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THE IMPACT OF ELECTRONIC COMMERCE INNOVATIONS ON MARKETING MANAGEMENT

by

Y. Yuan, N. Archer, and R. Bassett

Management of Innovation and New Technology
Research Centre
WORKING PAPER NO. 77

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The Impact of Electronic Commerce Innovations on Marketing Management[1]

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The Impact of Electronic Commerce Innovations on Marketing Management

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Abstract

The rapid growth of electronic commerce is profoundly redefining many basic aspects of business. The customer populations a company serves can be extended, restricted, and/or redefined through electronic commerce. E-commerce enhances the information content in existing company offerings, and enables the development of new information-intensive products and services. It supports shopper movement from physical space to cyberspace, and enables digital delivery of information products and services direct to the customer. It makes pricing more competitive and supports new forms of payments and pricing. E-commerce has also revolutionized promotion mechanisms, and fostered the elimination or adaptation of existing intermediaries as well as the development of intermediaries in entirely new forms. In this paper, the impact of e-commerce is analyzed, based on an extended market mix model with six Ps: People, Product, Place, Price, Promotion, and Partners. Three industry categories are investigated in detail: information service providers, information product providers, and physical product providers. These demonstrate the impact of e-commerce on a wide variety of products and services.

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1. INTRODUCTION

There have been many developments in history that have revolutionized the way we do business. For example, the advent of production lines in factories caused a major change from craft production to mass production in the early 1900s [1]. As a result, organizations had to rethink their activities to align with mass production concepts. A change of comparable impact is presently spreading through the business world. This change is the rapid growth of e-commerce (electronic commerce), due primarily to the growing access to the Internet and the systems it supports, such as e-mail and the World Wide Web (or just plain Web).

Many definitions have been proposed for e-commerce [2,3,4]. The most comprehensive yet concise definition appears to be "the use of information and digital communication techniques to network economic activities and processes in order to reduce information-related transaction costs or gain a strategic information advantage" [5]. This definition focuses on networks, economic processes, and outcomes. It avoids mentioning specific activities such as purchasing, specific actors such as customers or intermediaries, or specific organizational forms such as markets or firms. By avoiding these specifics, the definition is more generic than most others proposed, and is the definition we will use.

Historically, many digital technologies have been used for the exchange of electronic business information, including electronic data interchange (EDI), electronic funds transfer (EFT), bar codes, and inter-enterprise messaging. This information can be transmitted by various means: direct program to program, e-mail and fax. A subset of these technologies has been used for handling the transactions of e-commerce. The two main forms of e-commerce are EDI and Internet-based e-commerce. The latter consists largely of Web-based activities, supplemented by e-mail communications, and most current discussions of e-commerce are in the context of the Internet. Internet-driven e-commerce has begun to have a significant impact on the various ways of transacting business. In this paper, we will focus on one of the most profound aspects of business- the role of marketing. In preparation for this discussion, in the next section we discuss an extension of the classical four P marketing mix model to six Ps, a reflection of the influence of e-commerce on changes to the business environment. Then this extended marketing mix model is used to contrast the impact of e-commerce on three broad groupings of commercial activities: a) information service providers, including industries such as banking, insurance, and investments, b)

information product providers, which offer information intensive products such as software and Internet-based news media, and c) physical product providers, companies that distribute and sell tangible items. These categories were chosen because they include many industries, and they distinguish physical from information products, as well as services from products.

2. THE MARKETING MIX MODEL

Marketing is a vital business activity. A model commonly used to describe the various components of marketing is "the four Ps": Product, Place, Price, and Promotion [6]. Although this model covers a large portion of marketing activity, it lacks a measure of the focus on the players involved. Fillmore [7] suggests the inclusion of Partner as a fifth "P" in the model. This reflects the many changes that are easier to implement with e-commerce in helping firms to work with intermediary firms (or to bypass traditional intermediaries) to define and support the market, and in many cases to develop products for the market (outsourcing development and/or production). Finally, another very important "P" is the People who are the prospective customers. The demographics of customers in cyberspace is significantly different from customers served in traditional marketplaces. The characteristics of these customers and how they can be reached continues to evolve as more business-to-business and business-to-consumer transactions are enabled through e-commerce. In this paper, the marketing mix will refer to the combination of the "six Ps": People, Product, Promotion, Price, Place, and Partner.

People: prospective customers, either individuals or businesses

Product: a good, service, or idea to satisfy customer needs

Promotion: a means of communication between the seller and buyer

Price: what customers are charged for the product

Place: a means of getting the product into the customer's hands

Partner: an intermediary or outsourcing contractor

The impact of electronic commerce on these six Ps is summarized in Table 1 and is explained in detail in the following sections.

