Electronic Commerce: Enhancing Performance in Specialty Retailing

Electronic commerce is providing a number of companies an opportunity for improvements in efficiency and performance. Electronic commerce includes the support of markets, inter-firm coordination, and information exchange via electronic means. There are a variety of applications under the electronic commerce umbrella including automated teller machines, computer-assisted trading systems, airline reservations, electronic data interchange, the Internet, satellite, and multimedia.

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Buying and selling over such platforms as the Internet, on-line services like CompuServe, Prodigy, or America Online, new forms of electronic shopping under development by cable and telephone companies, private interorganizational networks using electronic data interchange (EDI), or other means of providing computer-mediated transactions over telecommunications networks are all examples of emerging electronic marketplaces.

An example of the impact of electronic commerce within a specific industry segment can be found in specialty retailing. Specialty retailers concentrate on specific products, services, or locations, competing with both large national chains and local mom and pop stores. The specialty retailer is involved in a number of significant linkages that can be enhanced through electronic connections. These connections have often been referred to within the retail industry as Quick Response (QR), a kind of retailing 'just-in-time' that links suppliers, manufacturers, vendors, distribution centers and retailers. A recent study of specialty retailers found the use of Quick Response to have significantly enhanced firm performance in terms of comparable store sales, sales per square foot, and stock turn [4].

This article explores the impacts of information technologies that support electronic commerce, including Quick Response, in specialty retailing. The following sections discuss the use of IT, the impact of electronic commerce on a group of specialty retailers, and RETEX, the retailing consortium that is providing its members the tools to effectively participate in electronic commerce initiatives.

Information Technology and Specialty Retailing

Information technology has the potential to provide specialty retailers, their suppliers and their customers with substantial improvements in operational effectiveness, quality improvement, and productivity. The opportunities for electronic integration of purchasing, selling and financial cycles provide numerous opportunities to improve the competitive position of specialty retailing firms and to support pipeline strategies. The use of information technology offers the opportunity for the specialty firms to 'level the playing field' with larger national competitors as well as provide the personalized service of the mom-and-pop stores [1].

Working with suppliers to control the flow of product, reduce inventories, and improve in-stock positions has been an important activity for many retailers. Increasingly, specialty retailers are using IT to identify new channels for distribution and access to customers. The advent of retailing cable TV channels such as QVC and Home Shopping Network and the opportunity these channels provide for interactive connections with customers, has led several key specialty retailers (including Sharper Image, Williams-Sonoma, and Liz Claiborne) to participate in this new approach to sales. However, some in retailing are not convinced that the new interactive connections will be a major influence on most retail shopping [3].

Customer-oriented IT

The use of telecommunications to maintain customer connections has played an important role for the specialty retailer. Telemarketing and customer service activities have become increasingly sophisticated. The telecommunications links with customer can often begin at the point of sale, with increasingly detailed mechanisms for capturing customer information and buying patterns. Frequent-shopper card programs, bar coding, UPC labeling and scanning technologies enable retailers to capture detailed customer information, to provide incentives for frequent shoppers, and to support micromarketing opportunities for targeted advertisement to specific customer segments.

Decision Support

Specialty retailing has adopted decision support systems (DSS) to provide information to managers and analysts throughout the merchandising chain. The most heavily developed uses for DSS have been in the area of buying and merchandise planning. Inventory managers and buyers are supported by DSS systems that coordinate inventory replenishment, sales forecasts and support of store promotions. Customer demographics have provided another key element to decision support systems development. The ability to target market at the SKU level has been an addition to many DSS.

Quick Response

Quick Response (QR) is a key element of electronic commerce in retailing. QR involves retailers deploying a variety of information technologies, including point-of-sale (POS), bar-coding, automated inventory management, electronic data interchange (EDI), and electronic invoicing. In a recent survey, Kurt Salmon & Associates [5], identified four levels or stages of QR (Table 1). The first level involves automated point-of-sale (POS), bar coding, universal product codes (UPC), automatic price look-up and electronic data interchange (EDI) for order entry and inventory management. A second level involves automatic replenishment by suppliers, forecasting and electronic invoicing. EDI at this stage includes order status, invoicing and advance shipment notices. Enhancements in stage three include using the information gleaned through the elements of the earlier stages for pre- and post-season planning, shipment container marking and arrangement. In the fourth stage, suppliers actually take over inventory management functions. This stage also includes seasonless retailing (the ability to provide all products on a year-round basis) and space management. A recent extension of the Quick Response perspective is Effective Customer Response [2]. This

Quick Response Level	Technologies and Applications
1	Automated point-of-sale, bar coding, universal product code, automatic price look-up, EDI for order entry and invertory management
2	Automatic inventory replenishment, forecasting, electronic invoicing, EDI for order status, invoicing and advance shipment notices
3	Pre- and post-season planning, shipment container marking and arrangement, cross-docking
4	Suppliers take over inventory management functions, seasonless retailing, space management

