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Does Information Technology Provide Competitive Advantage And Improve Performance? An Empirical Study Of Trading Companies In Brazil

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ABSTRACT: Growing investment in information technology applications creates a need to understand the proper integration of these tools into strategic decision making of the firm. This study discusses the impact of global information and communication technologies on competitiveness and performance of Brazilian trading companies. Using resource based theory as a starting point, we examine how information technology, as an internal resource, can provide competitive advantage and what impact information technology produces on competitiveness of Brazilian export intermediaries. The study implements a replicable model (CAPITA) developed by Sethi and King (1994), to investigate these relationships in the emerging market of Brazil. The empirical findings reveal that superior export performance depends on the ability of managers to interpret and utilize some CAPITA dimensions that have a strong relationship with the trading company's performance. The results corroborate previous research confirming that information technology application has a strong impact on performance. This research extends previous work on this topic within the North American hemisphere, to the South American hemisphere. The development of a strong network of export intermediaries in the emerging market of Brazil can be enhanced by a better understanding of the impact of technology applications, and corresponding government policies endorsing growth.

Keywords: information technology, competitive advantage, trading companies

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1. INTRODUCTION

Although companies around the world have invested billions of dollars in information technology, it is still difficult to make a connection between the company's technology investments to its business performance. For most executives there is the pending question whether information technology pays off. In their quest for answers to those questions, CEO's of large and small companies do realize that information technology is not only a survival issue, information technology is a concurrent part of business strategy itself.

This paper builds on the work of the resource-based-view –RBV to explain how resources like information technology can be used as a source of competitiveness. This research indicates that information technology per se is not a source of competitive advantage, but the ways in which managers leverage those resources are the key issues in implementing a successful strategy on a global basis.

2. THEORETICAL BACKGROUND

The Resource Base View Theory

One of the main threads of strategic management research is to understand how firms create competitive advantage. According to Porter (1980) firms create competitive advantage when they perceive or discover new and better ways to compete in an industry and bring them to market. Porter's study, based on industry organization economics, gives an important contribution to our understanding of competitiveness. It is extended in the strategic management literature in the direction of a deeper analysis of the resources and capabilities of the firm, to understand why firms in the same industry perform better than others. Dissatisfaction with the limits of industry organization economics led many researchers to rediscover Penrose (1959), who in a seminal work, argues that firms are distinguished by the relation to the use of productive resources, physical and human, for the purpose of selling goods and services. According to Penrose it is never the resources themselves that make the difference, but the services the resources can render.

Building on Penrose's work, a stream of research on the resource-based view, aims to clarify and explain how combinations of resources and competencies contribute to firm performance (Rumelt, 1984; Teece, 1984; Wenerfelt, 1984). Dunning (1993) discusses competitive advantage considering firm resources as the basic unit of analysis. He states that competitiveness depends on the ability of firms to create new products or supply existing products at lower real cost by increasing the productivity of created resources.

Ghoshal & Bartlett (1999) link competitive advantage to the ability of the company to be innovative, regardless of market pressures. They argue that managers should focus on the process that would release entrepreneurial spirit inside the organization, in this way integrating the resources and capabilities across the units to create new combinations of resources and knowledge.

Mata, Fuerst, & Barney (1995) stress that if a firm possesses a resource or capability that is possessed by numerous other competing firms, that resource or capability cannot be a source of competitive advantage. Common resources do not meet the resource heterogeneity requirement, and thus are, at best, sources of competitive parity. Conversely, if a firm possesses a resource or capability that is not currently owned by competing firms, the condition of resource heterogeneity is met and a firm may obtain, at least, a temporary

competitive advantage. The second resource-based condition, the condition of resource immobility, becomes important in understanding when a firm's resources and capabilities will be sources of sustained competitive advantage.

According to Barney (1995), a firm may use its information technology resources to help implement a wide range of strategies, including cost leadership, product differentiation, strategic alliance strategies, diversification strategies, and vertical integration strategies.

The resource-based view places at center stage the hard-to-copy resources as the drivers of firm strategy and performance. Pitt & Clarke (1999) advocate the use of RBV theory to understand hard-to-copy assets, skills and knowledge, referred to as core competencies as they confer competitive advantage to firms that possess those capabilities.

Several empirical studies examine the effectiveness of the resource-based-view theory. Chatterjee & Wernerfelt (1991) show that there is a strong association between resources, mainly intangible assets, like brand name innovative capacity, and related diversification of firms. Piercy et al. (1998) suggest that success in exporting depends on the fit between a specific market opportunity and the company's resources, which are the foundation for sustainable competitive advantage.

The research of McGrath, MacMillan, & Venkatamaran (1995) supports resource-based theory, stating that competitive advantage is to some extent related to processes at work inside the organization. The results suggest that managers should try to understand the process by which comprehension is developed so that the firm may develop deftness and hence competencies, which are necessary precursors to competitive advantage.

Markides & Williamson (1996) developed studies arguing that related diversification will increase performance only if it allows a business to have access to strategic assets, those which are rare, valuable, imperfectly tradable, and difficult to imitate. These considerations imply that firms need to develop internal mechanisms in an efficient way to allow the transference of competencies and assets across business units.

Bartlett & Ghoshal (1993) advocate that the resource that constrains the growth and strategic success of many companies is not so much capital as it is knowledge and capabilities that are embedded within the company. The resource-based-view assumes that the characteristics of organizational knowledge are heterogeneous. For that reason, the organization's global management staffing strategy can contribute to a sustained competitive advantage and facilitate a process of creating organizational learning capability, which is hard to replicate. Harvey, Speier, and Novicevic, 1999, and Spender (1996) posit that both tangible and intangible dimensions of global staffing strategy can contribute to the development of global knowledge. The tangible dimensions are related to processes and procedures like personnel training, motivation and policies to retain the right people in the organization. Intangible dimensions of global staffing include corporate culture, the ability to generate and share knowledge, learning capability, proactive innovation, and cognitive flexibility of the employees. Therefore, a firm's competitiveness depends on timely response, flexible strategies and management capability to coordinate tangible and intangible resources to achieve the organization's goals.

Bringing the resource-based-view (RBV) into the context of the industrial organization view gives us a starting point for examining strategy. As per the resource-based view, environmental opportunities are not at the beginning of the strategic process. Jolly (2000) recommends that the firm should act upon, shape and transform the environment. Hence the firm should choose a strategy that allows the best exploitation of resources and competencies taking into account the external opportunities. Teece's (1997) empirical research provides support to the concept that the way production is organized inside a company is the source of

difference in firms. His research indicates that performance is very much related to routines, which include gathering and processing information, for linking customer experiences with firm's procedures, and for coordinating factories, suppliers and final users. Hence, competitive advantage is a function of the way assets are mustered and organized in a changing market.

Applying the resource-based view to attributes of information technology, it is possible to examine the ability of information technology, as a resource, to generate sustained competitive advantage. This involves investigating management's ability to conceive, develop, share systems, information, disseminate innovations, transfer knowledge to other locations, foster organizational learning from contacts among offices, and exploit IT applications to support other business functions.