******* Insert Table 1 about here *********

2.1 People

The first step in market planning is to identify the people who are its prospective customers. Electronic commerce may extend, restrict, and/or redefine the customers a company can serve through electronic communication media. For instance, a bookstore opened in a small town may serve only local people. But a bookstore opened on the Internet may serve people worldwide. A local bookstore can serve a variety of people: young or old, rich or poor, women or men, but an Internet bookstore can only serve those who have Internet access; these people generally have higher than average income and education. Another consideration is the concept of market niches. As O'Reilly [8] points out, "The net isn't 30 million people, it's tens of thousands of overlapping groups ranging from a few people to perhaps a couple of hundred thousand at the largest." Understanding the consumer population in cyberspace and their shopping preferences is essential for success in e-commerce marketing.

The demographics of Internet and Web users continue to change rapidly. Today, 50% of American households and 30% of Canadian households have PCs at home. According to periodic Web user surveys conducted by the *Graphics, Visualization & Usability Center*[i1] at the Georgia Institute of Technology, the average age of users responding has recently been in the range of 35 years, with the proportion of females now at 40% and continuing to increase gradually. More than half of those aged 19-25 are involved in education (includes students). Those aged 26-50 are most likely to be employed in the computer technology field. The majority of respondents report that they primarily access the Web from home (64%). The most common Web activity was simply browsing (77%) followed by entertainment (64%), education (53%), and work (51%). Shopping continues to rise in importance, and is now in excess of 20%. The most commonly cited reason for using the Web for personal shopping was convenience (65%), followed by availability of vendor information (60%), lack of sales pressure (55%), and saving time (53%). The moderate and steady growth in personal shopping is a trend that is expected to continue as online transactions become easier and more choices of products and services become available.

The demand for goods and services varies substantially, depending on the population of Web users. The most popular items for which information is gathered, and which are purchased

[1] Superscript Roman numerals reference Web URLs (Uniform Resource Locator) in the end notes.

over the Web, are computer software and hardware. Other popular items include: travel arrangements (49% sought, 21% bought), books and magazines (43% sought, 19% bought), and musical tapes, CD's, and albums (37% sought, 14% bought). The amount of money spent by users through the Web is still very small. 36% of users reported spending less than $10 on purchases made through the Web in the past six months. About 20% reported spending between $10 and $99, and an additional 30% reported spending over $100. Overall, the trend is towards increased trust in Web-based transactions, although security concerns are a primary reason for not buying via the Web.

While consumer-to-business Internet commerce is still in its infancy, business-to-business Internet commerce is moving much more rapidly through the early adopter stage. Unlike the more traditional e-commerce tool of EDI, used primarily by large companies through private networks, the Internet makes electronic commerce affordable to small businesses and even home offices. Companies of all sizes can now communicate with each other electronically through the public Internet. Similar networks are used internally for company-use only (intranet) or by a company and its business partners (extranet). Forrester Research [9]estimates that U.S. business will buy and sell $327 billion worth of goods annually over the Internet by 2002. The growth of business-to-business electronic commerce is being driven by lower purchasing costs, reductions in inventories, lower cycle times, more efficient and effective customer service, lower sales and marketing costs and new sales opportunities [10].

2.2 Product

Major contributions of e-commerce to product change have been to enrich information content of existing products or services, the development of new products or services not previously feasible without low cost digital communications, and the application of mass customization.

The enrichment of information content of existing product or services is evident. For instance *Realtor.com*[ii], the largest & most popular real estate Web site, lists over 1.1 million new and resale homes. This site supports customized searches for homes in every U.S. city, provides mortgage information (searching for lending institutions), assists in finding realtors and compiling credit reports, and provides up-to-date real estate news.

There are many examples of new products or services not previously possible. For example, Internet banking allows customers to check account balances, transfer funds, make payments, and download transaction data for analysis on client machine software packages for personal financial management. *WorldJam*[iii] allows musicians to collaborate in writing musical compositions from remote sites. *Versions*[iv] can automatically transmit information in e-mail form whenever the developer of an acquired software product releases an upgrade. These products and countless others in such niche markets were not possible before the proliferation of e-commerce.