Table 1: Levels of Quick Response [5]

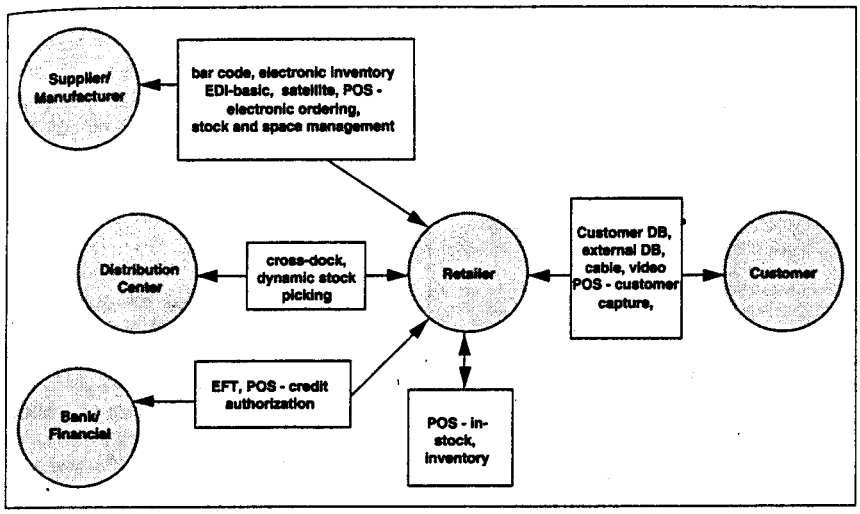

Figure 1: Electronic commerce information technologies in the retail pipeline

involves refining the information provided by the QR approach in defining inventory levels and working more closely with suppliers.

QR technologies are one type of inter-organizational system (IOS) which includes retailer, manufacturer, transporter, downstream supplier, and bank. QR can create an electronic market allowing each of these stakeholders to work as one virtual organization serving the ultimate consumer. Quick Response requires a commitment to share information and to cooperate with key suppliers and other providers. Electronic Data Interchange (EDI) is a key component of Quick Response systems. EDI establishes data formatting that allows the movement of business documents electronically between or within firms. This structured, machine-retrievable format permits data to be transferred, without rekeying, across software applications and business locations.

Quick Response is defined and used differently from firm to firm. Technologies and applications typically work together in meeting a particular company objective. These technologies can be used across the retailing including suppliers, distribution centers, banks, internal operations, and customers (see Figure 2).

Electronic Commerce: Performance Impact

In a survey of 75 specialty retailers, 35 firms were using at least level 1 QR technologies and applications [4]. These firms were compared to non-QR firms and were found to outperform the non-QR firms significantly on two key performance measures: comparable store sales growth and sales per square foot. The 17 firms implementing QR level 3 and 4 technologies showed even higher performance on three key measures: comparable store sales growth, sales per square foot, and stock turn.

The adoption of QR within specialty retailing is only at 47% in the study sample. Firms not adopting cite several key reasons including difficulty with the technology, lack of supplier IT sophistication, and difficulty in proving economic benefit. QR proponents will need to address these concerns before widespread adoption, particularly among smaller firms, occurs.

Key Learnings on Quick Response

1. Quick Response appears to have a positive impact on key performance measures, particularly performance measures related to efficiency and improved stock handling (new SKUs, stock turn, sales/s.f.).
2. Retailers with a smaller number of suppliers, with more of a commodity product, and actively involved with suppliers tend to adopt QR more readily, because it has a clear payoff.
3. Retailers with a large number of suppliers and more perishable or fashion-conscious products and more of an internal or end customer focus find it more difficult to adopt QR technologies.
4. The basic set of technologies and applications in specialty retailing include: POS, e-mail, UPC, bar coding, credit authorization.
5. The adoption of QR is influenced by supplier IT sophistication, ease of use, and economic benefit, the complexity of the product mix, and the relationships between MIS and operating departments including buying and store management.

In short, few companies use the entire range and the advanced stages of QR. The non-technological issues involved in sharing information with suppliers regarding inventory and sales have often kept suppliers from truly managing inventories and participating fully in the concepts of space management and seasonless retailing. Many retailing firms wait until technologies are ubiquitous and commoditized before they purchase and adopt them. POS is a good example of one of the few technologies that has reached this level.

Developing Electronic Commerce Capabilities

To provide access to more sophisticated applications, some firms are turning to the Internet. The Internet has become a valuable tool for those firms with less technological sophistication by reducing their requirements for building an internal infrastructure. Instead, the networks provide the technology and the technical expertise. Another approach available to firms is the industry consortium. In specialty retailing, RETEX, The Retail Technology Consortium provides access to a variety of advanced technologies including EDI, satellite, and advanced QR applications.