According to Mata et al. (1995) the search for information technology-based sources of sustained competitive advantage must focus less on information technology, per se, and more on the process of managing information technology within a firm. As a consequence, managers of information technology should be able to work with each other, with managers in other functional areas, to evaluate various customers, as well as use systems as a substitute for labor.

The Growth of Electronic Commerce

The driving forces behind information and communication technology are so powerful that they are already changing many facets of business. Looking at examples such as electronic banking, on-line distance education, electronic stock trading, on-line car auctions, and internet shopping malls, academics and practitioners are faced with making sense of the impacts of IT on how firms develop strategically. A key question relates to the benefit of investment versus the cost of investment, and competitive pressures to invest regardless.

Hutchinson (1998) points out the lack of companies showing profits from Internet based activities. But even the most conservative private estimates predict ten-fold volume growth in electronic commerce for the next few years. Dryden (1998) forecasts, based on current reported growth rates, a trillion $US electronic marketplace in the not too distant future.

Grover & Ramanlal (1999) posit that buyers and suppliers can use electronic commerce to leverage information technology networks to their advantage. They argue that technologies provide consumers with several options, services, and provide suppliers with the means to use strategies to generate monopolistic rents. Gecowets & Bauer (2000) suggest that the growth of electronic commerce will encompass solutions that help reduce inventories, lower cost of production, and facilitate just-in-time manufacturing linking vendors and suppliers, as well as solutions that allow organizations to explore new market opportunities.

Technological advances, via the Internet, have opened up the world like never before, with multiple B2B Web sites that manage the entire sourcing process (Sowinski, 2000b). The large impact of the Internet on business is obvious particularly in business-to-business chains, as companies analyze their relationships with their partners. Managers stress different impacts on strategy, such as functionality of the Internet, improvement of customer service, and integration of branches. Dell & Fredman,1999, argue that fundamental changes have occurred, such as cost reduction through elimination of bureaucracy and speedier one on one transactions. They further contend that competitors were forced to locate to the web to compete with Dell Computers.

Although companies around the world have invested billions of dollars in information technology, it is still difficult to make a connection between technology investments and

business performance. For most executives there is always the pending question whether information technology really pays off. Today, more and more Chief Executive Officers of small and large corporations ask themselves about e-commerce opportunities for their businesses and how they can organize them. In their quest for answers to these questions they believe that information technology is not only a survival issue, it is the key business strategy.

Information Technology in a Global Environment

International business and strategic management research come together when focused on the role of information technology in the global environment and the impact on firm performance. This research focuses on the question of information technology providing competitive advantage for export intermediaries in Brazil. Export intermediaries are key players in the economic development of emerging markets, as markets open up and governments seek to balance import accounts against export accounts. To succeed information technology must be aligned with global information management strategy, information technology managers must be involved in developing planning processes for linking information strategies to business needs.

Ives & Jarvenpaa (1991) advocate that information technology, on a global scale, has the ability to compress time and space allowing the duplication and sharing of organization resources. It permits companies to leverage advantages in market size and shorten distances thus allowing faster response to market demands. Weill & Broadbent(1998), stress that aligning the management of local operations with firm strategic directions on multiple sites and integrating information resources, involving multiple cultures and different technological environments is a hard undertaking. Clarke (1989) pointed out, based on a study of the implementation of information technology in retail banking in Canada and the U.S.A. that, to a certain extent, technology drives strategy. She concluded that as a result from bank automation, both U.S. and Canadian branch managers believed that automation would help them to make better decisions. On the other hand, because technology had a decided effect on the cost structure of banking, increasing fixed costs, retail banks were forced to sell new products, at the same time as they had to continue to control costs. The implementation of information technology thus affected the branch manger's job, demanding that they had more skills.

Prahalad & Oosterveld (1999) stress that global logistics and flexible manufacturing systems are becoming new sources of competitive advantage. Baker (1999) argues that global information technology has a strong impact on the strategy of organizations worldwide. Ghoshal & Westney (1991) advocate that better access to external information is included in the perception of what information technology can do to improve the analysis of competitors.

Karimi & Konsynski (1991) argue that in the face of increasing industry globalization and national competitive policies, global strategies are needed. On the one hand, if countries have to compete more effectively and must improve coordination and control of trade documentation, vital items to the economic health of the nation, then global firms must coordinate similar or linked activities performed in different countries. Coordination implies the management of information exchange, goods, expertise, technology and other important resources, and cost reduction through advances in information and communication technology.

Karimi, Gupta, & Toni (1996) investigate the impact of the elimination of trade barriers in Europe and the free trade agreement between the United States and Canada in the financial services industries. The research model considers that the trade agreements are

going to have a strong impact on the strategies of firms since they add complexity and uncertainties to the business environment and a shift in public expectations of business. The study finds that information technology organization, information technology integration, and competitive strategy, are important predictors to a firm's response to trade agreements. For information technology managers, the results show that competitive strategy affects investments in information technology.

Investigating the linkages between information technology and firm performance, Powell & Dent-Miccallef (1997) show that information technology alone does not produce sustainable competitive advantage in the retail industry. Some firms have gained competitive advantages by using information technology to leverage intangible, human and business resources.

Weill & Broadbent (1998) support the benefit of the combination of human infrastructure with technology components to create reliable services. The infrastructure created through this combination provides a source of competitive advantage. This supports the resource-based view, and helps to explain why some firms succeed while others fail to sustain information technology sustained competitive advantage.

3. METHODOLOGY

The study uses a tool developed by Sethi and King (1994) comprising of a set of measures for the construct Competitive Advantage Provided by an Information Technology Application (CAPITA), to assess the strategic impact of information technology. This instrument is used in this research to investigate how companies seek to use information technology for competitive advantage and how well they succeed.

CAPITA is defined as referring to benefits accruing to a firm, in terms of competitive advantage that are caused by a single information technology application. Information technology application is defined as the support of business activities through the use of hardware, software that collects, transmits processes and disseminates information. The CAPITA instrument measures the relationship between an information technology application and the competitive advantage derived by its use.

The questionnaire is used here to gather information about the impact of information technology on trading companies in Brazil. Since the data is collected from Brazilian trading companies, the questionnaire is translated into the Portuguese language. The back-translation technique is used to accomplish item equivalence in different languages. Therefore, back translation of the questionnaire from Portuguese language into English is carried out to ensure that the Portuguese version of the questionnaire does not differ from the original. The Portuguese version of the questionnaire is content analyzed by English professors in Brazil to ensure suitability of the items in the business settings.

Key Dimensions of CAPITA

CAPITA quantifies the effect of a single information technology application on the competitive advantage of a corporation. A confirmatory analysis shows that CAPITA might be grouped into seven dimensions, which can be used as a multidimensional measure of competitive advantage that satisfies the uni-dimensionality and convergent validity criteria. CAPITA dimensions are presented as follows:

Primary Activity Efficiency: Refers to the effect of information technology application on the cost of inbound logistics (receiving, storing, and disseminating inputs to the product), operations (transforming inputs into the final product), outbound logistics (collecting, storing,

and distributing the final product to customers), and service (enhancing or maintaining product value).