Another major product shift has been the swift movement towards mass customization. An example of this mass customization is Levi's *PersonalPair*[v] line of jeans. Customers can have their measurements taken at a number of stores throughout the U.S., resulting in recommendations for sizes and styles of jeans. The combinations of sizes and fits suggested through a Web site are much greater in number than any one store could reasonably stock. Once a selection is made, the information is electronically sent to the manufacturing facility in Tennessee, where the jeans are made. The customer receives the custom fit jeans in 2 to 3 weeks. The advantage to the customer is in knowing the jeans will fit when they are received. The advantage to Levi's is the dramatic decrease in inventory because the jeans are not manufactured until they are purchased. *Custom Revolutions, Inc.*[vi] is another example of customization which allows customers to create customized audio CD's from a large library of tens of thousands of songs, in many music genres. There are many other examples of mass customization through the Web, and these uses will continue to grow as e-commerce continues to expand.

2.3 Place

In the marketing mix, Place refers to the distribution of products or services. It includes both inbound and outbound logistics, as well as warehousing of goods. E-commerce has caused a shift from physical space to cyberspace for distribution of products such as information and software, and it has greatly facilitated the outsourcing and coordination of both inbound and outbound logistics. Historically, the initial main development in e-commerce was the application of EDI [11]. For example, bar-coding facilities at the cash registers of many stores, such as *Wal-Mart*, automatically update inventory levels. Once the inventory falls below a pre-determined

amount, an order is automatically and electronically sent to the supplier. All shipping information and subsequent invoicing is also supported electronically. EDI streamlines distribution by speeding up processes and minimizing errors. Attendant cost savings result from reduced inventories and paperwork, while at the same time service levels may improve, compared to other approaches.

Traditionally, people physically visit stores for shopping. With electronic commerce, it is possible to do the shopping in cyberspace through access to electronic shopping malls, Internet banking, etc. There are several issues that relate to the transition from physical space (e.g. department stores), to cyberspace (e.g. electronic shopping malls). These are summarized in Table 2.

******* Insert Table 2 about here *******

Although electronic shopping malls allow customers to shop at home, physical products still need to be delivered. Unless the customer picks up the goods, this normally requires outsourced services such as courier or parcel delivery, adding extra costs for shipping and handling. The quality of these related logistics services has improved due to e-commerce technologies. Shipping intermediaries such as *Federal Express*[vii] have improved service while reducing costs, by using Web sites to allow customers to arrange package pickup, track delivery status, and order merchandise on-line. However, for intangible goods and services such as software and information, the cost of electronic delivery is essentially zero.

The importance of Place in the marketing mix is emphasized by the cost of delivering products or services to the customer. According to Murphy [12], 20 percent of every consumer dollar goes to physical transportation of goods alone, or 15 percent of the U.S. national GNP. Many existing and startup businesses are experiencing rapid growth by developing expertise in helping companies cut these costs through electronic means. One such example is *i2 Technologies*[viii], which produces supply chain management software and solutions. This company has experienced rapid growth, and is on track for revenues well in excess of $200M in 1998, from its inception just 10 years earlier.

With e-commerce, supply chains for physical products have changed less drastically than for information products. E-commerce has influenced distribution of physical goods, often by making existing processes more efficient or effective. As an example, i2 Technologies designs object-oriented software and databases to handle the complexities of supply chain management. Their software solutions helped a division of *Bethlehem Steel*[ix] to improve its number of orders being processed on time by 15 percent. The division is now able to make more realistic delivery promises, thus improving its position in the competitive metals market. The point is that the physical delivery mechanisms did not change significantly. What did change was the underlying information infrastructure, supported by e-commerce tools.

Supply chains for information products are changing much more significantly than for tangible products. For instance, the banking industry is experiencing major changes in the way they deliver customer services. According to *Online Banking Report*[x], over 80 percent of the top 100 U.S. banks (by total assets) have Web sites. Of these top 100, 27 were considered true Internet banks offering a full range of online services. Clearly the means of delivering these services are changing considerably. Neither tellers nor in-branch staff are required, and their services are available 24 hours a day, seven days a week.

It is apparent that e-commerce is significantly influencing the distribution of goods and services. The impact of e-commerce depends upon the industry, as well as upon whether the product is information or a physical product.

2.4 Pricing

Pricing represents how much a customer is charged for products and services. E-commerce has made pricing more competitive due to the wide access to information afforded by related media, and it has also enabled new forms of pricing. There are three common pricing strategies [13], based on cost, value, or competition. Cost-based pricing simply applies a markup to the unit cost of an item. Value-based pricing reflects the valuation that customers place on a product. This valuation can be captured and analyzed through e-commerce tools such as EDI and analytical data mining tools. Competition-based pricing involves setting prices at the same levels as the industry leaders.

