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ABSTRACT

Competitive priorities are the critical operational dimensions a process or supply chain must possess to satisfy its internal or external customers. The concept of competitive priorities is very important to organizations because it helps them set up achievable goals and it has long been known to be associated with organizational performance. This research introduces an alternative theory to explain the mechanism by which the buying firms and suppliers adopt different competitive priorities as they enter into buyer-supplier relationships and to explore further how technology choices influence the competitive priority adaptation. Using empirical data collected from the Society of Manufacturing Engineer's executives, a confirmatory factor analysis was used to refine the measurement. The measures were refined to satisfy key measurement rigors including convergent validity, discriminant validity, and reliability. The structural model results show that suppliers' adaption of competitive priorities and IT use is largely influenced by buyers' level of competitive priorities and IT use; however, there is no clear relationship pattern relating to suppliers' competitive priorities and IT use.

INTRODUCTION

Competitive priorities are the critical operational dimensions a process or supply chain must possess to satisfy its internal or external customers, both now and in the future (Krajewski, Ritzman, & Malhotra, 2013). The concept of competitive priorities is very important to organizations because it helps set up achievable goals when implementing corporate plans into operational plans. The competitive priorities help organizations set the right course of actions for process selection. When process capabilities fall short of the predetermined competitive priorities, they must be re-determined and re-focused to close the gap or else revise the priority. There are five common groups of competitive priorities namely *cost, quality, time*, *flexibility* and *innovation*. Finding the right competitive priorities does not happen overnight, many companies struggle for years when making decisions regarding different competitive priorities. Nowadays, large organizations such as Wal-Mart employ information technology (IT) to help achieve competitive priority strategy. Wal-Mart embraced the Retail Link System technology (a mammoth database located in Bentonville, Arkansas) to become an innovator in the way stores track inventory and restock their shelves. Through a global satellite system, Retail Link is connected to analysts who forecast supplier demands to the supplier network, which displays real-time sales data from cash registers and to Wal-Mart's distribution centers. In the buyer-supplier relationships, information technology is changing the way organizations operate. The competitive priority strategy of Wal-Mart provides a good example to describe how organizations' technology selection may affect the changes in competitive priorities.

Technology selection is an imperative decision for organizations to gain competitive advantage over their rivals. Organizations must choose the right technology to either achieve low cost operations or find ways to differentiate themselves through the latest innovation. Firms choose to implement information technology (IT) to connect with customers, enabling them to recognize individual preferences, tailor products accordingly, produce in a timely manner, and sell at a reasonable price (Sophie Lee et al., 2000). Through information networks, organizations work closely with suppliers, sharing accurate and timely information (Tracey et al., 1999; Dean et al., 2009). Unfortunately, current literature provides limited support for what constitutes IT selection and how it affects competitive priorities and eventually organizational performance.

Although there are several attempts to understand the link between IT selection and competitive priorities, opportunity remains to extend scholarly research to delineate the relationships between IT selection and competitive priorities within the buyer-supplier relationship. The intention of this research is to formulate general ideas portraying how IT selection relates to competitive priority adaptation and in turn leads organizational performance. There has not been much research for this attempt; therefore, this research should be considered exploratory in nature. Hopefully, the results will be useful to provide a new platform for practitioners and academicians trying to have a deeper understanding of competitive priorities.

In the next section of the paper, the literature on competitive priorities and IT selection will be reviewed. Based on the literature, the conceptual model will be developed and research hypotheses will be discussed. The data is gathered using a questionnaire survey. Rigorous research methodologies will be employed to ensure measurement reliability and validity. The structural equation modeling (SEM) will be used to test hypotheses. The results will be presented along with implications.

LITERATURE REVIEW

Competitive Priorities and Competitive Priority Measures

Regarding the measurement of competitive priorities, there is broad agreement that competitive priorities can be expressed in terms of at least five basic components: *low cost, quality, delivery time, flexibility, and innovativeness* (e.g., Fine & Hax, 1985; Wheelwright, 1984; Leong, Snyder, & Ward, 1990; Ferdows & De Meyer, 1990; Vickery, 1991; Vickery et al., 1993). Especially, Leong, Snyder, and Ward (1990) reported *innovativeness* as the fifth competitive priority; however, innovativeness has not been operational as a competitive priority in empirical study in their study. Vickery, Droge, and Markland (1994) developed a system to assess reliability and validity of the measures used to assess the various competitive priorities. Youndt et al. (1996) used cluster analysis to analyze 97 manufacturers across four manufacturing strategies orientation which is later known as competitive priorities (*quality, delivery flexibility, scope flexibility, and cost*). Though their main objective was not to develop or test any taxonomy of manufacturing strategy, their findings have a bearing on competitive priority research. Their findings yielded five groups of manufacturers, which they labeled by the emphasis on corresponding manufacturing strategies as: (1) *quality emphasis*, (2) *cost and quality emphasis*, (3) *cost, quality, delivery and delivery flexibility and scope flexibility emphasis*, (4) *quality and delivery flexibility emphasis*, and (5) no strategic emphasis. However, they did not find these strategy clusters to have any direct impact on manufacturing performance. Ward et al. (1998) discussed important dimensions to evaluate the extent of competitive priorities using factor analysis. In their study, *Cost Importance* competitive priority includes production costs, labor productivity, capacity utilization, reducing inventory, cost and productivity; *Quality Importance* competitive priority includes high product performance, high product durability, high product reliability, ease to service product, promptness in solving customer complaints, and conformance to design specs; *Delivery Time Importance* competitive priority includes short delivery time, delivery on due date, reduced production lead time, on-time delivery, and production cycle time; and *Flexibility Importance* competitive priority includes large number of product features or options, new products into production quickly, rapid capacity adjustment, and design changes in production.

Jayaram et al. (1999) examined the linkage between human resource management practices and four dimensions of competitive priority – *quality, cost, flexibility, and time*. Santos (2000) identified human resource management policies appropriate for each of the four competitive priorities. In the study, competitive priority includes *Cost* (to offer products and/or services with the lowest price), *Quality* (to offer with high performance, to differentiate products from competitors, to delivery appropriate technical assistance, to build and improve products and company image, and to improve products reliability and durability), *Delivery performance* (to manufacture products with agility, to warrant reliability of delivery deadline, to provide technical assistance services with replacement parts), and *Flexibility* (to change product designs or to launch new products quickly, to offer a broad product mix, and to change the production volume quickly). Frohlich and Dixon (2001) added *Service* as the fifth variable to measure competitive priority in addition to *Price*, *Quality*, *Delivery*, and *Flexibility*.

Makadok (2001) defined capabilities as special types of resources that can enhance productivity of other resources. *Low cost, high quality, reliable, fast delivery* and *product mix* (variety and volume) are considered to be the most essential capabilities (Wheelwright, 1984). Ahmad and Schroeder (2003) investigated the impact of seven human resource practices on an aggregate operational performance measure, and examined whether the use of these practices differed by country or industry. Diaz et al. (2005) investigated the relationship between competitive priorities and performance of investment in AMT (advanced manufacturing technologies) in different organizational size. In their study, *costs* (inventory reduction, increase in utilization of capacity, reduce production costs, and increase in labor productivity), *quality* (to offer high performance products, consistent quality with low defect rate, and to offer reliable products), *deliveries* (reduction of lead times, fast deliveries, and meet promised delivery times), and *flexibility* (fast introduction of new products, fast changes in design, adjust capacity quickly, fast volume changes, offering a wide variety of products, and fast changes in product mix) were used to measured competitive priority. Peng et al. (2010) defined competitive priorities as a strategic emphasis on developing certain intended competitive capabilities such *cost, quality, delivery* and *flexibility*.

In 2011, Prajogo and McDermott modified competitive priorities from previous studies and developed a new set of priorities consistent with a service setting. Their priorities comprised of *conformance to specification, service innovation, customer retention, speed, service delivery, responsiveness, brand image, cost effectiveness, productivity, and service recovery*. Saarijarvi et al. (2012) used a pairwise comparison method to assess competitive priorities within the supply chain. They introduced a case study of a supply chain within the packaged food industry to illustrate the assessment. In the study, six competitive priorities were employed including *cost efficiency, speed, reliability, innovativeness, flexibility,* and *collaboration.* Kruger (2012) studied the strength and importance of competitive priorities for South African businesses using five dimensions including *quality, cost, speediness, dependability,* and *flexibility*.