Support Activity Efficiency: Comprises the impact of the information technology application on the cost of human resource management (recruiting, hiring, development, and compensation of personnel), firm structure (general management, planning, finance, accounting, legal, government affairs, and quality management), and coordination of different activities.

Resource Management Functionality: Measures how well information technology application assists its primary users in meeting needs related to a resource: monitor utilization, upgrade, transfer or dispose, and account for. Those activities refer to the post-acquisition management of the resource for competitive advantage.

Resource Acquisition Functionality: Consists of the information technology application's impact on the acquisition phase of the resource life cycle. This dimension measures the impact of information technology application on the ability of users to order a resource, acquire it and verify its acceptability.

Threat: Refers to the impact of the information technology application on the following items. (1) The firm's ability to evaluate and select suppliers (2) its switching costs (3) its ability to threaten vertical integration (4) its ability to evaluate and select customers (5) customers' cost of locating alternate suppliers (6) customers' switching costs.

Pre-emptiveness: Comprises the extent to which the information technology application provides unique access to brokers, distributors and retailers; forces competitors to adopt less favorable market postures, influences the development of industry practices and standards, and offers barriers against imitation such as patents, copyrights, and trade secrets.

Synergy: Refers to the application's alignment with the firm's business strategy, marketing policies and practices, ability to innovate on a regular basis and enhance the application, technical expertise, and top management support for the application. The integration of information technology application with business goals make it difficult for competitors to replicate the application, which is supported by the resource-based view of the firm (Barney, 1995). Synergy means the exploitation of the firm's uniqueness by the information technology application, making copying itself difficult.

Table 1 shows the measures grouped into seven dimensions.

Table 1: CAPITA Measures that Satisfy the Uni-dimensionality and Convergent Validity Criteria

Factor 1: PRIMARY ACTIVITY EFFICIENCY (PAE)	
	Impact of the application of the following:
E2	Cost of receiving, storing, and disseminating inputs to the product, e.g., material handling, warehousing
E3	Cost of transforming inputs into the final product, e.g., machining, assembly
E5	Cost of collecting, storing, and distributing the product to customers, e.g., order processing, scheduling
E6	Cost of providing service to maintain or enhance the value of the product, e.g., installation, repair
Factor 2: SUPPORT ACTIVITY EFFICIENCY (SAE)	
	Impact of the application of the following:
E8	Cost of recruiting, hiring, training, development, and compensation of personnel
E9	Cost of general management activities, e.g., planning, finance
E10	Cost of coordinating different activities, such as purchasing, processing, marketing, sales, etc.
Factor 3: RESOURCE MANAGEMENT FUNCTIONALITY (RMF)	
	Impact of the application on the ability of primary users to:
F9	Monitor the use of resource, i.e., keep track of the utilization of the resources
F10	Upgrade the resource if necessary, i.e., add to the resource
F12	Transfer or dispose of the resource
F13	Evaluate the overall effectiveness or usefulness of the resource
Factor 4: RESOURCE ACQUISITION FUNCTIONALITY (RAF)	
	Impact of the application on the ability of primary users to:
F4	Order or put in a request for the resource
F6	Acquire the resource, i.e., be in physical possession of the resource
F7	Verify that the resource meets the specifications, i.e., test the resource for a match with the needs
Factor 5: THREAT (THRT)	
T1	Costs which the company would incur if it changed to alternate suppliers
T3	Your company's ability to evaluate various suppliers and choose the most appropriate supplier
T4	Your company's ability to threaten vertical integration, i.e., threaten to perform some of the some of the functions performed currently by its suppliers or customers
T5	Your company's ability to evaluate various customers and choose the most appropriate customers
T6	Cost which customers would incur if they change to alternate suppliers
T7	Customer's cost of locating alternate suppliers
Factor 6: PREEMPTIVENESS (PRMPT)	
P2	The system provides unique access to channels, such as brokers, distributors, or retailers
P4	The system's market positioning is such that competitors are forced to adopt less favorable postures
P5	The system is protected from imitation by institutional barriers such as patents, copyrights, and trade secrets
P6	The system has influenced the development of technical standards and practices in the industry
Factor 7: SYNERGY (SYNRG)	
S1	The system is aligned with your organization's business strategy
S2	The system is aligned with your company's marketing policies and practices
S3	Your firm has technical expertise in the area of application
S4	Top management is involved in and supports the system
S5	Your firm has the ability to continuously innovate and enhance the application

Note. From "Development of Measures to Assess the Extent to Which an Information Technology Application Provides Competitive Advantage", by V. Sethi and W. F. King, 1994, Management Science, 40(12), 1611. Reprinted with the permission of the author.

Measuring Firm Performance

The dependent variable of interest of this study is export performance. Three measures of performance are used to investigate the performance of the trading companies. Export sales are chosen to be one of the measures of a firm's performance. The other two measures

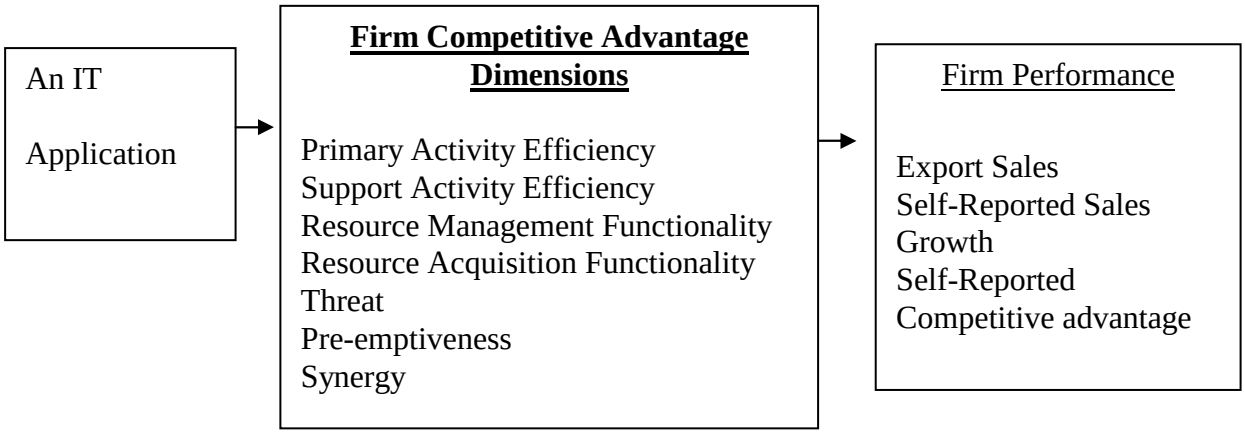
are self-reported company's sales growth and self-reported competitive advantage data obtained from the returned surveys.