Lower pricing through cost leadership is a generic competitive strategy discussed by Porter [14]. In general, e-commerce can support this strategy because it can help to lower transaction costs as well as to more easily obtain information on competitors and customers. However, electronic commerce also gives customers the ability to shop around electronically in order to find the best deal. Intelligent agents can even do automatic searching for customers, based on their individual needs. Customers also expect more free information and free services, which puts more pressure on companies to pursue a cost leadership strategy.

At least three new pricing models have been made feasible in consumer markets through electronic commerce. These include on-line auctions, customer price setting, and micro-payments. There are many on-line auction sites on the Web (e.g. *Auction Warehouse*[xi], *Web Auction*[xii], *ebay*[xiii], etc.), offering auctions for computer hardware and software, antiques, collectibles, vacation packages, etc. These auctions normally work by advertising specific items with closing auction dates. Bidders can bid on any item, but they are notified by e-mail if other, higher, bids are made. The highest bid at the close of the auction wins.

Recently, *Priceline*[xiv] has introduced a new way to sell airline tickets, based on prices specified by customers though the Web. This is not an auction, because there is no bidding after the initial offer. Consumers simply name their price and let Priceline find a seller. Since airlines collectively have flights which fly with over 500,000 empty seats every day, selling an empty seat at lower than the regular price can be a win-win situation for both the traveler and the airline.

Micro-payment is the facilitation of small payments (under ten dollars), such as paying for a piece of information, or playing a game on the Web. These amounts are too small to be handled efficiently by credit cards or other payment methods. "Digital Cash" is the milli-cent concept being promoted by *Digital Equipment Corp.* [15]. This concept allows "micro transactions" for amounts that are sometimes less than one cent. A broker acts as an intermediary between buyers and sellers. Customers may take a long time to conduct enough micro-transactions with any single supplier to cover the cost of processing a single transaction. However, a customer may spend enough on purchases from a number of different suppliers to cover such transaction costs. Therefore, the broker would consolidate small sums from any customer and in turn hold the rights to collect funds on behalf of the suppliers.

It is not clear how e-commerce will affect price differentiation activities. It may make it more difficult to charge a different price to different customers for the same product, when customers have easy access to information. But it will be feasible to charge different prices based on differently customized products such as personal computers.

A major influence of e-commerce on pricing involves the speed at which information can spread throughout the marketplace. In a competitive market, the equilibrium price of a good or service at any moment is such that available supply is equated with aggregate demand. As new information becomes available the market reviews and interprets it, resulting in a possible change in the equilibrium price. Market prices that adjust more rapidly and accurately to information are considered more efficient. Efficient market theory is commonly discussed with respect to capital markets. Although there are debates as to the degree of efficiency of these markets, the existence of insider trading profits and the strong stock market regulations imposed by governments suggest that existing capital markets are less than perfectly efficient. There is a greater wealth of information now more readily available to both buyers and sellers through the Web, and the speed by which necessary information reaches buyers and sellers has increased. The resulting prices more quickly reflect available knowledge, and the market becomes more efficient.

Two caveats should be noted concerning market efficiency. First, the wealth of information is only as good as the mechanisms used to extract it. Internet search engines, directories, and intelligent agents help in this search process. Second, automation of the capital markets currently only involves the electronic support of order routing as well as the clearing and settlement phases of the exchange process. The price discovery process lags these other market automation tools [16]. Thus, e-commerce tools of today do not directly dictate market efficiency levels, but indirectly influence it by allowing faster dissemination of information and ready access to securities transactions through the wide availability of financial brokers on the Web, such as *The Investor's SuperSite On The Web*[xv]. This site provides real-time stock and mutual fund information for investors from a number of stock exchanges, including analysis by industry group.

The Internet can be considered a new trade route similar to the Silk Roads of China (circa 2nd century B.C.) [17]. In those days, the process by which money was developed to replace bartering of goods is similar to the process of electronic money now being developed to replace real money. The Silk Roads also forced participants to adapt laws and taxation to reflect the

international transportation of goods. The nation of residency is currently a major determinant of which tax rules should apply to individuals or companies. Problems such as choosing a "flag-of-convenience" to avoid taxes is potentially an explosive issue for the Internet community. It is much easier for a company to establish a Web site in a more tax-beneficial country than it is to set up physical operations there. Capturing transaction details at national borders in order to tax intangible goods such as information and software is a major challenge for government regulators, who will no doubt devise new taxation schemes to tap Internet markets, as the volume of such business transactions becomes significant. As a consequence, the net price paid for these goods will increase, so a new field of Internet tax planning and management will develop. Currently, most industrialized countries have a moratorium on such taxation until more is known about implementing it technically and fairly.