The literature review shows that the measurement of competitive priorities is well documented. Following the majority of previous studies, the current study proposes five dimensions to capture the concept of competitive priority which include (1) *cost leadership*, (2) *product quality*, (3) *delivery reliability*, (4) *process flexibility*, and (5) *innovation*. The context of this study is a manufacturing environment; therefore, the concept of competitive priority is reported for both buying firms and suppliers. See Appendix A for detailed items.

IT Selection

IT selection is defined as technology choices organizations choose to affect changes in the supply chain. Based on the literature, IT selection can be categorized into three groups based on how it is utilized namely (1) strategic, (2) operational, and (3) infrastructural.

IT can have a strategic role and a direct and favorable impact on value creation by building linkages with a firm's customers and suppliers (Soroor et al., 2009) that lead to better products, enhanced productivity, higher quality, better equipment utilization, reduced space needs, and increased flexibility (Kim & Narasimhan, 2002). Porter and Millar (1985) asserted that IT use has a significant influence on activities of the firm by creating more value for customers, integrating information and material flows, and facilitating the development of new value chains. In the current study, the term Planning IT use portrays how well an organization uses IT for strategic reasons such as long-term planning, proactiveness and internal and external analysis. Planning IT use is the extent to which a firm uses IT to formulate, justify, and improve long-range business planning and decision making (Jitpaiboon, Ragu-Nathan, & Vonderembse, 2006).

Operational IT use is the extent to which a firm uses IT for monitoring, justifying, improving, and controlling day-to-day operational decision processes (Sabherwal & Chan, 2001; Jitpaiboon, Ragu-Nathan, & Vonderembse, 2006). This captures IT use for value creation activities (Narasimhan & Kim, 2001). Operational IT usage promotes the improvement of daily operations the meet operational goals. Narasimhan and Kim (2001) proposed measuring information systems (IS) utilization with three sub-constructs: (1) IS for infrastructural support (e.g., accounting information systems and office information systems); (2) IS for value creation management (e.g., production plan and process control, sales and price management, and inventory and warehouse management), and (3) IS for logistical operations (e.g., transportation management, automatic ordering, and warehouse location selection).

Infrastructural IT use is the extent to which a firm uses IT to facilitate information sharing and data communication, recommend standards for IT architecture, implement security, and coordinate work activities (Jitpaiboon, Ragu-Nathan, & Vonderembse, 2006). In this study, the Infrastructural IT use consists of two major components: Data Integration and Network Integration (Wyse & Higgins, 1993; Bhatt, 2000). Data Integration deals with standardization of data, definitions, formats, and presentations of information. Network Integration involves system connection and communication tools, information sharing, and network infrastructures.

Buyer performance

Buyer performance (BP) is the extent to which a buying firm fulfills its market and financial goals. Wisner (2003) studied the effects of supply chain management strategy on BP, which can be measured by market share, return on assets, overall product quality, overall competitive position, and overall customer service level. BP is a key outcome measure given that a firm's manufacturing capabilities such as cost, quality, flexibility, and delivery can be linked to its competitive priorities (Taps & Steger-Jensen, 2007). Rosenzweig et al. (2003) used four items to measure business performance including pre-tax return on assets, percentage of revenues from new products, overall customer satisfaction, and business unit sales growth. Frohlich (2002) used two items to measure e-business performance: annual percent of procurement using the Internet and annual percent of sales/turnover using the Internet. Narasimhan and Kim (2002) used sales growth and market share growth with a three year look-back, profitability, return on investment, return on assets, revenue growth, financial liquidity, and net profit to measure BP. With concern for rigor and consistent with previous scholarly work, herein BP is measured by customer retention rate, sales growth, return on investment, production throughput time, and overall competitive position. See Appendix A for detailed items.

The next section of this paper discusses the theoretical framework and hypotheses. The following section describes research methodology. The subsequent section presents the results, and the final section discusses the implications of the research findings for researchers and practitioners.

COMPETITIVE PRIORITY ADAPTATION FRAMEWORK FOR IT SELECTION AND HYPOTHESES

Competitive Priority Adaptation Framework

The topic of competitive priorities was first brought about in operations management by Skinner (1969). Skinner identified competitive priorities for two furniture manufacturers as one manufacturing a low-cost product line and the other making high-price, high-style furniture. He stated that the two manufacturers would need to develop different policies, personnel, and operations to be able to carry out their strategies successfully. Early researchers in manufacturing strategy (Wheelwright, 1984; Skinner, 1985) considered the competitive priorities to be mutually exclusive. They maintained that a manufacturer has to choose between conflicting competitive priorities, such as delivery and flexibility. Skinner (1996) later accepted the notion that choosing competitive priorities could be dynamic. He maintained that some trade-offs do exist such as between quality and cost. The concept of manufacturing trade-offs is now being challenged. Based on a study of Japanese manufacturers, Nakane (1986) noted that they were developing manufacturing competitiveness through the progressive build-up of capabilities: by developing, first, quality as the foundation capability, followed by dependability, then cost and, lastly flexibility. Then, while Nakane's observation concerned how the Japanese were competing, Hall (1987) suggested that manufacturers should pursue a step-wise progression through the capabilities, and offered as a typical goal progression: quality improvement; dependability; cost reduction; and then flexibility. Ferdows and De Meyer (1990) investigated both the trade-off model and the cumulative model using data from the European Manufacturing Futures Project. While finding the evidence somewhat inconclusive, they rejected the trade-off model and cited some support for a cumulative model. Formally proposing a cumulative model for lasting improvements (referred to as the "sand cone" model), they suggested that the order and manner in which manufacturing capabilities are built can change the nature of trade-offs, so that one capability is not necessarily at the expense of another. The sand cone model starts with quality at the base, followed by dependability, flexibility and then cost-efficiency, differing slightly from the order suggested by both Nakane and Hall. Safizadeh et al. (2000) observed that different patterns of trade-offs exist in plants with different production processes. Pagell et al. (2000) found the existence of trade-offs at higher levels, as well as evidence of simultaneous improvements along multiple competitive dimensions. Boyer and Lewis (2002) found no trade-off between quality and cost, but asserted that some other trade-offs between competitive priorities still remain. Swink et al. (2005) stated that "a growing literature suggests that capabilities are mutually reinforcing or cumulative". Recognizing this trend, this research pursues multiple competitive priorities simultaneously.

Currently, the previous literature suggests two models explaining the dynamic of changing competitive priorities organizations experience. The first model so called "Trade-Offs" model suggests organizations may progress from one competitive priority at the lower level to the higher level one (Wheelwright, 1984; Skinner, 1985; Skinner, 1996). This suggests typical organizations such as Wal-Mart start out by offering products at low cost to customers and then eventually when opportunities present, they pursue the higher level priority by offering higher quality and highly customized products. With the new competitive priority, the organizations will no longer be interested in offering the products at low cost. The trade-offs model implies that organizations must choose one specific priority over another in a progressive manner. This is also supported by Hall and Nakane (1990) who suggested organizational competitive priority progressively evolves from quality improvement to dependability to cost reduction to flexibility to a company-developed culture to innovation. The second model so called the "Sand Cone" model suggests the selection of competitive priorities is mutually reinforcing or cumulative (Swink et al., 2005; Nakane, 1986; Hall, 1987; Ferdows & De Meyer, 1990). The theory explains organizations may start out at the lower end of competitive priorities and progressively build up to the higher end in a stepwise manner. Ferdows and De Meyer (1990) suggested the organizational competitive priority starts with quality at the base, followed by dependability, flexibility, and then cost-efficiency. The sand cone model implies one capability is not necessarily at the expense of another; therefore; organizations such as Wal-Mart may choose to offer high quality and customized products and somehow manage to offer at a reasonable price comparable to competitors.

