability, SMEs often need the benefits that come from outside networks to compensate for resource limitations and inadequate internal infrastructure.

These constraints have been well documented as primary obstacles to new firm development and growth. While emerging SMEs are particularly susceptible to these restrictions, more established firms also struggle to find appropriate business networks. Interestingly, Dodge and Robbins (1992) and Harris, Grubb, and Herbert (2005) found that external problems are more prevalent in the development stage of a small business as it attempts to develop legitimacy and find its niche in the marketplace. This seems to indicate that strategic alliances can be especially beneficial for nascent entrepreneurs. Research has shown that the development of long-term relationships with other organizations can increase the viability and survival for small businesses (Aldrich & Auster, 1986), and the absence of such relationships may contribute to higher failure rates (Baum, Calabrese, & Silverman, 2000).

The purpose of this study is to investigate interorganizational relationships in SMEs, and the impact of operational variables on internal performance. Specifically, our goal is to examine the relationship among information quality and continuous quality improvement with performance in SMEs. A model of the relationships can be found in Figure 1.
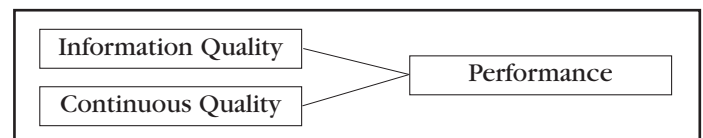

Figure 1. Information Quality, CQI and Performance in SMEs

Literature Review
Small Business

Past research (Saunders, 1997; Fuller & Lewis, 2002; Das & He, 2006; Kelly, 2007; Li & Qian, 2007) has encouraged small

business owners to develop mutually beneficial relationships with external constituencies to effectively compete with larger firms. SMEs are often faced with resource limitations that cause them to be vulnerable to various environmental changes. The adoption of relationship strategies to develop both formal and informal strategic alliances can be critical to sustain external relations and adapt effectively to the constant change that exists in the business world.

One such advantage of strategic relationships is the ability for SMEs to develop further a core competency. As suggested by Li and Qian (2007), effective alliances can help SMEs become more innovative by focusing efforts on specific ideas and concepts. These alliances can also help reduce resource constraints and provide opportunities for growth and sustained value creation. An advantage of many SMEs, particularly emerging businesses, is that they are able to adapt quicker than their larger counterparts and often have a culture based on openness and trust.

Another advantage is the access to additional resources and learning opportunities that can translate into cost reductions and greater future performance (Beekman & Robinson, 2004). As stated by Sawhney and Zabin (2002), business-to-business relationships can create value networks that make up a "business ecosystem" (p. 315). This ecosystem can provide benefits that enhance the competitive advantage for all parties involved. Basu (2001) argues that it is imperative for businesses to share knowledge and best practices if they are to succeed in a collaborative economy. Empirical research (O'Farrell & Wood, 1997; Kelly, 2007) has shown the value of professional networks in developing and refining capabilities and capacity. Specially, SMEs can gain cost and service advantages and greater flexibility from strategic relationships, and these improvements are likely to strengthen their overall competitive advantage (Miller, 1988; Kelly, 2007).

The establishment of strategic alliances alone is not enough. To reap the benefits of these relationships all parties involved must gain value from the association. Research has shown that owners of SMEs often look for partnerships with businesses that offer a complementary contribution and a shared agreement of fundamental values and trust (Hoffman & Schlosser, 2001). Similarly, Saunders (1997) and Fuller and Lewis (2002) argue that SMEs should seek out organizations in which they can develop mutually beneficial relationships. According to Das and He (2006), the best strategic relationships for entrepreneurial businesses are based on compatible motivations, access to complementary business functions, and involvement and commitment from all levels of the organization. They also highlight the importance of developing purposeful relationships and acting in a timely manner to secure commitments.

SMEs need constantly to identify ways to lower costs, increase productivity, and strengthen their competitive advantage (Mentzer, DeWitt, Keebler, Min, Nix, & Smith, 2001; Das & He, 2006). Likewise, researchers continue to examine all types of variables in relationship to SME performance, including both relational and operational variables. In terms of operational variables, information quality (Huber & Daft, 1987) and continuous quality improvement (Deming, 1975; Prybutok & Ramasesh, 2005) are two of the more important aspects of interorganizational relationships that can affect firm performance. Additional research on these variables is needed to better understand their impact in the small business context.