2.5 Promotion

Electronic commerce has changed traditional promotional methods significantly, including advertising, personal selling, sales promotion and public relations activities [12]. It encourages and facilitates customer-initiated information search, attracts customer attention by providing free information services, provides extensive and tailored product and service information, and enables the development of virtual communities. Overall, the element of promotion most affected by e-commerce is advertising. The impact and value of using the Web as an advertising tool have been investigated elsewhere [18,19,20]. Palmer and Griffith [21] describe several strategies for selling and market support on the Web: a) for high product information intensities (such as computers and insurance), selling and marketing support can capitalize on all the capabilities of the Web for promoting, selling, and supporting/servicing products and services, and b) for low product information intensities (such as beverages and fuels), Web functions can either support existing market channels or can simply provide a company presence, which will be unlikely to generate additional sales.

Web technology allows companies to provide easily accessible information in multi-media form. Unlike traditional obtrusive “push” techniques such as TV commercials and junk mail, companies can choose “pull” or “push” techniques to provide information.

Pull techniques include those approaches that observe users searching for content on Web search engines or directories, giving the advertising system clues to the user's interests. Based on hypermedia technology, Web browsers allow customers to obtain product information to the level of detail of a picture, a brief description, a software demo, or downloaded documents such as user manuals or technical reports. Web search engines or directories [22] such as Yahoo are high traffic sites which attract advertisers. When a user searches for information at these sites, advertising logos and links to product sites are displayed automatically, based on key words entered by the user in conducting an information search.

Push techniques are used by services which gather interest profiles from users when they register for the services. These include services such as Microsoft *Hot-Mail*[xvi], which provides free e-mail delivery. Another example is *PointCast*[xvii], which provides software to support its service on user computers, and includes a free subscription to its electronic magazine. Based on the user's profile, the system automatically downloads updated Web information for display when the computer is otherwise idle. Marimba's *Castanet*[xviii] acts like a TV, with many channels. Customers choose the "channel" they wish to receive. In these "free" services, downloaded information is accompanied by advertising that is tailored to user profiles.

In contrast to traditional temporary sales promotions, e-commerce suppliers commonly offer "everyday low prices" for on-line shopping. There are effective ways to promote products interactively on the Web to potential customers who are just browsing. For example, *Modernbride*[xix] provides tips for wedding plans. Based on user plans such as taking wedding photos, this Web site provides recommendations for taking good photos, and company Web sites that offer wedding photo services. *1-800-Flowers*[xx] recommends flowers based on occasion, product category, and price range. Once an order is entered, flowers are delivered the same day. *GAP*[xxi] provides for virtual styles on its Web site. A customer can create his or her own clothing outfits by displaying different combinations of colours and patterns. *Amazon Books*[xxii] provides search facilities for books from its collection of titles, and information about authors, tables of contents, and reader comments. It also recommends books on related subjects. *FreeShop*[xxiii] provides a variety of free trials of different products ranging from software, magazines, catalogs to financial services. Information goods are promoted by providing music samples to be played or free trial software to be downloaded.

Personal selling is an important component of promotion, and the loss of personal relationships between seller and client when moving to e-commerce technology can result in the loss of customers. This may more than offset any efficiencies due to introducing the technology. Maintaining the personal touch while introducing e-commerce can pay off in the development of personal, long-standing relationships with clients. One common approach is to send personal e-mail or to telephone potential customers who have downloaded trial versions of software, or who have visited Web sites and requested more detailed information on products or services. Another technique is to provide a live chat service as with *E*Trade Securities*[xxx], to facilitate communications between customers and sales representatives. A new approach, which is likely to enhance this style in the future, is the use of Internet phone or visual phone. Another tool which facilitates communication between sales people and customers is the use of a notebook computer to display information from local or remote company databases, or to develop on-the-spot quotes for products such as insurance or mortgages.

Public relations activities are conducted by a company to portray a desired image to the consumer. E-commerce technology can be used improve public relations by offering e-mail, user newsgroups, or Web sites to customers or potential customers. These are much more information-rich and cost effective than traditional approaches. For example, company profiles, annual reports, and other promotional information, in conjunction with problem solving services, can be used to enhance a company's public profile.