Both theories are legitimate depending on different circumstances (e.g., products, type of organizations, technologies, and etc.). For example, the sand cone model can be used to explain how Dell Computer can offer both highly customized laptop computers with consistent quality and still manage to be competitive on price. On the other hand, the trade-offs model can possibly be used to explain the product offerings at Best Buy. Best Buy is less likely to offer low cost products when customers demand high quality and customization. Although both models are equally important in explaining competitive priority adaptable within organizations; the theories lose their integrity when dealing with supply chain relationship. In both trade-offs and sand cone models, the competitive priority dynamism in buyer-supplier relationship is not taken into account. In the supply chain environment, organizations commonly form cooperative relationship with each other. Manufacturing firms or Buyers, commonly a large enterprise, are at the forefront when initiating and implementing buyer-supplier relationships (Harrison, 1992; Blenckhorn & Noon, 1990; O'Neal & Bertrand, 1991). Buyers are more likely to form stronger relationships with suppliers through greater purchasing power as they are mainly interested in minimizing risk by using single or dual-sourcing (Sinclair, Hunter, & Beaumont, 1996). As a result, buyers are likely to initiate changes from one competitive priority to another and use purchasing muscle to force changes to suppliers as a contractual condition (Lascelles & Dale, 1989). In typical situations, buyers force their suppliers to implement new processes and invest in new technologies such as e-commerce, ERP systems, flexible machines, and CAD equipment just to maintain equivalent level of competitive priority (Matthyssens & Bulte, 1994). Suppliers seldom take a proactive role in initiating or implementing a new priority (Bertrand, 1986). Rather they concentrate on complying with buyers' requirements in order to remain in the shrinking supplier base. To better explain the competitive priority mechanism in the buyer-supplier relationship, this study proposes an alternative model called *Influential Adaptation Model.* Influential adaptation model provides a broader theory to explain how a buyer firm's competitive priority can influence a competitive priority of a supplier. Figure 1 shows influential priority adaptation framework.

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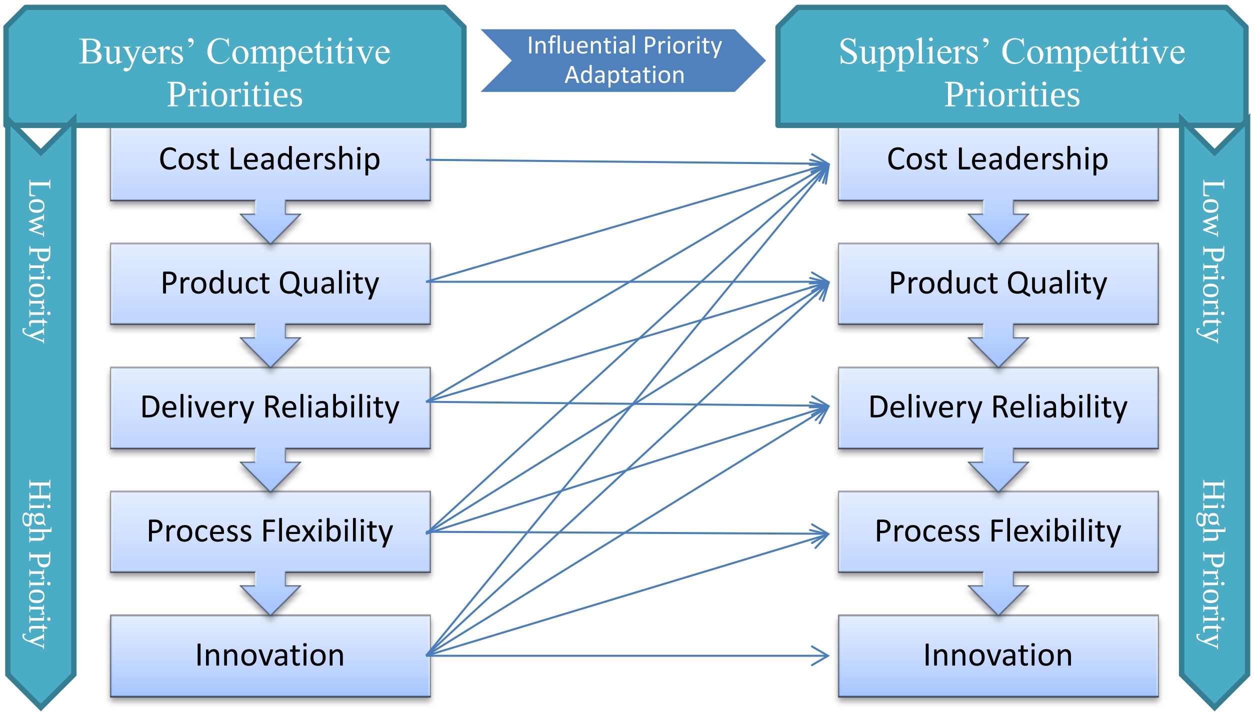
Figure 1: Influential Adaptation Model of Competitive Priorities.