Information Quality

Information quality has been defined as the degree to which the information received from another is accurate, timely, complete, adequate, and credible (Daft & Lengal, 1986; Huber & Daft, 1987; Monczka, Peterson, Handfield, & Ragatz, 1988). Information exchanged between parties must be systematically available for the effective completion of required tasks (Guetzkow, 1965) and interorganizational success is often somewhat dependent on effective and efficient communication (Huber & Daft, 1987). This exchange of information can predict the success of the partnership of the actors (Devlin & Bleakley, 1988).

In supply chains, companies find reduction in costs and better utilization of resources by utilizing continually advanced systems in information flow (Gopal & Cypress, 1993; Martin, 1995). Through more advanced exchanges of information, the transaction between members can be much quicker (Murphy, 1998). These benefits are becoming more available to companies through technological advancements that facilitate these exchanges, and thus enable greater performance (Stefansson, 2002). For example, the prevalence of off-the-shelf, Web-based integrated inventory management systems (like those that combine point-of-sale systems with automated inventory ordering) have made it possible for organizations not only to track orders and process receipts, but also to communicate and manage inventories in real time with their vendors. This better and more complete information allows firms to plan key variables, such as capacity of the supplier, which creates a more efficient chain (Chapman & Carter, 1990; Raturi, Meredith, McCutcheon, & Camm, 1990). Ellram and Hendrick (1995) found in their study on supply chain relationships, that partnering organizations continually share information needed for mutual understanding, operational information necessary for smooth operations, and information regarding high corporate-level issues important for good coordination.

When applying path-goal theory (House, 1971) to the interorganizational relationship and the exchange of information, the leader, or the buyer in this sense, must provide the supplier with the information of what exactly is to be expect-

ed. When looking at SMEs, the level of quality information at the beginning of the exchange as well as throughout the transaction must be thorough. Thus, it is expected that when SMEs receive more meaningful and timely information there will be a greater opportunity to perform well. Therefore, the following hypothesis is given:

Hypothesis 1: A positive relationship exists between perceived information quality and performance for small and medium-sized businesses.

Continuous Quality Improvement

Continuous quality improvement (CQI) is the process within organizations that seeks higher quality within an organization that will lead to better products and services with lower defects and with lower costs (Deming, 1975; Prybutok & Ramasesh, 2005). There are three primary elements of CQI within this definition. First is the quality of data and information gathered internally within the organization. Second is the use of the internal and external quality data by the organization. Third is the quality documentation by the organization internally. Pence (1993) emphasizes the need for suppliers to adhere to and follow the paths toward quality improvement to maintain strong relationships with partnering and collaborating organizations.

Prior research has indicated that quality practices within an organization are statistically significantly related to success within that organization. Just two of these quality practices that lead to success are service quality (Magal, 1991; Rands, 1992; Ferguson & Zawacki, 1993), and system quality (Davis, 1989). The benefits of CQI are lower costs, information accuracy, and lowers defects. Within the interorganizational setting, CQI is seen as a capability because it suggests that the processes and systems exist to carry out the organizations' tasks with a minimum of waste more effectively and efficiently. It is expected, however, that SMEs are more concerned with continuing the CQI process. SMEs, with spread-out resources and commitments, rely on CQI to improve their ability to meet each of their buyers' needs. Therefore, in this context, it is expected that these organizations will see CQI as positively related to firm performance. Thus, the following hypothesis is given:

Hypothesis 2: A positive relationship exists between continuous quality improvement and performance for small and medium-sized businesses.

Methodology
Sample

An electronic survey was administered via email to the approved vendors for a large university in the southwestern United States. The respondent for each vendor was the pri-

mary contact for the university and vendor. Of the 498 accessed surveys, 156 surveys were completed indicating a 31 percent response rate of those accessing the survey. Of the 156 completed surveys, there were 134 usable surveys that were considered an SME with fewer than 500 employees after removing those cases with low response rate. The average size firm is 34 employees.