In the physical world, the idea of communities is a common and welcome concept. People feel comfortable among others with similar interests or professional affiliations. Recently, more attention has been paid to the value of "virtual communities" [23]. The key behind a community is a bond or relationship among its constituents, which can only be fostered if there is a means for the parties to interact. Increasingly, Web sites support visitor interactions through newsgroups and chat lines. The development of any community depends on a common focus or interest. For example, *GardenWeb*[xxiv] allows visitors to interact through a variety of forums related to gardening. Another example is the QB1 football game on the television network *TSN*[xxv] Web site. QB1 allows participants to compete against one another by predicting the next play of a live game being played on TSN. These sites also offer free information related to the focal topic. The main promotional advantages of virtual communities are that users tend to return if they are interested

in the topic, and the site's focus helps to target advertising efforts. As the commercial advantages of online communities become more evident, more of these Web sites will appear.

2.6 Partners

Partnering reflects the growing trend of companies to outsource activities, especially those that are not a part of the core competencies of a company. This concept includes intermediaries who may support any of the components of the supply chain, and coordination of partners is typically through "virtual" communication links. There is a current debate on whether the onset of e-commerce will lead to the demise of intermediaries, will change their activities very little, or will expand or change their functions significantly. The following characteristics of intermediaries in retailing are taken from Mougayar [24]:

1. Manage a high concentration of information not available elsewhere
2. Facilitate virtual services being chained together
3. Facilitate financial transaction completion
4. Use the Internet for both the delivery and marketing medium
5. Help obtain a critical mass of buyers or customers

Transaction cost theory has been used to argue against the need for intermediation [5]. These authors use a hypothetical case to show transaction cost savings when particular players are removed from the value-added chain. At first glance, the savings from eliminating intermediaries are substantial. The problem with this analysis stems from its stringent assumptions. The main limiting assumption is that market choice will serve as the interface between the consumer and the organization, and will provide interactive capabilities necessary to exercise free market choice in an easy and intuitive way. However, with the wealth of information available on the Web, it is difficult for the customer to make "free market choice in an easy and intuitive way" without the aid of an intermediary. The additional costs incurred by the supplier in bypassing intermediaries, due to the need for sales force increases, high volume transaction processing, and major changes in outgoing logistics, as well as the danger of fragmenting existing parallel marketing channels, are important considerations in such a comparison.

Transaction cost theory has also been used to show that, when direct marketing is too expensive, "cybermediaries" will thrive [25]. Here, cybermediary is a term describing intermediaries that exist on the Web. These include a variety of support techniques, ranging from on-line search engines and intelligent agents to Web-based insurance brokers.

An example of an intermediary is *Microsoft CarPoint*[xxvi], which combines up-to-date information on more than 900 major car models sold in the United States. This enables users to search among the models, based on criteria the user selects. Currently, more than 1,000 purchase requests are placed daily through the new car buying service on CarPoint. These generate about $200 million in vehicle sales each month. Dealers participate in the service because CarPoint customers know exactly what they want to buy, and demand a streamlined purchase process. This reduces dealer sales costs and lowers buyer prices.

Cebra is a cybermediary which has teamed up with the Insurance Brokers of Ontario to provide consumers with *InsureXplorer*[xxvii], a fast and efficient way to receive competitive pricing on auto insurance. Over 300 brokers are represented, from more than 25 insurance companies, offering consumers a wide range of choice and value. *Priceline*[xiii] is another cybermediary that sells empty seats for many airlines, as described earlier in this paper.

A major point is that these new forms of intermediaries have appeared and thrived in the world of e-commerce, indicating that transaction costs are not the only consideration for such services. It is very clear that customer and supplier perceptions of value and service also play important roles. Overall, the role of intermediaries in e-commerce is evolving. Some traditional intermediaries, which offer services that would be easy for e-commerce customers to handle by themselves, are threatened and must reduce their costs and introduce new customer services to survive. For example, direct personal services such as travel agent bookings for airline flights, or agents for buying and selling equities and bonds are threatened. Current evidence indicates that intermediaries will continue to thrive, but in many new and adapted forms.

3. THE SIX P MODEL FOR SPECIFIC BUSINESS CATEGORIES

The Six P model can be a useful tool in analyzing and contrasting the general impact that electronic commerce is having on firms in different industries. To demonstrate this impact, in the

following sections we look at three broad categories of companies, which support markets that differ significantly in their market characteristics: a) information service providers, including industries such as banking, insurance, and investments, b) information product providers, which offer information intensive products such as software and Internet-based news media, and c) physical product providers, companies that distribute and sell tangible items, These categories are inclusive enough to cover many industries, and they distinguish between physical and information products, as well as between services and products.