RETEX: An Electronic Commerce Consortium

The potential impact of electronic commerce has also been reflected in the growth of RETEX, an international consortium of retailers providing the group buying power and access to advanced technologies including voice, data, satellite, electronic funds transfer, and credit authorization. RETEX, The Retail Technology Consortium, has grown rapidly from an initial group of a dozen companies in late Fall 1992 to over 900 companies at the end of 1994. The prime movers in RETEX have been MIS executives

Trader Joe's	General Nutrition
Petrie Stores	Liz Claiborne
The Gap	Leslie Pools
Brookstone	Barnes & Noble
Musicland	U.S. Shoe
County Seat Stores	Charming Shoppes

Table 2: Prime movers in RETEX

at the initial twelve companies (Table 2):

RETEX is a non-profit, membership organization with a mission 'to provide member companies with high quality', 'best in practice', low cost technologies, products and services through cooperative buying arrangements. The consortium model has allowed member companies to begin to level the playing field versus their regional and national competition. RETEX members who are specialty retailers typically face strong competition from both major national retailers as well as local 'mom and pop' competitors. The model of the networked organ-

Area	Partner	Description
Voice	MCI AuditTel CallPoints	The MCI Voice deal was the original product of RETEX and has established an impressive record of building member minutes. RETEX is now MCI's second largest customer. In addition to the MCI deal, RETEX has voice-related deals with CallPoints and AudiTel.
Satellite	Hughes	The Mall SAT project is the result of RETEX's identification of satellite as a key component for retailers operating from numerous standalone locations. Hughes is the vendor of choice in developing a public satellite network. Initial installation is slated for the 1500 largest malls in the U.S.
Credit	NPC	The credit authorization project is a joint venture with NPC, one of the largest credit processing firms in the United States. The opportunity for all member companies to participate is high.

Table 3: RETEX product offerings

ization undertaken successfully at large national retailers including Wal-Mart, Sears, and J.C. Penney has provided these companies with substantial advantages in inventory management, cost structures and distribution. RETEX provides the technological tools for specialty retailers to capture the same advantages.

Impact

The impact of the consortium buying power has been tremendous. It has brought significant savings for firms with a handful of stores to several thousand stores as they now purchase telecommunications services at the rates of the consortium buying strength of tens of thousands of stores. The immediate impact of the RETEX advantage is in the area of cost reduction. The availability of the supporting information technology, including sophisticated telecommunications, provide an opportunity to support a number of additional organizational strategies including differentiation, growth, and alliances. The enhancements available through RETEX also provide member companies the opportunity to explore outsourcing, reengineering, and organizational learning initiatives. In providing information technology services and products to member companies, RETEX is also enabling these individual members to pursue a networked approach in dealing with suppliers, distributors, financial service providers, and customers (Table 3).

Conclusions

The specialty retailing arena is increasingly influenced by electronic commerce. Inventory management and in-store technologies had significant positive impacts on performance. The results of this study suggest that many specialty retailers are making IT an important part of company strategy. While many firms in specialty retailing have competitive advantages from other sources, the level of IT sophistication is increasing. The opportunities for IT use are also becoming more integrated across retailing operations. Electronic commerce has proven performance advantages and will be an increasingly common element in retailing operations. ■

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Empirical Survey of EDI Applied in Practice

Although the technology to transfer business information electronically between computers of different trading companies or organizations has existed for a long time, Electronic Commerce (EC) or Electronic Data Interchange (EDI) has not yet found acceptance on a large scale. One reason for this may be seen in the fact that potential EDI users have not had much knowledge of EDI in practice. In order to provide them with relevant information an empirical research to survey different aspects of EDI was conducted.

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At the end of 1994 the 'Deutsche Telekom AG' (formerly the German public telecommunication operator 'Deutsche Bundespost Telekom') and the Institutes for Business Information Systems at three German universities prolonged their research project on EDI. The main objects of the project are to encourage the development and the use of EDI, especially UN/EDIFACT, to examine the suitability of networks, services, devices and protocols for EDI. The project has been denoted VULCAN which is the German abbreviation for 'virtual enterprises as a teaching, research and training network' [1]. The universities established training firms and the students are transferring simulated business data via EDI to virtual partners for further processing. The composition of these virtual companies is regarded as a lab for scientific research in the field of EDI. In the first phase of the project an empirical study was undertaken in cooperation with 'Siemens Nixdorf Informationssysteme AG' (SNI AG).

Empirical Study

The major objectives of this survey were the economic effects of EDI, the reasons for implementing EDI, the great variety of technical EDI variants and the speed of EDI diffusion. The investigation was based on the method of questionnaires circulated during the period from June to July 1994. Out of 100 German companies addressed 85 answered the questionnaire. This favorable response rate can be attributed to the fact that the employees in charge of the EDI system had been asked before to answer the questionnaire.

The EDI users interviewed were managers of medium and large-sized companies representing the industry sectors of manufacturing, trading, transportation and banks. The following article gives a brief description of the survey results. Most of the companies interviewed (70 %) introduced EDI during the past five years. The majority of the companies (88 %) are