Measures

Participants were asked to specify the size of the organization by giving the number of employees (Kimberly & Evanisko, 1981). As has been mentioned earlier, the size of the organization can impact the relationship between the supplier and the buyer (Redondo & Fierro, 2007). In addition, respondents were asked for the number of years the organization has been a vendor to the university to assess the degree of institutionalization, which can potentially affect the vendor's ability to respond to customer demands (Dimaggio & Powell, 1983). The average length of time the organization had been working with the university is 6.39 years. They were also asked to indicate the length of time that he or she has worked with the organization to help indicate the person's tendency to observe, accept, and adopt the values and norms of the organization (Chao, O'Leary-Kelly, Wolf, Klein, & Gardner, 1994). The average length of time the respondent had been working with the company is 9.49 years.

Information quality was examined using five dimensions of information—accuracy, timeliness, adequacy, completeness, and credibility (Daft & Lengal, 1986; Huber & Daft, 1987; Monczka et al., 1998). If one of these items proved not to be ranked high, the quality of information may not be as good. For example, if information comes in too late that a certain product has changed, the supplier may use the wrong product in servicing the buyer. Thus, the information is no longer useful. Using Mohr and Spekman's (1994) five questions on information quality (previous $\alpha = .910$), respondents indicated their level of trust on a seven-point Likert-type scale ranging from (1) not timely (accurate, adequate, etc.) to (7) very timely (accurate, adequate, etc.).

Continuous quality improvement (Deming, 1975; Prybutok & Ramasesh, 2005) consists of three factors: quality data and information gathering, quality internal and external data usage, and quality documentation. These factors were assessed using an adaptation of Prybutok and Spink's (1999) seven items for continuous quality improvement (previous $\alpha = .852$). These seven items were tested using a seven-point Likert type scale with responses ranging from strongly disagree (1) to strongly agree (7).

The items assessing performance were designed specifically for this study. They were developed through an examination of the literature and based on the expectations of the business relationship as determined by the buyer. Specifically, supplier

firms as well as multiple buyers in more than one industry were questioned to determine items that would accurately assess performance in this type of relationship. The survey was then developed and examined by researchers as well as those in practice with changes made that were necessary. After a pilot study on suppliers to a global telecommunications firm resulted in good results, the survey was determined usable for this survey. These items are tied to the definition of performance as well as those areas that the supplier must monitor for quality performance for the buyer. These seven items assessed performance in areas such as on-time delivery, full compliance with buyer's requests, properly correcting all problems or mistakes prior to acknowledging completion of the work order, and using approved products and procedures. These items were measured using a seven-point Likert scale ranging from strongly disagree (1) to strongly agree (7). The following paragraph describes how the reliability of these items were determined.

Data and Scale Analysis

The data were screened and prepared using Kline's (1997) recommended procedures. After a full analysis, cases with missing data points, as well as outliers identified with the frequency distribution of standard scores, were removed. Univariate normality was assessed by examining each item for skewness and kurtosis. The test showed a normal distribu-

tion. Cronbach's alpha was used to establish the reliability of the scales (Nunnally & Bernstein, 1994; Henson, 2001). The coefficient alpha's for each scale was well above Nunnally and Bernstein's (1994) suggested reliability coefficient of .70. These reliability estimates are found in Table 1.

The item scores were assessed to evaluate the consistencies of the measurement items with construct validity. Utilizing a confirmatory factor analysis (Ahire & Deveraj, 2001), LISREL was used to examined the latent variable with its corresponding items. The latent constructs were analyzed using principle components factor analysis to extract the analysis pattern. Using the K1 rule (Kaiser, 1960), each item extracted only one factor. Therefore, there is only one latent construct per list of variables (Hattie, 1985). The factor pattern/structure coefficients as well as the commonalities, eigenvalues, and Cronbach's alphas are presented in Table 1. A LISREL model assessed the fit of the individual items with the latent construct. Examining the fit indices allows for a test of discriminant validity. The analysis shows that the scale reliabilities are sufficiently larger than the correlation averages with other constructs, the interscale correlations are not perfectly correlated, and the variances extracted are greater than the squared intercorrelations of the latent variable. This does indicate a good fit. The results of the analysis are found in Table 2. In addition, the overall means, standard deviations, Cronbach's alphas, and correlations of the latent variables are found in Table 3.