Trading companies export sales data from 1999 through 2001 are obtained through the Department of Statistics of the Brazilian Department of Commerce. Although export sales data of companies in Brazil are restricted to government officials, the Department of Commerce coordinator agreed to release that information on the understanding that they are going to be used strictly for research purposes. Further, considering the number of trading companies that usually go out of business within a short period of time, new market entrants, and the difficulty to obtain useful export sales data from multiple years, this study uses average export sales of a three-year period to analyze performance.

Independent Variables

The measures of CAPITA are the independent variables to analyze competitive advantage. These variables are – primary activity efficiency, support activity efficiency, resource management functionality, resource acquisition functionality, threat, preemptiveness, and synergy. The research design is shown in Figure 1.

Figure 1: Research Design



Hypotheses

The proposed framework suggests that trading companies can achieve competitive advantage from an information technology application. Competitive advantage is measured by the seven CAPITA dimensions (primary activity efficiency, support activity efficiency, resource management functionality, resource acquisition functionality, threat, pre-emptiveness, and synergy), which are measured by 29 questionnaire items. The framework shown in Figure 1 illustrates the research design and the relationships among the variables.

Primary Activity Efficiency

Primary activities of a company are inbound logistics (inputs), operations, outbound logistics (storage and distribution), marketing and sales, and service (Porter, 1985). These primary activities are sequenced and value is added to each activity, as referred to by the value-chain model. An information technology application can help inbound and outbound logistics, thus providing managers with information about suppliers, customers and competitors.

With the use of information technology systems, trading company's managers collect information about inventory of specific products throughout the world. By combining this field data with information from each stage of the value chain they can better determine levels

of inbound supplies of raw materials, and allocate the company's service activities across available demand. The trading companies can also use this information to identify market opportunities and react to environmental pressures and competitive forces. Through the global network, and drawing on long experience in carrying out trade transactions, the trading companies are able to gather and analyze information, process order quickly and provide services accurately. Besides, trading companies connected to manufacturers are able to provide them with precise information about customers' needs. The trading companies are therefore able to integrate the system both upstream and downstream. This leads to the first hypothesis relating to the impact of a firm's primary activity efficiency on the performance of the trading companies:

Hypothesis 1

There is a positive correlation between primary activity efficiency and trading companies' performance.

Support Activity Efficiency

Support activity efficiency across the value chain helps to sustain primary activities. Support activities are comprised of firm infrastructure (accounting, finance, and management), human resources management, technology development and procurement. Information technology changed dramatically the way trading companies do business. Technology eliminated non-sophisticated work, with the electronic mail system reducing some of the paper work, changing the workflow, compensation policies, hiring and training needs. As more and more multinational companies require immediate access to information systems, residing in computer systems of trading companies, they have to carefully integrate their own internal processing systems, making investments or developing their own information systems, which affects some managerial functions, such as accounting and finance. Moreover, with the use of information technology applications, trading companies can adhere to their suppliers' systems, which may have an impact on their procurement costs. This leads to the following hypothesis:

Hypothesis 2

There is a positive correlation between support activity efficiency and trading companies' performance.

Resource Management Functionality

Functionality means the extent to which an information technology application provides the functionality desired by users. Functionality incorporates the concepts of differentiation (Porter, 1980a), customer service (Ives & Learmonth, 1984) and adding value to customers (Clemons & Kimbrough, 1986).

Resource management functionality refers to the extent to which an information technology application assists its primary users in monitoring utilization, upgrading, transferring, disposing or accounting for a resource. The resource management functionality is concerned with the post-acquisition of the resource, which is being increasingly regarded as a source of competitive advantage.

The use of an information technology application plays an important role in differentiating products and services. The information revolution is changing the nature of business and affecting competition by changing industry structure; creating competitive advantages by lowering costs or enhancing differentiation, and spawning new business (Porter & Millar, 1985b). Many times in specific industries there are groups using the strategy of differentiation that affects competitive position and performance. The Internet, for example,

opens opportunities for trading companies to embrace different strategic positions, different features and services through integration with business and customers. Trading intermediaries with high levels of resource management functionality will have more chances to innovate, differentiate their services from the competition and consequently retain their customers. This leads to the following hypothesis:

Hypothesis 3

There is a positive correlation between resource management functionality and trading companies' performance.

Resource Acquisition Functionality

This trait refers to the extent to which an application of information technology increases the user's ability to order a resource, acquire it and verify its acceptability. The use of the Internet and the electronic mail can automate ordering, paying and acquiring goods and services. Banham (2000) argues that the strong potential of goods transacted globally, using electronic commerce has challenged strategists' creativity. It is remarkable, for example, the application of B2B to international freight businesses, which deliver cheaper ordering and acquisition costs to trading companies by consolidating their international cargoes with a smaller number of suppliers. The truth of the matter is that some information technology applications allow carriers to respond to the trading companies query, thus eliminating the user's work to contact dozens of carriers and freight forwarders by phone or fax to obtain a quote. Hence, an information technology application that supports the user's needs, can be a source of competitive advantage to trading companies due to their impact on ordering and acquisition of resources. This leads to the following hypothesis:

Hypothesis 4:

There is a positive correlation between resource acquisition functionality and trading companies' performance.

Threat

Threat refers to the extent to which an information technology application enables a firm to exert power over its customers and suppliers. According to Perry (1992) the relationship between the manufacturer and the trading company revolves around power. The manufacturer and the trading company come together because it is profitable for them to do so. The manufacturer is responsible for the fabrication of products, while the trading company exports them. This creates a dependency of the manufacturer in relation to the trading company, which should be cultivated. Nevertheless, in many cases, the manufactures have a strong trend to go directly to their customers, thus bypassing the trade intermediaries. The trading companies, however, should try to prevent access by the manufacturers to information needed to initiate the export process by themselves. The success of a trading company depends on the company's ability to manage the dependency conflict with customers and evaluate suppliers. Threat increases the dependence of customers and manufactures on the firm, thus contributing to higher profitability. This leads to the following hypothesis:

Hypothesis 5:

There is a positive correlation between threat and trading companies' performance.

Pre-emptiveness

Pre-emptiveness refers to extent to which an information technology application provides the firm an early and successful strike in the market. This trait enables a firm to enjoy first-mover advantage (Porter, 1980a). To have a satisfactory performance, the trading

companies must have a winning strategy, which includes sound market knowledge and the capacity to implement frequent product updating to accommodate customers' growing sophistication (Perry, 1992). To become a market specialist requires, however, hard work and speed to introduce a product in the market in order to cope with the pace of changes of the trading environment and match the demands of foreign buyers. On the other hand, Teece (1997) posits that performance is very much related to systems and routines, which include gathering and processing information for linking customer experiences with firm's procedures, channels, brokers, suppliers and final users. Hence, competitive advantage is a function of the way and speed assets and resources are mustered and organized in a changing market. This leads to the following hypothesis:

Hypothesis 6:

There is a positive correlation between pre-emptiveness and trading companies' performance.