3.1 Information Service Providers

Information service products are offered in the financial, insurance, and investment business. Over the past few years, financial institutions have begun to look at new ways to increase profits. In the past, they were chiefly concerned with asset quality and capitalization [4]. As long as the institution was performing well in these areas it could likely remain profitable, but focusing on asset management and capitalization is no longer sufficient in the world of e-commerce.

E-commerce has had an obvious impact on the banking industry. Bank intermediation activities have intensified in response to the need for faster dissemination of increasing volumes of financial information. Banks have responded to these challenges by developing and marketing new on-line financial tools and services for making transactions and analyzing monetary information. E-commerce has also allowed new players such as cyberbanks to enter the marketplace, where traditionally banking was not an easy industry to enter, especially in countries that place few limitations on bank growth. Overall, banking e-commerce activities have not conferred long term competitive advantage, because many of these applications are easily imitated by competitors. Banks have a history of being early adopters of new information technologies. Their innovations have been well-received, due to the resulting increased customer convenience.

The arrival of e-commerce technology such as automated teller machines (ATMs), debit card shopping, on-line banking, and digital cash, has revolutionized banking and changed the competitive environment. Financial institutions were interested in turning the home banking concept into reality as early as 1970 [4]. Many articles on innovation have discussed the

acceptance of new banking technologies [26,27,28]. In conjunction with knowledge about demographics, banks can improve their marketing by more effective bundling of services.

The introduction of EFT (Electronic Funds Transfer) and debit cards brings banking directly into stores. Since banking essentially involves the transfer of information (account information and transactions), transactions and information exchange can be handled more effectively by electronic means, resulting in a decreasing need for physical bank branches. Physical branches may be desirable for customers who prefer the personal touch, and they have been felt by the established banking community to be necessary for image. Physical structures of main bank branches exude an air of security and stability, important characteristics of a bank. However, some newer banks ("cyberbanks") have been formed to operate entirely over the Web. Having no physical branches, they do not have this perception of security and stability, but they threaten the supremacy of traditional banks. Cyberbanks can operate at lower cost since they do not need to invest large amounts in property and in localized personal support services. At the present time, this type of bank is unable to deliver physical evidence of transactions such as money orders and foreign currency directly, but the need for such instruments will become less in the future as more currency transactions move on-line.

VanCity[xxviii], a credit union in Vancouver, is the largest credit union in Canada. Through its Direct™ PC service, its members can transfer funds between accounts, pay bills and apply for loans. *Wells Fargo Bank*[xxix] allows customers to use the Internet to view account balances and history, and transfer funds between accounts. Through the Wells Fargo bill payment service, consumers can set up automatic payment of recurring, fixed amount bills such as mortgages, make one time payments of varying amounts, and send money to any individual anywhere in the U.S.A. Forrester Research [9] projects that the number of U.S. on-line banking households will grow to more than nine million in 2001, a sizable group of customers for these new banking approaches.

The insurance industry is also embracing e-commerce as a means of enhancing their product offerings. For instance, many dental offices and pharmacies electronically file patient claims to group benefit plans through EDI, resulting in fewer errors as well as more rapid payments. Brokerage affiliations such as *Cebra*[xxvii] (discussed previously) offer consumers the ability to receive quotes over the Web.

In the investment business, Web sites maintained by *E*Trade Securities*[xxx] and *Charles Schwab*[xxxi], for example, provide individual investors with access to stock, bond, and mutual fund trading, at prices similar to those charged by discount brokers. Such sites have much potential for additional investment services. For example, the Schwab site has the ability to download information into a spreadsheet, with cash management and tax applications as well as being able to analyze and compare the performance of investments.

3.2 Information Product Providers

It is natural and convenient for customers to search for and to receive information products electronically. Already there has been a significant shift from traditional methods to e-commerce for selling information products. Since customer feedback is much easier to collect, market testing for new products is faster and more efficient. The electronic exchange and sale of information includes software, and published articles such as those found in on-line newspapers, magazines and journals. These items are often sold at retail, but they have special characteristics. Some of the key issues that have been debated include improving and enforcing copyright protection, how to use technology effectively to create compelling content, and how to conduct financial transactions for individual articles [4].

Published articles and information pieces also have many characteristics that differ from physical counterparts. First, the cost of reproduction is minimal. Second, the value of information is not lost when it is sold because the contents are not limited by their medium of expression [24]. Because reproduction and dissemination of information products is very simple and almost cost-free, copyright protection is an important issue for copyright owners.