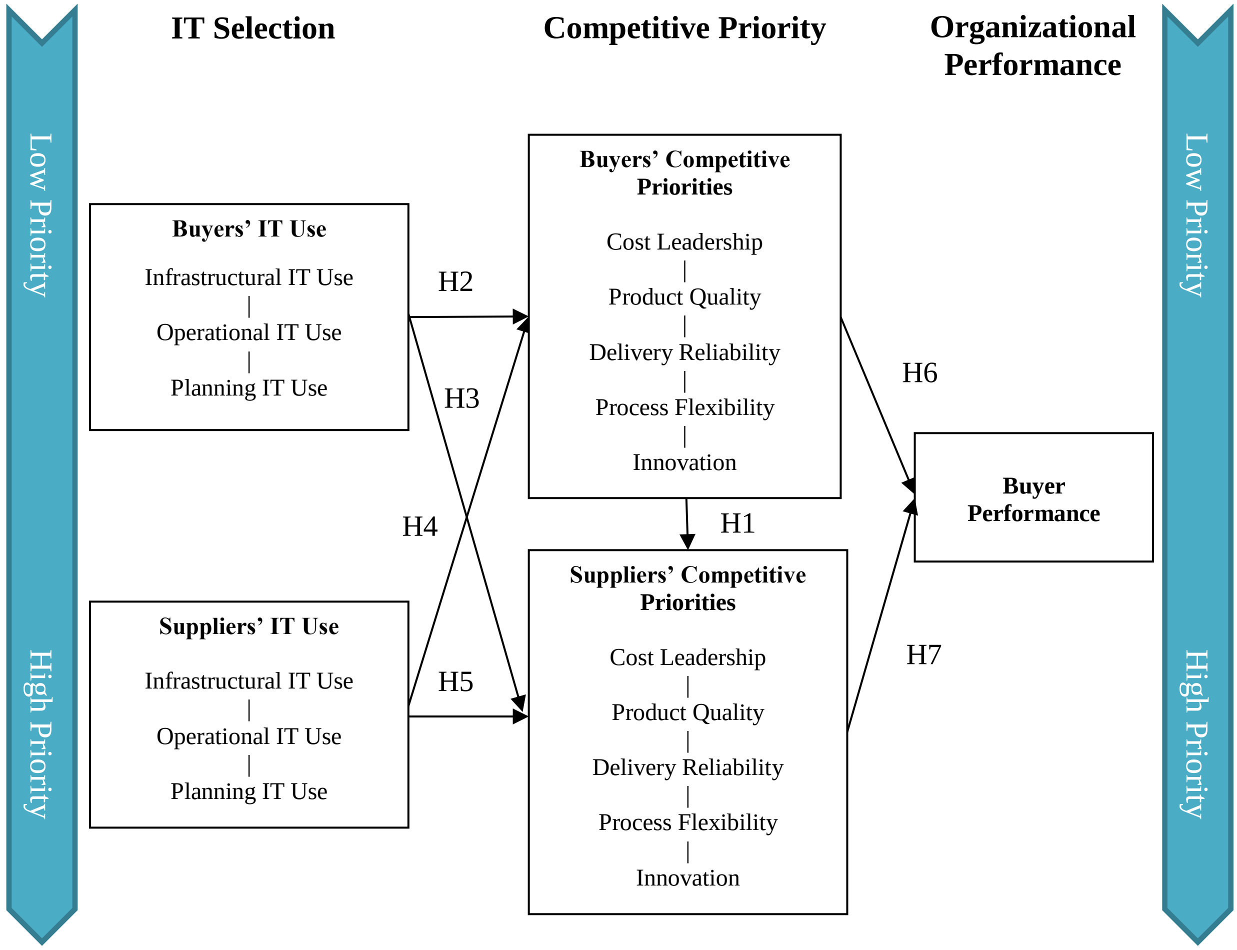


Recently, some scholars have suggested that a supply chain relationship between buyers and suppliers should be seen as a distinctive resource or capability. Buyer-supplier relationship developed over time could become the basis of a rich information network, thereby enabling firms to form new alliance opportunities with reliable suppliers (Gulati, 1995; Powell et al., 1996). A firm's competitive position is affected by its suppliers' abilities to respond to the firm's requirements. Studies have shown that collaboration with suppliers can reduce transaction costs (Dyer, 1997). For example, Dell Computer manages all the transactions over the Internet, leaving the real operational activities in the hands of the suppliers (Swink, Narasimhan, & Kim, 2005). In the literature, supplier performance is considered one of the determining factors for the buyers' operational success (Monczka et al., 1983; Baxter, Fersuson, Macbeth, & Neal, 1989; Ellram, 1991; Davis, 1993; Levy, 1997). Harley-Davidson has reported that supplier involvement has improved its overall quality, reduced costs, and helped Harley-Davidson compete against Japanese manufacturers (Carr & Pearson, 2002). Gulati (1999) noted that the information advantage realized as a result of ties with suppliers could be conceptualized as a network resource, which is similar to the Coleman's 1988 notion of social capital. Network resources are similar to financial and technological resources. As noted above, firm managers determine the types of resources they wish to accumulate over time, and the accumulation of resources is likely to have a path dependent component that eventually ends up at the suppliers' site (Dierickx & Cool, 1989). Therefore, firm managers' discretionary choices relating to how to compete and what resources and capabilities to acquire over time are likely to determine the level of supply chain relationship they wish to pursue with suppliers. Influential adaptation model (Figure 1) suggests that both buyers and suppliers start out at the lower end of competitive priorities such as low cost operation and gradually progress to the higher end of the competitive priorities such as consistent quality, top quality, delivery reliability, volume flexibility, and innovation; however, they adopt each competitive priority at a different rate. Normally, firm managers initiate decisions to adopt a new competitive priority when they realize there is a mismatch between competitive strategy and supply chain ties (e.g., customers, suppliers, distributions, or competitors) that could deteriorate firms' competitive advantage. This notion holds true in the buyer-supplier relationship. The mismatch of competitive priorities between the two parties should warrant the changes in competitive priority to the higher spectrum. Since buyers are in the upper hand of the relationship. The changing is normally initiated by the buyers.

It has been suggested that firms should participate in supply chain networks that are consistent with their product offerings (Krause et al, 1998; Fisher, 1997). Fisher (1997) suggested that innovative production should utilize responsive supply chain networks, whereas functional products require efficient supply chain networks. He noted that a mismatch between supply chain choices and product offerings could negatively affect firm performance. These findings delineate the importance of establishing a certain level of supply chain relationship with suppliers to match firm strategy and capabilities. This study proposes that as buyers are moving toward the higher end of priority such as offering innovative products, it should warrant suppliers to establish certain levels of competitive priorities at least equivalent to the buyers' one; however, the rate of adoption may vary depending on the suppliers' feasibility. Figure 2 shows the main hypothesis and its corresponding hypotheses.

> **H1**: The buyers' adoption of competitive priorities leads to the suppliers' adoption of competitive priorities
>
> **H1a**: The level of suppliers' competitive priorities is at least is equivalent to the level of buyers' competitive priorities
>
> **H1b**: The buyers' competitive priority progresses from a lower level priority to a higher level priority
>
> **H1c**: The suppliers' competitive priority progresses from a lower level priority to a higher level priority

Figure 2: Competitive Priority Adaptation Framework for IT Selection.



IT Use Linked to Competitive Priority

When information technology is properly utilized, buyers and suppliers become more cost effective, more efficient, more agile, more responsive to market changes, and more innovative (Tegarden et al., 2005). Highly frequent information exchanges between buyers and suppliers in production processes increase delivery stability and reliability (Stank et al., 1996). Integrated systems improve information flow between functions of the two parties in the product development process and thus reduce time and effort needed to design new products (Koufteros, Vonderembse, & Jayaram, 2005). The operations management literature reports a number of studies on the operational performance benefits that firms derive from IT use (Frohlich & Westbrook, 2002; Rosenzweig et al., 2003). Successful IT use can provide good quality; accurate, useful and timely information; as well as create systems that operate efficiently by ensuring system availability, reliability, and responsiveness (Buck-Lew, Wardle, & Plishin, 1992). A case study by Carter and Ellram (1994) reported that frequent communication between buyers and suppliers provides both parties the opportunities to access more efficient manufacturing processes, have higher product quality, implement more reliable logistical systems, reduce production cost, and devote more time to product design and innovation. Using proper information technology is an important step toward supply chain integration because it reduces the information errors and the level of mistrust between a firm and its trading partners. The seamless thread of information between functions can help reduce the variation of demand thus reducing the bullwhip effect in the supply chain (Chatfield, Kim, Harrison, & Hayya, 2004). With intensification of competition, the utilization of IT directly influences operational processes comprising the value chain, thus enhance operational performance (Rosenzweig, Roth, & Dean, 2003). Therefore,

> **H2**: The higher the extent of buyers' IT use, the higher the extent of buyers' competitive priorities

> **H3**: The higher the extent of buyers' IT use, the higher the extent of suppliers' competitive priorities

> **H4**: The higher the extent of suppliers' IT use, the higher the extent of buyers' competitive priorities

> **H5**: The higher the extent of suppliers' IT use, the higher the extent of suppliers' competitive priorities

Competitive Priority Linked to Buyer Performance

Competitive priorities play a major role in many studies as intermediate performance indicators (Vonderembse & Tracey, 1999). This capability will in turn influence a firms' overall performance (Mentzer, Min, & Zacharia, 2000). Operational performance provides necessary factors that impact organizational performances by ruling out other types of performance that are not related to supply chain activities. There are many studies supporting these relationships (Carr & Pearson, 1999; Frazier, Spekman, & O'Neal., 1988; Carr & Ittner, 1992; Tan et al., 1998). For example, Carr and Pearson (1999) investigated the impact of strategic purchasing and buyer-supplier relationships on the firm's financial performance. They found that strategically managed long-term relationships with key suppliers improve overall product quality, delivery, and process flexibility; and thus have a positive impact on the firm's financial performance. Therefore,

> **H6**: The greater the extent of buyers' competitive priorities, the greater the extent of buyer performance (BP).

> **H7**: The greater the extent of suppliers' competitive priorities, the greater the extent of buyer performance (BP).

RESEARCH METHODOLOGY

Instrument development for all constructs was carried out in three phases: (1) literature review to identify the domain of the constructs and generate the initial measurement items (Churchill, 1979), (2) review by academic and management experts, and (3) Q-sort (Moore and Benbasat, 1991) using manufacturing managers. The Q-sort results indicate acceptable convergence with the inter-judge raw agreement scores of 91%, overall placement ratio of items 93%, and the Kappa scores of 90%. The final survey items used in this study can be found in Appendix A.