Synergy

Synergy refers to the extent to which an information technology application is aligned with the firm's business strategy and innovation makes it difficult for competitors to copy the application. Researchers in international business have pointed out that the firm's strategy and its information-processing requirements must be in alignment with the firm's structure and information-processing capabilities. To succeed in helping a global firm's control and coordination, information technology must be aligned with global information management strategy. The study carried out by Karimi & Konsynski (1991) shows that the greatest impact of technology is on the change of coordination mechanisms. A proper design of critical linkages among the firm's value chain activities results in an effective business design, comprising information technology and a better coordination with the firm's partners. By aligning strategy with information system strategy, the organization may improve its strategic positioning, effectiveness, efficiency and performance. In the case of the trading companies, the alignment of an information technology application with an organization's business strategy, marketing policies and practices, as well as the environment represent meaningful resources and capabilities. And it is the value, uniqueness and hard-to-imitate nature of those resources and capabilities, which give rise to competitive advantage of the trading companies. This leads to the following hypothesis:

Hypothesis 7:

There is a positive correlation between synergy and trading companies' performance.

Sampling Frame

The data sample collection strategy surveys a total of 190 companies, members of the Brazilian Association of Trading Companies (ABECE). Using the CAPITA survey instrument, respondents are asked to provide their agreement or disagreement with several statements based on a Likert scale from 1 to 7. The survey is used to measure the executive's understanding of the impact of the information technology on different dimensions of competitive advantage.

Data Collection Procedures

This study uses a mail questionnaire accompanied with a letter of introduction and explanation to examine the impact of global information technology on competitiveness of trading companies. The questionnaire is directed to top information systems executives, CIOs, and to CEOs. To improve response rates, an enclosed envelope was provided.

Additionally, a follow-up reminder letter and another questionnaire were mailed to non-responders after a two-week period in an attempt to improve the response rate.

4. ANALYSIS AND PRESENTATION OF FINDINGS

This study employs several methods, including t-tests, factor analysis and regression analysis. Independent t-tests were used to compare the means of the export sales measures of the responding and non-responding groups of firms. Factor analysis is used as a data reduction technique that allows the researcher to ensure construct validity and summarize a larger number of variables with a smaller number of underlying dimensions called factors. Multiple regression analysis is employed to identify the factors that are significantly related to the dependent variables.

Survey Response Rates

Questionnaires were mailed to CEOs and CIOs of all the trading companies registered in the Brazilian Department of Commerce - DECEX. Several steps were taken to improve the response rate. First, the anonymity of the respondents is guaranteed, and they were not asked to reveal their identity. Second, a summary of the findings was promised to be mailed to the respondents. Third, postage-paid envelopes were enclosed in the envelope containing the questionnaires. Fourth, follow-up phone calls were made and faxes as well as emails were sent to CEO's and CIO's to convince them to respond the questionnaire. Out of a total of 195 surveys sent out, 75 were returned because of incorrect addresses or expired mail-forwarding. According to information of the Brazilian Association of Trading companies- ABECE, the number of trading companies regularly operating in Brazil is about 120, therefore attrition of 70 companies can be assumed. From the total current population of 120 companies, 32 responses were received. Therefore, the number of complete surveys yielded a response rate of approximately 27% (32/120). This response rate compared very favorably with other similar studies, for example, Peng (1998), with a response rate of 21.3 percent and Sethi and King (1994), with a response rate of 24%.

The results of the t-tests indicate that there is no significant difference between the responding and non-responding companies as far as export sales are concerned. The low-score of the t-tests and high p-values reveal that there is no significant difference between the means of the performance measures (export sales) of responding and that of non-responding firms. Table 2 shows the results of the independent t-tests.

Table 2: Independent t- Tests

	TYPE	N	Mean	Std. Deviation	Std. Error Mean
YEAR 99	respondent	20	6.2E+07	8.4E+07	2.E+07
	nonrespondent	69	6.2E+07	2.0E+08	2.E+07
YEAR 2000	respondent	19	4.3E+07	4.2E+07	1.E+07
	nonrespondent	63	6.6E+07	2.1E+08	3.E+07
YEAR 2001	respondent	17	5.3E+07	6.8E+07	2.E+07
	nonrespondent	56	6.7E+07	2.2E+08	3.E+07

Trading Companies Performance

A set of dependent variables is used to determine trading company performance. On the whole, three measures of performance are used as dependent variables for the regression

analysis. Export sales data are obtained from an official department of the Brazilian government responsible for exports statistics. The other two measures are self-reported company's sales growth and self-reported competitive advantage data obtained from the returned surveys.

Factor Analysis

The Principal Component model of factor analysis is initially used, then Varimax rotation was employed to generate clearer, interpretable scores and factor loadings. The final numbers of factors are obtained through the analysis of the correlation matrix. This analysis results in a five-factor solution accounting for 79.42 percent of the total variability of data. Each of the five factors has eigenvalues greater than one. Table 4 displays the percent of variance explained by each factor, and the factor loadings of each of the independent variables. Table 5 displays the results of the principal component factor analysis after varimax rotation.

Table 3: Rotated factor analysis

Rotated Component Matrix[a]

	Component				
	1	2	3	4	5
V1				.844	
V2				.752	
V3				.538	
V4				.613	
V5	.738				
V6	.623				
V7	.814				
V8	.736				
V9	.716				
V10	.870				
V11	.836				
V12	.772				
V13	.697				
V14	.736				
V15		.704			
V16			.605		
V17		.528			
V18			.774		
V19					.754
V20					.695
V21		.698			
V22		.620			
V23		.737			
V24		.666			
V25		.905			
V26		.880			
V27			.667		
V28			.682		
V29			.607		

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 10 iterations.

Table 4: Factor Loadings

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	15.21	52.46	52.46	15.21	52.46	52.46	7.244	24.98	24.98
2	3.632	12.52	64.98	3.632	12.52	64.98	5.850	20.17	45.15
3	1.686	5.814	70.79	1.686	5.814	70.79	3.905	13.47	58.62
4	1.339	4.618	75.41	1.339	4.618	75.41	3.037	10.47	69.09
5	1.163	4.010	79.42	1.163	4.010	79.42	2.995	10.33	79.42
6	.911	3.141	82.56						
7	.885	3.052	85.61						
8	.813	2.803	88.42						
9	.534	1.841	90.26						
10	.443	1.526	91.78						
11	.400	1.378	93.16						
12	.334	1.151	94.31						
13	.305	1.053	95.36						
14	.257	.885	96.25						
15	.228	.785	97.03						
16	.181	.625	97.66						
17	.152	.524	98.18						
18	.132	.457	98.64						
19	.114	.392	99.03						
20	.074	.256	99.29						
21	.061	.212	99.50						
22	.048	.165	99.66						
23	.037	.127	99.79						
24	.026	.090	99.88						
25	.017	.058	99.94						
26	.011	.039	99.98						
27	.004	.013	99.99						
28	.002	.006	100.0						
29	.001	.004	100.0						

Extraction Method: Principal Component Analysis.