Table 1. Factor Pattern/Structure Coefficient for All Constructs						
Variable Item #	*Information Quality*		*CQI*		*Performance*	
	Factor	h^2	*Factor*	h^2	*Factor*	h^2
1	.847	.717	.846	.716	.792	.627
2	.964	.929	.867	.752	.794	.631
3	.930	.865	.864	.747	.863	.745
4	.958	.918	.847	.718	.828	.686
5	.906	.821	.801	.641	.866	.749
6	n/a	n/a	.916	.839	.769	.591
7	n/a	n/a	.900	.810	.864	.747
Total Variance Explained	84.911		74.458		68.364	
Initial Eigenvalue	4.250		5.223		4.777	
Second Eigenvalue	.347		.684		.579	
Alpha	α = .955		α = .943		α = .922	

Results

The purpose of this study is to examine the relationship of both information quality and continuous quality improvement with performance in SMEs. Hypothesis 1 states that there is a positive relationship between information quality and performance in SMEs. In addition, hypothesis 2 states that there is a positive relationship between continuous quality improvement and performance. The hypotheses were tested by first entering control variables of organizational size, number of years with the company, number of years working for the buyer, and number of years working as a manager for this company. Following this, both information quality and continuous quality improvement were entered into the regression model.

The first model with only the control variables resulted in an ANOVA with an F statistic of .182 that was not statistically significant ($p > .05$). The second model, which includes both the control variables as well as information quality and continuous quality improvement, was statistically significant with an ANOVA with an F statistic of 18.579 ($p < .05$). These two predictor variables improved the fit of the model with an R^2 of .421, an adjusted R^2 of .398, and an $\alpha R^2 = .416$ that was statistically significant ($p < .05$). In addition, the relationship of the predictor variables with performance was examined using standardized and unstandardized coefficients, statistical significance, and confidence intervals. Table 4 presents a summary of these results. The results of the regression analysis indicate that both information quality and continuous quality improvement are statistically significantly related to performance in SMEs ($p < .01$), thus supporting hypotheses 1 and 2.

Discussion and Practical Implications

The results of this study support both of the hypotheses indicating that SMEs' information quality and continuous quality improvement are positively related to performance. These findings not only add to the literature base, but also provide practical implications for SMEs in regards to building stronger relationships with other organizations. SMEs generally have access to limited resources and technologies needed to process information and improve operations, making it important to understand how best to develop strategic alliances that positively affect firm performance.

SMEs should focus on sharing information that allows for both relationship development and continuous quality improvement. This requires an exchange based on quantity and quality of the information, in a manner that creates trust and commitment within the partnering organizations (Hoffman & Schlosser, 2001). As suggested in prior research (Das & He, 2006; Li & Qian, 2007), strong alliances are built on sharing information and resources, thereby reducing risk for all parties involved. By sharing relevant information in a timely manner, SMEs gain more strategic flexibility that enables them to refine their capabilities and improve performance (O'Farrell & Wood, 1997; Kelly, 2007).

While continuous improvement can help SMEs better serve existing customers, it can also be used to develop new internal processes that make them less dependent on a limited customer base and more focused on future growth. As suggested by Beekman and Robinson (2004), effectiveness is important in developing a long-term customer relationship, but ineffectiveness may be more important in determining the duration of the relationship. Although it is critically important for a SME to effectively serve its current customers, it is also important to continually identify new sources for revenue and expanded capacity to maximize performance. This can hopefully allow for the creation of a competitive advantage that is sustainable, which in turn increases long-term viability (Aldrich & Auster, 1986). As suggested by Baum, Calabrese, and Silverman (2000), without such relationships, SMEs are often faced with lower growth potential and higher failure rates.