A cross-sectional self-administered mail survey was conducted. A sample was obtained from the Society of Manufacturing Engineers (SME), an internationally known organization of manufacturing managers and engineers. The initial mailing list of 4,000 was randomly selected from the SME members in the East North Central and West North Central regions. 579 surveys did not reach the targeted respondents because of incorrect addresses, 235 responses stated that they would not participate and 14 surveys were returned empty. This left 3,172 in the eligible sample of which 220 surveys were returned providing usable responses. Thus, the response rate for the survey is 6.94% (or 220/3172). A response rate of this size is typical in large-scale surveys that require information from managers (Pflughoeft et al., 2003; Li et al., 2005; Devaraj et al., 2007; Braunscheidel & Suresh, 2009). Respondents were primarily employees holding the title of Manager or Supervisor (80.5%). Of these, 12.3% reported the title of CEO or Director with the balance reporting general management positions consisting of COOs, Chief Manufacturing Engineers, and Vice Presidents, among others. A self-assessment item measured each respondent’s level of computer literacy ranging from 1: know nothing about computers to 10: expert computer user. In an attempt to test for bias between novice and expert computer users, the sample was bifurcated at the mean (μ=7.32) and all of the variables under study were examined using t-tests. None of the variables in the model produced statistically significant results indicating no difference between the novice and expert computer user groups. In terms of industry, 71.81% of respondents represented the rubber and plastic products (SIC 30), fabricated metal products (SIC 34), industrial machinery and equipment (SIC 35), transportation equipment (SIC 37), and other miscellaneous manufacturing industries (SIC 39). Annual sales ranged from $10 to over $100 million for 65% of responding firms, with 24.1% generating > $100 million. Table 1 shows sample characteristics of respondents by job titles, job functions, and level of education.

Non-response bias was tested by comparing results from the first (n = 148) and second (n = 72) mailings. This is a commonly used method for testing non-response bias in Operations Management research (for examples Narasimhan & Kim, 2001; Tu et al., 2004; Li et al., 2005; Swafford et al., 2006). Chi-square tests were performed on sales volume and t-tests were performed on the summated scale of each construct (Armstrong & Overton, 1977). The results in Table 2 indicate no significant difference in the data between the early and late responders, suggesting that the data is representative of the population.

Table 1: Sample Characteristics.

1.	**Job Titles** (220)	
	CEO/President	6.82% (15)
	Director	7.27% (16)
	Manager	53.18% (117)
	Supervisor	27.27% (60)
	Engineer	4.55% (10)
	Other	0.91% (2)
2.	**Job Functions** (261) (respondents may have more than one job functions)	
	Corporate Executive	6.51% (17)
	Purchasing	6.13% (16)
	Transportation	2.30% (6)
	Manufacturing Production	41.38% (108)
	Distribution	1.15% (3)
	Sales	6.13% (16)
	Unidentified	13.41% (35)
	Other	22.99% (60)
3.	**Level of Education** (220)	
	High School	10.45% (23)
	Two-year College	20.00% (44)
	Bachelor's Degree	31.82% (70)
	Master's Degree	16.36% (36)
	Doctor's Degree	1.36% (3)
	Unidentified	15.91% (35)
	Other	4.09% (9)

Table 2: Test of Non-Response Bias.

Variables	First wave Frequency (%)	Second wave Expected Freq. (%)	Second wave Observed Freq. (%)	Chi-square Test
Sales Volume in millions of $ (220)				
<5	20	7	0	χ^2=10.78 df=6 p>.10
5 to <10	10	5	6	
10 to <25	28	13	11	
25 to <50	13	8	12	
50 to <100	20	9	6	
Over 100	33	17	20	
Unidentified	24	13	17	
Variables	**First wave Total score**	**Second wave Total score**	**t - Test**	**p - value**
Buyers' IT Use	72.92	72.52	0.22	0.82
Suppliers' IT Use	86.34	87.47	0.48	0.63
Suppliers' Competitive Priorities	82.58	81.57	0.62	0.53
Buyers' Competitive Priorities	88.87	88.53	0.20	0.84

The calculation formula $\chi^2 = \sum (f_e - f_o)^2 / f_e$

Instrument Reliability and Validity Assessment

Structural Equation Modeling (SEM) was employed to assess the measurement and structural properties of the model (James et al., 1982; Swafford et al., 2006). This analysis was conducted using SPSS and AMOS 18. Content validity was determined through a comprehensive review of the literature, Q-sort, and assessment by a panel of practitioners and academics to ensure that measurement items covered the domain of the construct (Nunnally, 1978; Churchill, 1979). Table 3 displays the original first order instruments, the second order constructs, the standardized item loadings for the measurement models under study (Swafford et al., 2006) as well as the path coefficients between the first and second order models (Braunscheidel & Suresh, 2009). All item loadings are sufficient to demonstrate convergent validity. Items in italic were dropped because of the low factor loading.

Table 3: Measurement model factor loadings.

First order construct	Indicators	First order loadings (λ)	Indicators	First order loadings (λ)
Buyer's Planning IT Use	SII1	.74	SII6	.75
9 indicator items	SII2	.76	SII7	.63
	SII3	.82	SII8	.73
	SII4	.80	SII9	.82
	SII5	.71		
Buyer's Operational IT Use	OII1	.65	OII5	.67
8 indicator items	OII2	.58	*OII6*	*.40*
	OII3	.68	OII7	.63
	OII4	.76	OII8	.65
Buyer's Infrastructural IT Use	DII1	.51	NII1	.83
13 indicator items	DII2	.59	NII2	.75
6 indicator items for data integration	DII3	.62	NII3	.85
7 indicator items for network integration	DII4	.59	NII4	.88
	DII5	*.31*	NII5	.85
	DII6	.58	NII6	.69
			NII7	.76
Supplier's Planning IT Use	SIE1	.81	SIE6	.77
9 indicator items	SIE2	.89	SIE7	.82
	SIE3	.90	SIE8	.89
	SIE4	.85	SIE9	.86
	SIE5	.86		
Supplier's Operational IT Use	OIE1	.79	OIE5	.80
8 indicator items	OIE2	.73	OIE6	.70
	OIE3	.76	OIE7	.78
	OIE4	.83	OIE8	.70
Supplier's Infrastructural IT Use	DIE1	.73	NIE1	.82
12 indicator items	DIE2	.69	NIE2	.82
6 indicator items for data integration	DIE3	.75	NIE3	.73
6 indicator items for network integration	DIE4	.72	NIE4	.84
	DIE5	.61	NIE5	.79
	DIE6	.74	NIE6	.81
Buyer's Cost Leadership	CLF1	.42	CLF4	.83
5 indicator items	CLF2	.78	CLF5	.71
	CLF3	.73		
Buyer's Innovation	INF1	.69	INF4	.55
5 indicator items	INF2	.59	INF5	.55
	INF3	.64		
Buyer's Product Quality	PQF1	.82	PQF4	.78
6 indicator items	PQF2	.78	PQF5	.70
	PQF3	.71	PQF6	.77
Buyer's Process Flexibility	PFF1	.66	PFF4	.53
6 indicator items	PFF2	.62	PFF5	.52
	PFF3	.70	PFF6	.49
Buyer's Delivery Reliability	DRF1	.60	DRF4	.80
6 indicator items	DRF2	.55	DRF5	.79
	DRF3	.74	DRF6	.58

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Supplier's Cost Leadership	CLS1	.61	CLS4	.84
5 indicator items	CLS2	.83	CLS5	.69
	CLS3	.77		
Supplier's Innovation	INS1	.71	INS4	.72
5 indicator items	INS2	.77	INS5	.75
	INS3	.85		
Supplier's Product Quality	PQS1	.76	PQS4	.85
6 indicator items	PQS2	.80	PQS5	.82
	PQS3	.63	PQS6	.77
Supplier's Process Flexibility	PFS1	.57	PFS4	.55
6 indicator items	PFS2	.72	PFS5	.56
	PFS3	.67	PFS6	.70
Supplier's Delivery Reliability	DRS1	.74	DRS4	.81
6 indicator items	DRS2	.61	DRS5	.73
	DRS3	.72	DRS6	.58
Buyer Performance (FP)	BP1	.74	BP3	.77
4 indicator items	BP2	.79	BP4	.85

Second order analysis for buyer's constructs

First order factor	IT Use Second order loadings (λ)	First order factor	Competitive Priorities Second order loadings (λ)
Planning IT Use	.58	Delivery Reliability	.69
Operational IT Use	.86	Process Flexibility	.68
Infrastructural IT Use	.81	Cost Leadership	.75
		Innovation	.86
		Product Quality	.81

Second order analysis for supplier's constructs

First order factor	IT Use Second order loadings (λ)	First order factor	Competitive Priorities Second order loadings (λ)
Planning IT Use	.70	Delivery Reliability	.73
Operational IT Use	.77	Process Flexibility	.75
Infrastructural IT Use	.93	Cost Leadership	.63
		Innovation	.74
		Product Quality	.77

Note: All coefficients are statistically significant.