Table 5: Factor Analysis results (after varimax rotation)

FACTOR 1 – Support efficiency and Resource functionality	
Items	
E8	Cost of recruiting, hiring, training, development, and compensation of personnel
E9	Cost of general management activities, e.g., planning, finance
E10	Cost of coordinating different activities, such as purchasing, processing, marketing, sales, etc.
F9	Monitor the use of resource, i.e., keep track of the utilization of the resources
F10	Upgrade the resource if necessary, i.e., add to the resource
F12	Transfer or dispose of the resource
F13	Evaluate the overall effectiveness or usefulness of the resource
F4	Order or put in a request for the resource
F6	Acquire the resource, i.e., be in physical possession of the resource
F7	Verify that the resource meets the specifications, i.e., test the resource for a match with the needs
FACTOR 2 – Sustainability	
Items	
T1	Costs which the company would incur if it changed to alternate suppliers
T4	Your company's ability to threaten vertical integration, i.e., threaten to perform some of the functions performed currently by its suppliers or customers
P2	The system provides unique access to channels, such as brokers, distributors, or retailers
P4	The system's market positioning is such that competitors are forced to adopt less favorable postures
P5	The system is protected from imitation by institutional barriers, such as patents, copyrights, and trade secrets
P6	The system has influenced the development of technical standards and practices in the industry
S1	The system is aligned with your organization's business strategy
S2	The system is aligned with your company's marketing policies and practices
FACTOR 3 - Network capacity	
Items	
T3	Your company's ability to evaluate various suppliers and choose the most appropriate supplier
T5	Your company's ability to evaluate various customers and choose the most appropriate customers
S3	Your firm has technical expertise in the area of application
S4	Top management is involved in and supports the system
S5	Your firm has the ability to continuously innovate and enhance the application
FACTOR 4 – Primary activity efficiency	
Items	
E2	Cost of receiving, storing, and disseminating inputs to the product, e.g., material handling, warehousing
E3	Cost of transforming inputs into the final product, e.g., machining, assembly
E5	Cost of collecting, storing, and distributing the product to customers, e.g., order processing, scheduling
E6	Cost of providing service to maintain or enhance the value of the product, e.g., installation, repair
FACTOR 5 – Suppliers' switch	
Items	
T6	Cost which customers would incur if they change to alternate suppliers
T7	Customer's cost of locating alternate suppliers

Internal Reliability

To confirm the internal validity of the constructs, Cronbach's Alpha was calculated for each construct derived from the factor analysis. The Cronbach's Alpha scores measure the degree of consistency (covariance) between the items in that construct (internal reliability). The Cronbach's Alpha and a summary of the constructs are listed in Table 6.

Table 6: Internal Reliability of the Factors

Construct	Factor	Cronbach's Alpha
Support efficiency and resource functionality	1	0.9554
Sustainability	2	0.9376
Network capacity	3	0.9011
Primary efficiency	4	0.8999
Suppliers switch	5	0.8284

As depicted in Table 6, all factors met reasonable standards on internal consistency and reliability. According to (Nunnally, 1978), .70 is normally considered to be the lower acceptable limit for Cronbach's alpha.

Hypotheses Testing and Results

This study uses two procedures to analyze data: factor analysis to ensure construct validity and reduce the variables to a small number of factors, and multiple regressions to identify the factors that are significantly related to the dependent variables.

The reduced factor structure of the sample of the trading companies is displayed in Table 3. All non-significant loadings have been deleted. As indicated in Table 5, five factors were retained. For ease of reading items are grouped according to significant factor loadings. Overall, the threat questions seem to be most fragmented. Two questions of threat are loaded on factor 2, other two questions on factors 3 and factor 5, respectively. Further, synergy questions are also fragmented, having two questions loaded on factor 2, and 3 questions on factor 3.

The variables loading on factor 1 capture support activity efficiency, resource management functionality, and resource acquisition functionality. Thus, factor 1 can be labeled as *support efficiency and resource functionality*. Factor 2 contains all the variables shown in preemptiveness, and expands on two items of threat and two items of synergy. This pattern is consistent with Sethi and King's (1984) description of a construct, which influences threat, preemptiveness and synergy, named sustainability. Therefore, factor 2 is named as *sustainability*. The third factor includes two items of threat and three items of synergy, all carrying approximately equal factor scores. It can be seen that factor 3 variables also reflect the manager's ability to evaluate both suppliers and customers, using the system as their main tool. According to the field research, top management is involved in the negotiation process with suppliers and customers, so that there is an adherence of the trading company's system with their partners. Factor 3 is then labeled as *network capacity*. Factor 4 encompasses all the variables shown in primary activity efficiency, thus best be labeled as *primary efficiency*. The final factor encompasses two items relating to the costs of locating and choosing alternate suppliers. Therefore, factor 5 can be named as *suppliers switch*.

Multiple Regression Model

The hypotheses to investigate the impact of information technology on competitiveness of the trading companies were tested by using multiple regression analysis. The varimax transformation produces orthogonal factors, which are independent of each other, thus interactions between those factors are eliminated and multicollinearity is avoided when computing multiple regressions. All five factors are employed as independent variables to be regressed against average export sales, company sales growth, and company competitive advantage. Each factor is tested three times.

Table 7: Summary of the Hypothesis Tests

Tests using Three Different Dependent Variables as Firm Performance Results		
Model 1: Factor 1 as Independent Variable		
Test I: Average Export Sales	Supported	*
Test II: Self-Reported Sales Growth	Supported	**
Test III: Self-Reported Competitive Advantage	Supported	***
Model 2: Factor 2 as Independent Variable		
Test I: Average Export Sales	Not Supported	
Test II: Self-Reported Sales Growth	Not Supported	
Test III: Self-Reported Competitive Advantage	Supported	****
Model 3: Factor 3 as Independent Variable		
Test I: Average Export Sales	Not Supported	
Test II: Self-Reported Sales Growth	Not Supported	
Test III: Self-Reported Competitive Advantage	Not Supported	
Model 4: Factor 4 as Independent Variable	Not Supported	
Test II: Self-Reported Sales Growth	Not Supported	
Test III: Self-Reported Competitive Advantage	Not Supported	
Model 5: Factor 5 as Independent Variable		
Test I: Average Export Sales	Not Supported	
Test II: Self-Reported Sales Growth	Not Supported	
Test III: Self-Reported Competitive Advantage	Not Supported	

* $p<0.05$
** $p<0.03$.
*** $p<0.01$
**** $p<0.04$

5. CONCLUSIONS

The five factors derived from the factor analysis were regressed three times to test the predictive associations of each factor with average export sales, self-reported company sales growth, and self-reported competitive advantage. This study adopted Peng's (1998) criterium, which suggests that only repeated passing of multiple tests can give adequate confidence to the model.