As indicated in past research (Morrissey & Pittaway, 2006; Devins, Gold, Johnson, & Holden, 2005), developing SMEs are likely to become emotionally involved with customers and learn through social interaction rather than formalized business practices. Conversely, larger SMEs with greater resources and technologies tend to become more reliant on the flow of detailed information to make business decisions and manage customer relations. The adoption of better integrated systems allows these larger SMEs to collect more information and process it quickly to handle complex transactions (Gélinas & Bigras, 2004). As SMEs grow and mature, it is important that they create formalized arrangements and strategic alliances and rely less on social factors and more on internal processes (Morrissey & Pittaway, 2006). While SMEs are generally

Table 2. Construct Fit Indices				
Construct	x^2	*d.f.*	*CFI*	*GFI*
Information Quality	3.37	5	1.0	.99
CQI	174.64	14	.89	.73
Performance	37.69	14	.98	.93

Table 3. Means, Standard Deviations, Cronbach's Alphas, and Correlations					
Construct	*Means*	*SD*	*1*	*2*	*3*
Information Quality	5.816	1.075	(.955)		
CQI	6.105	.914	.380*	(.943)	
Performance	6.228	.793	.606*	.444*	(.922)

Note: *Correlations are significant at the 0.01 level (2-tailed). Reliability coefficients are presented on the diagonal.

Table 4. Results of Simultaneous Regression Analysis for Prediction of Performance in SMEs						
Variable	*B*	*SE B*	*β*	*95% CI Lower*	*95% CI Upper*	*VIF*
Step 1						
# of Employees	.000	.001	.000	-.003	.003	1.044
Company Years	.006	.010	.051	-.014	.025	1.062
Manager Years	.003	.009	.031	-.014	.020	1.087
Step 2						
# of Employees	.000	.001	-.004	-.002	.002	1.046
Company Years	-.002	.008	-.021	-.018	.013	1.084
Manager Years	.004	.007	.046	-.009	.018	1.098
Information Quality	.381	.054	.517*	.274	.489	1.196
CQI	.212	.064	.244*	.086	.338	1.186

Note: R^2 for first model = .004; R^2 for second model = .421; ΔR^2 = .416;
*$p < .01$; N = 134; two-tailed tests.

well suited for strategic relationships due to their centralized decision making and flexible organizational structure, these businesses can vary greatly in terms of size and scope, thereby making it critically important to identify appropriate partners with a similar culture and complementary resources. Once the alliance begins information quality and continuous quality improvements become important factors in the maturation of the relationship.

Another implication from our findings is that greater interaction among firms may promote a sharing of resources (Watts & Hahn, 1993), which results in improved quality, reduced costs, and increased continuous improvement for all involved parties. In addition, partnerships based on a commitment to continuous improvement where SME organizations partner with more established organizations allow the SMEs to mitigate their lack of a track record of success and therefore reduce their overall likelihood of failure (Hudson & McArthur, 1994; Aldrich & Auster, 1986). When taken together, a competitive advantage is gained as a result of an alliance based on high-quality information and continuous improvement efforts. This competitive advantage may ultimately determine a SMEs success or failure.

Future Research
While the importance of operational variables often becomes more important as SMEs grow and mature, various social factors can also greatly impact interorganizational relationship, regardless of firm size. In particular, trust, personal values, and reciprocity can play a vital role in partner identification and relationship building (Hu & Korneliussen, 1997; Hoffmann & Schlosser, 2001). While we found that information quality is important for firm performance, additional exploration is needed to determine what communication processes work best within SMEs to allow for the flow of accurate and detailed information. These processes must allow for the flow of reliable data and in a manner that effectively serves all partners and allows for continuous improvement. Interfirm cooperation is required, particularly among SMEs, if an alliance is successful and leads to increased productivity and growth (Das & He, 2006).

Future research should also consider expanding the population of SMEs studied beyond that which is seen here. Because our sample was drawn only from vendors associated with one large university, the generalizability of our findings may be limited. By examining vendors that are of various sizes and that are associated with many different types of organizations, a more nuanced understanding of vendor-supplier relationships will emerge.

Research has shown that many influences impact business relationships and organizational performance. The intent of this study was to examine some of the predictors of performance within SMEs. We found that SMEs are dependent on information quality and well-designed internal processes for quality and performance. These findings are important for both future research and practice. However, researchers must continue to examine how other operational variables impact strategic decisions and firm performance. In addition, owners and managers of SMEs must be aware of what factors affect interorganizational relationships in order to develop best practices for exchanging information, maximizing resources, and encouraging continuous quality improvement. Additional research is particularly needed within the small business arena to better understand business-to-business relationships and professional networks and the role they play in the future success of SMEs in today's ultra-competitive marketplace.

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