Cronbach's α, composite reliability, and average variance extracted (AVE) were used to test reliability. Convergent validity can be assessed by examining the individual item loadings on their theorized latent variables (Swafford et al., 2006). The Goodness of Fit Index (GFI) indicates the relative amount of variance and covariance jointly explained by the model. The Adjusted Goodness of Fit Index (AGFI) differs from the GFI in adjusting for the number of degrees of freedom (Byrne, 1989). Both range from 0 to 1. Values of 0.9 or more are considered a good fit (Hair et al., 1998). The RMSEA takes into account the error of approximation and is expressed per degree of freedom, thus making the index sensitive to the number of estimated parameters in the model; values less than 0.05 indicate good fit, values as high as 0.08 represent reasonable errors of approximation in the population (Browne & Cudeck, 1993), values range from 0.08 to 0.10 indicate mediocre fit, and those greater than 0.10 indicate poor fit (MacCallum, Browne, & Sugawara, 1996). A review of Table 4 reveals that almost all constructs display

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AVE values > 0.50 (both process flexibilities are very close to 0.50), thus providing further evidence of convergent validity. Some items were dropped to improve convergent validity (Note: items in italic were dropped. See Appendix A).

Table 4: Convergent Validity and Reliability Analysis (*n* = 220).

Scale	**Cronbach's α** min ≥ 0.70	**Composite Reliability** min ≥ 0.70	**Average Variance Extracted** min ≥ 0.50	**GFI** min ≥ 0.90	**AGFI** min ≥ 0.90	**RMSEA**
Buyer's Competitive Priorities	.93			.86	.83	.07
Delivery Reliability (4)	.88	.89	.66	1.00	.99	.00
Process Flexibility (6)	.83	.82	*.45*	.98	.96	.03
Cost Leadership (5)	.87	.60	.60	.98	.95	.07
Innovation (4)	.79	.80	.50	.98	.90	.13
Product Quality (4)	.86	.86	.61	.98	.94	.08
Buyers' IT Choices	.92			.85	.81	.08
Planning IT Use (5)	.91	.89	.62	.98	.94	.07
Operational IT Use (6)	.87	.88	.54	.97	.94	.07
Infrastructure IT Use (8)	.89	88	.52	.94	.90	.09
Supplier's Competitive Priorities	.93			.86	.83	.07
Delivery Reliability (5)	.88	.89	.61	.98	.93	.09
Process Flexibility (5)	.81	.82	*.48*	.99	.97	.00
Cost Leadership (5)	.88	.89	.62	.97	.91	.10
Innovation (4)	.88	.88	.65	.98	.92	.11
Product Quality (4)	.85	.86	.61	1.00	.98	.02
Supplier' IT Use	.94			.83	.79	.09
Planning IT Use (6)	.95	.93	.72	.98	.90	.10
Operational IT Use (6)	.91	.91	.64	.98	.95	.05
Infrastructure IT Use (6)	.90	.90	.60	.97	.92	.08
Buyer Performance (4)	.80	.87	.63	.99	.96	.05

Evidence of discriminant validity exists if the AVE of each construct is greater than the square of the correlations (Braunscheidel & Suresh, 2009). An acceptable alternative suggests that the square root of a construct's AVE should be greater than the correlations between constructs (Chin, 1998; Fornell & Larcker, 1981; Koufteros, 1999; Koufteros et al., 2001). Table 5 displays the correlations between all latent constructs. The square root of the AVE for each construct is bolded and can be found on the diagonal. Each is greater than the value of the correlations in its corresponding row and column.

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Table 5: Discriminant validity (square root of AVE on diagonal in bold).

Buyer's Constructs	DR	PF	CL	IN	PQ	PI	OI	II	BP
Delivery Reliability	**.82**								
Process Flexibility	.41	**.67**							
Cost Leadership	.50	.51	**.78**						
Innovation	.16	.56	.67	**.71**					
Product Quality	.48	.57	.53	.70	**.79**				
Planning IT Use	.16	.18	.37	.29	.26	**.79**			
Operational IT Use	.51	.37	.30	.34	.32	.51	**.73**		
Infrastructural IT Use	.46	.39	.23	.31	.39	.46	.68	**.72**	
Buyer Performance	.23	.32	.45	.47	.50	.22	.23	.20	**.79**

Supplier's Constructs	DR	PF	CL	IN	PQ	PI	OI	II	BP
Delivery Reliability	**.78**								
Process Flexibility	.62	**.70**							
Cost Leadership	.40	.50	**.79**						
Innovation	.42	.55	.50	**.81**					
Product Quality	.61	.49	.47	.60	**.78**				
Planning IT Use	.06	.11	.05	.27	.12	**.85**			
Operational IT Use	.29	.22	.06	.17	.24	.52	**.80**		
Infrastructural IT Use	.16	.25	.02	.26	.20	.60	.66	**.78**	
Buyer Performance	.28	.20	.27	.34	.27	.20	.22	.15	**.71**

Finally, it is important to control for common method bias (CMB) prior to evaluating the structural model. CMB can prove problematic in studies that employ survey method from single respondents for data collection by inflating or deflating the relationships among variables (causing both Type I and Type II errors) (Podsakoff et al., 2003). Thus, certain preventive measures were undertaken during the data collection consistent with Rosenzweig (2009). The data were also statistically tested for the presence of CMB following data collection. Harman's (1967) single-factor test is often used to assess CMB (Rosenzweig, 2009). In this study, the data do not appear to fit the single-factor model, nor does one factor account for a substantial amount of variance. Next, the single-method-factor test advocated by Podsakoff et al. (2003) was employed. After controlling for the effects of the latent method factor, all of the path loadings of the hypothesized items remained statistically significant on their target constructs and the average item variance explained by the substantive constructs was substantially greater than those linked to the latent method factor. Further, only a few of the latent method factor coefficients were statistically significant. Thus, the presence of CMB is unlikely (Podsakoff et al., 2003; Rosenzweig, 2009).

Structural model results

After the measurement models are specified, the hypothesis testing was done using structural equation modeling (AMOS 18). Table 6 indicates that H1 is supported at the $p<0.001$ level ($\beta=.64$, $t=5.32$), which suggests that the buyers' competitive priorities influence the suppliers' adoption of competitive priorities. H1a is supported, which lends support that suppliers will adopt certain competitive priorities at least equivalent to those adopted by the buying firms. Evidences from Table 6 also provide detailed insights. For example, when buying firms adopt lower competitive priorities such as *cost leadership*, *product quality*, and *delivery reliability*, suppliers only pursue the same priority as the buyers and perform poorly on the higher priorities. However, the suppliers perform much better when the buyers adopt higher priorities such as *process flexibility* and *innovation* as it shows especially that *innovation* strongly influences the suppliers to improve on all competitive priorities.

Table 6: Structural model results for Hypotheses 1 and 1a.

Buyers	Suppliers	†	t-value	Buyers	Suppliers	†	t-value
Delivery Reliability	Delivery Reliability	.30	4.60***	Innovation	Delivery Reliability	.58	6.52***
	Process Flexibility	-.06	-0.99		Process Flexibility	.65	6.63***
	Cost Leadership	-.12	-2.08**		Cost Leadership	.69	6.64***
	Innovation	-.02	0.68		Innovation	.82	7.52***
	Product Quality	.06	0.32		Product Quality	.71	6.86***
Process Flexibility	Delivery Reliability	.27	4.10***	Product Quality	Delivery Reliability	-.03	-0.51
	Process Flexibility	.40	5.72***		Process Flexibility	-.36	-5.49***
	Cost Leadership	-.13	-2.02**		Cost Leadership	-.20	-3.22***
	Innovation	.06	1.07		Innovation	-.09	-1.59
	Product Quality	-.02	-0.31		Product Quality	.20	3.17***
Cost Leadership	Delivery Reliability	-.25	-3.54***	Buyer’s Competitive Priorities	Supplier’s Competitive Priorities	.64	5.32***
	Process Flexibility	-.12	-2.05**				
	Cost Leadership	.22	3.32***				
	Innovation	-.18	-2.84***				
	Product Quality	-.21	-3.11***				

*** = p < .001; ** = p < .05; † Coefficient

From Table 7, H1b is supported at the p<0.001 level, which indicates that the buying firms’ competitive priorities progress sequentially from a lower priority to a higher one. The progressive sequence is portrayed as *cost leadership* → *product quality* → *delivery reliability* → *process flexibility* → *innovation*. H1c is also supported at the p<0.001 level, which indicates that the suppliers’ competitive priorities evolve progressively from a lower priority to a higher one with the same sequence as the buyer.