Research hypothesis 1 proposed that there should be a positive correlation between primary activity efficiency and trading companies' performance. As seen in Table 7 factor 4 (primary activity efficiency) is not correlated with any measures of performance, therefore, original hypothesis 1 is not supported.

Research hypothesis 2 proposed that there should be a positive correlation between support activity efficiency and trading companies' performance. Research hypothesis 3 proposed that there should be a positive correlation between resource management

functionality and trading companies' performance. Research hypothesis 4 proposed that there should be a positive correlation between resource acquisition functionality and trading company's performance. As seen in Table 7 factor 1 (*support activity efficiency and resource functionality*) is significantly correlated with the three measures of performance – average export sales, company's sales growth, and self-reported competitive advantage. Only factor 1, which encompasses all variables contained in the study original hypotheses 2, 3 and 4, passed the three tests. The directions of the signs of all significant coefficients are in agreement with those hypotheses as well.

Research hypothesis 5 proposed that there should be a positive correlation between threat and trading companies' performance. The variables of threat were split up among factors 2, 3, and 5 as shown in Table 5. As seen in Table 7 the latter factors did not pass the three tests of performance, thus hypothesis 5 is not supported.

Research hypothesis 6 proposed that there should be a positive correlation between preemptiveness and trading companies' performance. The variables related to preemptiveness were concentrated on factor 2, which received only mild support. As seen in Table 7, factor 2 did not pass the three tests of performance, thus hypothesis 6 is not supported.

Research hypothesis 7 proposed that there should be a positive correlation between synergy and trading companies' performance. The variables related to synergy were concentrated on factors 2 and 3. Both factors did not pass the three tests of performance, thus hypothesis 7 is not supported.

6. SUMMARY OF THE RESEARCH

The purpose of this study was to analyze whether information and communication technologies affect the performance of trading companies. The study examined trading companies operating in Brazil because of the related experience and interest of the researchers.

The findings suggest that some CAPITA dimensions have a strong relationship with the trading company's performance. Empirical evidence is found that investments in information technology application are used to achieve some aspects of competitive advantage and performance of the companies. The results of the investigation confirm that an information technology application, measured by CAPITA dimensions – support activity efficiency, resource management functionality, and resource acquisition functionality have a strong impact on the performance of the trading companies.

Sethi & King (1994) state that the relationship between support activity efficiency to competitive advantage may be attributed to the fact the few firms understand that lowering costs may provide a competitive advantage in relation to competitors. This study confirms that trading companies in Brazil use information technology to reduce the costs of recruiting, hiring, training, developing, and compensating personnel, thus potentially achieving competitive advantage. They also lower the costs of other support activities, such as general management, finance and planning, as well as the costs of purchasing, processing, marketing and sales. This means that trading companies are investing in information technology applications to reduce costs of their support activities in the value chain.

Resource management functionality is described by Sethi & King (1994) as concerned with the post-management acquisition of the resource. The empirical results confirm that an information technology application measured by CAPITA resource management functionality plays an important role in differentiating products and services. The Internet, for example, opens opportunities for trading companies to embrace different strategic positions, and services through integration with business and customers. The research findings confirm that

information technology measured by CAPITA resource management functionality provides trading companies with the ability to innovate, differentiate their services, and gain competitive advantage.

Resource acquisition functionality consists of the impact of the information technology application on the user's ability to order a resource. The use of Internet and electronic mail, for example, can automate ordering, paying and acquiring goods and services. Managers of trading companies may order and acquire cheaper international freight by using a smaller number of suppliers from an information technology application. The results of the empirical research confirm that an information technology application, measured by CAPITA resource acquisition functionality that supports user's needs, is a source of competitive advantage due to their impact on ordering and acquiring of resources.

5. IMPLICATION FOR MANAGERS

Based on this sample of 32 trading companies, it is possible to state that 52.46 percent of the variance in response can be attributed to CAPITA dimensions - support activity efficiency, resource management functionality, and resource acquisition functionality.

In spite of the growing investment in information technology, Drucker (1999) posits that only by understanding the meaning and purpose of information, managers will be able to redefine the tasks to be done and their institutions. Consequently, managers of the trading companies should include in their strategy discussion about support activity efficiency, both resource management functionality, and resource acquisition functionality. By understanding that the performance of trading companies is strongly correlated with the way information technology application is used to improve support activity efficiency and functionality, managers may allocate resources and formulate a strategy to gain competitive advantage.

This study hopes to raise new questions and enhance the level of research into information technology implementation. With a better knowledge of the generation of competitive advantage, it is expected that managers of trading companies may make the best use of human and financial resources, purchasing, marketing, and sales resources that help companies to achieve competitive advantage and superior performance. The results of this study lead to the supposition that information technology has the potential to be used in a direct strategic move to improve performance through creative implementation.

7. LIMITATIONS OF THE STUDY

This study has several limitations that must be acknowledged. First, the sample collected from the population of 120 trading companies is not a random sample. In order to assess the representativeness of this sample, the means of the responding and non-responding firms are compared with regard to their export sales. The results of the t-tests, however, showed that there was no significant difference between the responding and non-responding companies. Second, the measures of sales growth rate, and competitive advantage, which are used along with average export sales as dependent variables, represent the perceptions of the survey respondents. These are subjective responses, provided by the owners, directors, and managers of the trading companies, and may be biased. Lastly, it is impossible to limit the effects of unrelated events to the financial data. For example, export sales of trading companies may have decreased or increased due to other factors rather than to the proper use of information technology. The CEO of one of the trading companies, who was interviewed during the field research, informed the author that export sales have decreased due to new barriers and sanctions imposed by governments of their main target market. On the other

hand, firms may have increased their export sales and revenues due exclusively to elimination or reduction of tariff barriers and not due to an application of information technology.

Despite these limitations, this study does stand as one of the first exploratory studies that directly test hypotheses from an instrument that measures competitive advantage in an international business environment. Future research can benefit from the inclusion of trading companies from other countries, and comparisons between countries might reveal differences on the impact of culture on the application of information technology.

7. RECOMMENDATIONS FOR FUTURE RESEARCH

This study indicates that managers may not be well prepared to make the best use of an information technology application. Regarding primary activity efficiency it may be possible that managers do not know how to use information technology effectively to reduce the costs of receiving, storing, distributing the product to customers, and providing service to maintain or enhance the product. Regarding threat, it may be possible that managers are not well prepared to use information technology to evaluate various suppliers, may threaten to perform some of the functions performed currently by its customers, and may show their customers the costs they would incur if they change to alternate suppliers. Regarding synergy, it may be possible that managers are not well prepared or do not understand the importance of aligning the system with the organization business strategy, and marketing policies and practices. Clarke (1989) confirms that the role of the CEO is crucial to the success of information technology and managers may not understand or implement in conjunction with strategy.