Table 7: Structural model results for hypotheses 1b and 1c.

Buyer	**Coefficient**	**t-value**
Cost Leadership –> Product Quality	.59	5.65
Product Quality –> Delivery Reliability	.56	5.71
Delivery Reliability –> Process Flexibility	.48	5.67
Process Flexibility –> Innovation	.58	6.46
Supplier		
Cost Leadership –> Product Quality	.48	5.66
Product Quality –> Delivery Reliability	.63	7.63
Delivery Reliability –> Process Flexibility	.65	6.96
Process Flexibility –> Innovation	.57	6.14

Note: All coefficients are statistically significant at p < .001.

From Table 8, H2 is supported at the p<0.05 level (β=.55, t=2.50), which suggests that the utilization of IT may help buyers to better at setting competitive priority goals and achieving them. Unfortunately, the equivalent reference cannot be drawn for the suppliers. H3, H4, and H5 are not significantly supported, which indicates suppliers' competitive priorities may not be affected by the level of IT use from both sides. Suppliers' IT use is also found to have no impact on the how buyers perform on competitive priorities. H6 is supported at the p<0.001 level (β=.76, t=5.67), which suggests that buyers' competitive priorities lead to higher buyer performance. Unfortunately, the suppliers' competitive priorities do not lead to buyer performance and thus, H7 is not statistically support.

Table 8: Structural model results for hypotheses 2, 3, 4, 5, 6 and 7.

Hypotheses	Exogenous	Endogenous	Coefficients	t-value	p
H2	Buyers' IT Use	Buyers' Competitive Priorities	0.55	2.50	**
H3	Buyers' IT Use	Suppliers' Competitive Priorities	-0.19	-0.89	0.38
H4	Suppliers' IT Use	Buyers' Competitive Priorities	-0.05	-0.23	0.82
H5	Suppliers' IT Use	Suppliers' Competitive Priorities	0.21	1.08	0.28
H6	Buyers' Competitive Priorities	Buyer Performance	0.76	5.67	***
H7	Suppliers' Competitive Priorities	Buyer Performance	-0.11	-1.10	0.27

*** = p < .001; ** = p < .05

DISCUSSION AND IMPLICATIONS

This research proposes and empirically tests a conceptual model if and how IT use impacts operational performance (i.e., competitive priorities) of both a buying firm and its suppliers and how they affect the buying firm's bottom line. Consequently, this model laid the groundwork for the development of a survey to empirically examine such relationships in the manufacturing industry. Data from the Society of Manufacturing Engineers were gathered and analyzed. The results of the study can be summarized in the following managerial suggestions and guidelines.

Managerial and Academic Implications

Five competitive priorities were employed including *cost leadership*, *product quality*, *delivery reliability*, *process flexibility* and *innovation*. In addition, three IT selection sub-constructs were developed including *planning IT use, operational IT use,* and *infrastructural IT use*. Overall, the evidence suggests that the instrument can provide reliable data and that the constructs measured are valid. The instruments were tested using rigorous reliability and validity procedures to achieve the highest level of refinement that can be applied more generally to survey research in operations strategy or other supply chain management areas. Operational measures of key decision variables such as competitive priorities and IT selection are useful to both decision makers and researchers. Measures of competitive priorities and IT selection can be used to guide decisions made on process choice, technology, and inventory strategy for both firms and suppliers. Thus having a reliable and valid instrument is crucial. Operational measures of competitive priorities and IT selection also have direct managerial utility in auditing the manufacturing strategy of the firm and in deciding appropriate benchmarking strategy with suppliers. For researchers, the instrument for IT selection can be used to expand operations strategy research. It is important for researchers to build on each other's work, using scales that have proved to be reliable and valid, and searching for new measures for variables not well measured to date. It is one way to move forward in the research stream.

The results show that three of the seven main hypotheses were significantly supported. Underpinned by the competitive priorities literature, this paper provides a research framework to understand the dynamism of competitive priorities in both firms and suppliers. Previous literature suggests two models explaining the changing dynamic of competitive priorities. The Trade-Offs model suggests firms pursue one priority over another (Wheelwright, 1984; Skinner, 1985; Skinner, 1996). The Sand Cone model suggests firms' selection of competitive priorities is mutually reinforcing or cumulative (Swink et al., 2005; Nakane, 1986; Hall, 1987; Ferdows & De Meyer, 1990). This study introduces the Influential Adaptation model by arguing that, in the supply chain relationship environment, buying firms form a cooperative bond with suppliers. They both consider each other as a distinctive source of capability (Gulati, 1995; Powell et al., 1996; Gulati, 1999). The Influential Adaptation model suggests that buying firms are likely to initiate the adoption of a new and better competitive priority, and suppliers are likely to follow suit under the impression that the mismatch may deteriorate competitive advantages. For influential priority adaptation, the results provide full support for all hypotheses. It shows both firms' and suppliers' competitive priority progresses from lower end (e.g., cost leadership) to the higher end (e.g., innovation). The results also confirm that suppliers adopt at least an equivalent level of competitive priority to the firm level and the firm's adoption of higher level competitive priorities (e.g., process flexibility and innovation) may influence suppliers to do more to improve themselves.

IT use within a buying organization is found to be directly and positively related to its firm operational capabilities. It provides the ability to link and collaborate externally with suppliers. These findings are consistent with the current research stating that the process of integration should progress from internal integration to external integration (Bowersox, 1989; Stevens, 1989; Byrne & Markham, 1991; Hewitt, 1994). Since, internal IT capabilities increase both internal and external collaboration as well as firm performance (Sanders & Premus, 2005), managers seeking to gain benefits from supply chain integration must first ensure that IT use within their organizations is integrated at the operational and strategic levels to maximize their benefits. Thus, managers should carefully consider adopting enterprise-wide information systems that can be expanded to be compatible with external partners. Although such implementations are often time consuming and capital intensive and not all firms will be successful, our results suggest those that are successful can attain operational advantages such as improving delivery speed, product quality, product development time and cost, enhancing process flexibility and reliability.

The findings do not lend any support regarding suppliers' competitive priorities. Suppliers' operational performance is not improved by any type of technology implemented internally or by the buyers. This suggests that although integration of buyers' information systems with suppliers can lead to improved buyer performance, suppliers do not gain benefits from technology implementation. Commonly, suppliers implement technologies just to pass status quo or make the buyers happy. They do not actually use the technologies to improve themselves. Therefore, it is a tall order for managers to follow through to make sure that suppliers actually utilize the technologies. However, one caveat is that forcing technology implementation is likely to be more difficult with small suppliers who may not have sufficient resources and information technology capabilities (Larson, Carr, & Dhariwal, 2005). The results show the relationship between buyers' competitive priorities and buyer performance. However, the suppliers' competitive priorities do not directly affect the buyer performance. The results confirm the suspension mentioned previously regarding suppliers' performance. With the low acceptance in technology implementation from suppliers, it is likely that suppliers do not have the same sentiment regard technology adoption as the buyers do. They do not value new technologies and thus, do not fully utilize them. It is not surprised to find that suppliers' performance does not lead to buyer performance because the two firms are in the buyer-supplier relationship and sometimes they have conflict of interest. Suppliers normally serve many buyers and sometimes they must share their interest among many firms. Therefore, managers must set forth fierce selective criteria and systematic supplier appraisal procedures that ensure suppliers' accountabilities on IT utilization.

Limitations and Future research

While this research makes significant contributions from both a theoretical and practical point of view, the findings are subject to two limitations. First, individual respondents (manufacturing managers and top managers) were asked to respond to many issues regarding competitive priorities and IT use for both firms and supplier. Although these biases may be minimized by sample size in this study, future research should seek to utilize multiple respondents from each participating organization as an effort to enhance reliability of research findings. Second, the response rate of approximately 7%, while comparable to similar studies (see Tu et al., 2001; Tu et al., 2004; Li et al., 2005; Tan & Tracey, 2007), is less than hoped for. A possible cause of the low response rate is the lengthy questionnaire. Because of time constraints executives are less likely to participate in a lengthy survey. This issue can be addressed by reducing the number of items in the questionnaire and focusing on areas requiring further clarification.

Overall, these limitations do not substantially detract from the significance of findings. The concept of competitive priorities has been widely adopted by both conceptual and empirical researchers in many areas such as manufacturing strategy, supply chain management and etc. and by practitioners. Since competitive priorities continue to be important variables in operations strategy research, the findings of this paper are offered as a small important extension to the research stream.

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APPENDIX A

Measurement of research constructs (*Items in italic were dropped to improve divergent validity in the final model.*)

Competitive Priorities: The following situations describe the extent to which the **buying firm (or supplier) assesses the level of competitive priorities**. Please circle the appropriate number to indicate the level of your attainment of each objective.

Coding	Items	Coding	Items
Delivery reliability (DR-S)		**Delivery reliability (DR-F)**	
DR-S1	Deliver materials/components/products as promises.	**DR-F1**	Deliver materials/components/products as promises.
DR-S2	Provide materials/components/products that are highly reliable.	***DR-F2***	*Provide materials/components/products that are highly reliable.*
DR-S3	Provide fast delivery.	**DR-F3**	Provide fast delivery.
DR-S4	Provide on-time delivery.	**DR-F4**	Provide on-time delivery.
DR-S5	Provide reliable delivery.	**DR-F5**	Provide reliable delivery.
DR-S6	*Decrease manufacturing lead time.*	***DR-F6***	*Decrease manufacturing lead time.*
Process flexibility (PF-S)		**Process flexibility (PF-F)**	
PF-S1	Make rapid design changes.	**PF-F1**	Make rapid design changes.
PF-S2	Make rapid production volume changes.	**PF-F2**	Make rapid production volume changes.
PF-S3	Make rapid changeover between product lines.	**PF-F3**	Make rapid changeover between product lines.
PF-S4	Process both large and small orders.	**PF-F4**	Process both large and small orders.
PF-S5	*Produce a variety of different products.*	**PF-F5**	Produce a variety of different products.
PF-S6	Increase capacity utilization.	**PF-F6**	Increase capacity utilization.
Cost leadership (CL-S)		**Cost leadership (CL-F)**	
CL-S1	Produce materials/components/products at low cost.	**CL-F1**	Produce materials/components/products at low cost.
CL-S2	Reduce production cost.	**CL-F2**	Reduce production cost.
CL-S3	Reduce inventory cost.	CL-F**3**	Reduce inventory cost.
CL-S4	Reduce unit cost.	**CL-F4**	Reduce unit cost.
CL-S5	Increase labor productivity.	**CL-F5**	Increase labor productivity.
Innovation (IN-S)		**Innovation (IN-F)**	
IN-S1	Develop new ways of customer service.	**IN-F1**	Develop new ways of customer service.
IN-S2	Develop new forms of shop floor management.	**IN-F2**	Develop new forms of shop floor management.
IN-S3	Develop new ways of supply chain management.	**IN-F3**	Develop new ways of supply chain management.
IN-S4	*Develop new products and features*	***IN-F4***	*Develop new products and features*
IN-S5	Develop new process technologies.	**IN-F5**	Develop new process technologies.
Product quality (PQ-S)		**Product quality (PQ-F)**	
PQ-S1	Provide better product performance.	**PQ-F1**	Provide better product performance.
PQ-S2	*Improve product durability*	***PQ-F2***	*Improve product durability*
PQ-S3	Provide product conformance to specifications.	**PQ-F3**	Provide product conformance to specifications.
PQ-S4	*Improve product reliability*	**PQ-F4**	Improve product reliability
PQ-S5	Reduce defective rate.	**PQ-F5**	Reduce defective rate.
PQ-S6	Better product reputation.	***PQ-F6***	*Better product reputation.*

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IT Selection: The following situations describe the extent to which the **buying firm (or supplier) uses information technology (IT) for strategic (planning), operational, and infrastructural purposes**. Please circle the appropriate number to indicate the extent to which you agree or disagree with each statement as applicable to your unit.

Coding	Items	Coding	Items
Firm's Planning IT Use			**Supplier's Planning IT Use**
SII1	Formulate long-term collaborative decision making.	**SIE1**	Formulate long-term collaborative decision making.
SII2	*Justify long-term business plans.*	**SIE2**	Justify long-term business plans.
SII3	Analyze long-term business plans.	**SIE3**	Analyze long-term business plans.
SII4	Develop long-term business opportunities.	**SIE4**	Develop long-term business opportunities.
SII5	*Identify new markets.*	***SIE5***	*Identify new markets.*
SII6	Identify long-term technology justification and planning.	**SIE6**	Identify long-term technology justification and planning.
SII7	*Study strategies of competitors.*	***SIE7***	*Study strategies of competitors.*
SII8	Define long-term competitive positioning.	***SIE8***	*Define long-term competitive positioning.*
SII9	*Set long-term strategic goals.*	**SIE9**	Set long-term strategic goals.
Firm's Operational IT Use			**Supplier's Operational IT Use**
OII1	Adjust daily manufacturing processes.	**OIE1**	Adjust daily manufacturing processes.
OII2	*Adjust daily product development processes.*	**OIE2**	Adjust daily product development processes.
OII3	Control daily product quality.	**OIE3**	Control daily product quality.
OII4	Manage daily order quality.	**OIE4**	Manage daily order quality.
OII5	Exchange daily inventory information.	**OIE5**	Exchange daily inventory information.
OII6	*Select suppliers.*	***OIE6***	*Select raw materials and parts.*
OII7	Manage daily logistical activities.	***OIE7***	*Manage daily logistical activities.*
OII8	Establish daily product forecasts.	**OIE8**	Establish daily product forecasts.
Firm's Infrastructural IT Use			**Supplier's Infrastructural IT Use**
Data Integration			***Data Integration***
DII1	Use standard data definitions and codes.	**DIE1**	Use standard data definitions and codes.
DII2	*Use standard information/data format.*	***DIE2***	*Use standard information/data format.*
DII3	Use standard presentation format.	***DIE3***	*Use standard presentation format.*
DII4	*Use centralized databases.*	**DIE4**	Use centralized databases.
DII5	*Use database synchronization system.*	***DIE5***	*Use database synchronization system.*
DII6	Integrate data and information.	***DIE6***	*Use compatible database systems.*
Network Integration			***Network Integration***
NII1	Use IS networks to communicate with other departments.	**NIE1**	Use IS networks to communicate with each other.
NII2	Use IS networks to connect to each other's database.	**NIE2**	Use IS networks to connect to each other's database.
NII3	Use IS network applications.	***NIE3***	*Use IS network applications.*
NII4	Use IS networks to share information with other departments.	**NIE4**	Use IS networks to share information with each other.
NII5	*Use IS networks to connect to centralized databases.*	**NIE5**	Use IS networks to facilitate periodic meetings.
NII6	*Use IS networks to facilitate periodic interdepartmental meetings.*	***NIE6***	*Use compatible network architectures.*
NII7	Use compatible network architectures.		

Buyer Performance (BP): The following statements measure overall performance of your firm. Please circle the appropriate number that best indicates the level of your firm's overall performance.

FP1	Customer retention rate.
FP2	Sales growth.
FP3	Return on investment.
FP4	Overall competitive position.
FP5	*Production throughput times.*

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