These results may suggest that the impact of new technology is not felt immediately. This idea is consistent with other studies which found that information technology has little or no impact on business in the same year that the investments were made (Brynjoolfsson, Malone, Gurbaxani, & Kambil, 1994). Therefore, one area of inquiry concerns the evolution of the use of information technology applications over time. Future research should attempt to identify patterns of success from the use of information technology as trading companies become more experienced in the strategic use of information technology. Empirical work in this area may help answer some questions and would have enormous implications for both theory and practice. This research can also be replicated in different settings; for instance, in a multi-country study in order to trace the impact of information technology on competitiveness of trading companies caused by environmental factors.

REFERENCES

Baker, S. 1999. Global e-commerce, local problems. *The Journal of Business Strategy, 20*(4),32-38.

Barney, J. B. 1995. Looking inside for competitive advantage. *The Academy of Management Executive, 9*(4), 49-59.

Bartlett, C. A., & Ghoshal, S. 1993. Beyond the M-form: toward a managerial theory of the firm. *Strategic Management Journal, 14*, 23-46.

Brynjoolfsson, E., Malone, T. W., Gurbaxani, V., & Kambil, A. 1994. Does information technology lead to smaller firms? *Management Science, 40*(12), 1628-1644.

Chatterjee, S., & Wernerfelt, B. 1991. The link between resources and type of diversification:

Theory and evidence. *Strategic Management Journal, 12*, 33-48.

Clarke, R. 1989. *Congruence between strategy, information technology and decision-making at the unit level: a comparison of U.S.A. and Canadian retail banks.* Published Dissertation, University of Massachusetts, Amherst.

Dell, M., & Fredman, C. 1999. *Direct from Dell: strategies that revolutionized an industry*. New York: HarperCollins Publishers, Inc.

Drucker, P. F. 1999. *Management Challenges for the 21st Century*. New York: Harper Collins.

Dryden, J. 1998. Realising the potential of global electronic commerce. *OECD Observer, 8*(214), 20-23.

Dunning, J. H. 1998. Location and the multinational enterprise: A neglected factor? *Journal ofInternational Business Studies, 29*(1), 45-66.

Gecowets, G. A., & Bauer, M. J. 2000. The e-ffect of the Internet on supply chain and logistics. *World Trade, 13*, 71-80.

Ghoshal, S., & Bartlett, C. A. 1999. A new manifesto for management. *Sloan Management Review, 40*(3), 9-20.

Ghoshal, S., & Westney, E. D. 1991. Organizing competitor analysis systems. *Strategic Management Journal, 12*, 17-31.

Grover, V., & Ramanlal, P. 1999. Six myths of information and markets: Information technology networks, electronic commerce and the battle for consumer surplus. *MIS Quarterly, 23*(4), 465-495.

Harvey, M. G., Speier, C., & Novicevic, M. M. 1999. The impact of emerging markets on staffing the global organization: A knowledge-based-view. Journal of International Management, 5, 167-186.

Hutchinson, M. 1998. E-commerce set to explode. *New Zealand Management, 45*(9), 61-67.

Ives, B., & Jarvenpaa. 1991. Applications of global information technology: key issues for management. *MIS Quarterly*(March 1991), 33-49.

Ives, B., & Learmonth, G. P. 1984. The information system as a competitive weapon. *Communications of the ACM, 27*(12), 1193-1201.

Jolly, D. 2000. Three generic resource based strategies. *International Journal of Technology Management, 19*(7,8), 773-787.

Karimi, J., Gupta, Y. P., & Toni, M. 1996. Impact of competitive strategy and information technology maturity on firms' strategic response to globalization. *Journal of management Information Systems, 12*(4), 55-81.

Karimi, J., & Konsynski, B. R. 1991. Globalization and Information Management Strategies. *Journal of Management Information Systems, 7*(4), 7-26.

King, W. R., & Sethi, V. 1993. Developing transnational information systems: A case study. *OMEGA International Journal of Management Science, 21*(1), 53-59.

Lee, Y. W., Madnick, S. E., & Wang, Y. R. 1991. Beyond the globalization of information technology: The life of an organization and the role og information technology. *Journal of Information Technology Management, II*(1), 1-10.

Markides, C. C., & Williamson, P. J. 1996. Corporate Diversification and Organization Structure: A resource-based view. *Academy of Management Journal, 39*(2), 340-367.

Mata, F. J., Fuerst, W. L., & Barney, J. B. 1995. Information technology and sustained competitive advantage: A resource-based analysis. *MIS Quarterly, 19*(4), 487-494.

Mc Grath, R. G., MacMillan, I. C., & Venkatamaran, S. 1995. Defining and developing competence: A strategic process paradigm. *Strategic Management Journal, 16*, 251275.

Nunnally, J. C. 1978. *Psycometric Theory*. New York: McGraw Hill.

Peng, M. W. 1998. *Behind the success and failure of U.S. export intermediaries: transactions,*

agents, resources. Westport: Quorum Books.

Penrose, E. 1959. *The theory of the growth of the firm*. Oxford.

Perry, A. C. 1992. *The evolution of U.S. trade intermediaries: The changing international environment*. Westport: Quorum Books.

Piercy, N. F., Kaleka, A., & Katsikeas, C. S. 1998. Sources of competitive advantage in high performing exporting companies. *Journal of World Business, 33*(4), 378-393.

Pitt, M., & Clarke, K. 1999. Competing on competence: A knowledge perspective on the management of strategic innovation. *Technology Analysis & Strategic Management, 11*(3), 301-316.

Porter, M. 1985. *Competitive Advantage*. New York: Free Press.

Porter, M. E. 1980. *Competitive Strategty: Techniques for analyzing industries and competitors*. New York: Free Press.

Porter, M., & Millar, V. E. 1985. How information gives you competitive advantage. *Harvard Business Review* (July-August), 149-160.

Powell, T. C., & Dent-Miccallef, A. 1997. Information technology as competitive advantage:

the role of human, business, and technology resources. *Strategic Management Journal, 18*(5), 375-403.

Prahalad, C. K., & Oosterveld, J. P. 1999. Transforming internal governance: The challenge for multinationals. *Sloan Management Review, 40*(3), 31-39.

Rumelt, R. P. 1984. *Towards a strategic theory of the firm*. Englewood Cliffs: Prentice-Hall.

Sethi, V., & King, W. 1994. Development of measures to assess the extent to which an information technology application provides competitive advantage. *Management Science, 40*(12), 1601-1624.

Sowinski, n. L. 2000. Sourcing over the Internet. *World Trade, 13,* 34-36.

Spender, J. C. 1996. Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal, 17*(Winter Special Issue), 45-62.

Teece, D. J. 1984. Economic analysis and strategic management. *California Management Review, 26*(3), 87-110.

Teece, D. J. 1997. Dynamic capabilities and strategic management. *Strategic Management Journal, 17*(7), 509-533.

Weill, P., & Broadbent, M. 1998. *Leveraging the new infrastructure: How market leaders capitalize on information technology*. Boston: Harvard Business School Press.

Wenerfelt, B. 1984. A resource-based view of the firm. *Strategic Management Journal, 5*(2), 171-180.