Personalization of information products through e-commerce is a form of mass customization [29]. It would be exceedingly difficult and costly for a newspaper to distribute 75 individual sheets with different stories, to allow consumers to purchase exactly what they want. Publishing on the Web makes such a publishing model economically feasible.

Bundling is a marketing issue which is particularly important for information product sales. This refers to the grouping of products or services into a single customer offering. An example is the free clock or brief case that some publishers offer for subscribing to their magazine or newspaper. Two key issues arise with respect to bundling information products: the content of

the bundles, and their price. Information goods could be bundled together because of technological complementarities in their production, consumption, search, or distribution. It is often desirable to bundle such goods simply to take advantage of bundling as a price strategy, and Bakos and Brynjolfsson [30] found that marginal costs can impact bundling decisions. They also found that products with zero marginal costs are better suited for bundling, because the probability that the consumer will value any of the components of the bundle at less than their marginal cost is reduced if the individual marginal costs are low. Since marginal costs of information products are often quite low, this indicates that bundling information products is a favourable strategy. Empirical evidence tends to support this notion: many on-line stores sell physical products individually, but information providers such as America Online follow a bundling strategy.

The Web provides an opportunity for new forms of information products, but one of its most important contributions is the delivery of information products. For example, many television and radio networks operate Web sites which deliver news and other information in a variety of formats (video, audio, and text or graphics), at little cost to the producers since they simply mimic the form being delivered on the primary media. Major newspapers and magazines, as well as a number of journals, also have Web sites which deliver information, for the most part duplicated from the original forms. Many of these products are free but, of course, they are accompanied by advertising directed to the population sector likely to be viewing the information. Others require payment by subscription, although the availability of micro-payment systems will attract paying occasional customers.

Computer software is increasingly sold through the Web, an ideal distribution channel for this information product. Not only can software be advertised through a Web site at low cost, but detailed technical information can be made available for potential customers. In many cases, customers are able to download evaluation copies for inspection for a limited time. Software purchasing on the Web ignores international boundaries, and requires no movement of physical goods since the software, documentation, and support services, as well as the payment itself are all on-line. Clearly, taxation issues for software acquisition do not have an easy resolution since Internet traffic is not currently monitored by government agencies for such transactions.

3.3 Physical Product Providers

Most of the e-commerce traffic in physical goods to date has been business-to-business. A critical mass in consumer sales is forming slowly, due partially to the lower rate of Internet access in homes, and the fact that shopping habits change slowly over time. The younger generation of users, who are more likely to access the Internet as part of their daily routines, will find it easy to adapt to electronically enabled shopping. They will use the Internet for information gathering in a wide variety of applications, as well as for purchasing goods and services.

The sale and distribution of physical goods is the traditional realm of the retail industry, which is experiencing many changes due to e-commerce. However, a main lesson that is still valid is that it is necessary to personalize the content of consumer offerings, also known as one-to-one marketing [31]. Examples of this level of customization already discussed include *Levi's Personal Pair*[v] system, as well as the personalized audio CDs offered by *Custom Revolutions*[vi].

Intelligent agents that gather information from Web sites (e.g. for Web search engines and Web directories) can have a significant impact on the marketing mix of physical goods providers, since they may determine the distribution channels that customers choose. Suppliers must be aware of this effect and, if necessary, strategically design their distribution channels to attract electronic agents. The increasing use of push techniques is also forcing suppliers to re-think how to attract customers.

Recent developments in virtual reality have allowed the design of virtual storefronts. With this type of tool, companies can conduct test marketing for new product ideas much cheaper and faster than previously possible. Test marketing a product in the physical marketplace can take six months to a year or longer and can cost millions of dollars [32]. A virtual storefront is just a simulation of an actual retail store on a computer screen. The marketer can quickly change screen displays, at low cost, to test for different product layouts. Product simulations are very flexible, allowing fast transitions between different marketing concepts. Virtual storefronts can also be used to test user interfaces developed for e-commerce applications.

As with information products, intermediation is taking on changing roles with physical products. Traditionally, wholesalers and distributors have been important links between manufacturers and customers. Intermediation usually involves the pooling of goods or services from suppliers at a location where customers can make their selections. In e-commerce retailing

Palmer [33] compared four different electronic product catalogues (EPCs) used over the Web. In addition to offering product information and an opportunity to purchase products, each of these sites also offered secure payment options, extensive customer service, substantial information on the various product offerings, and rapid delivery times. Although there were variations among the four sites, this demonstrates how EPCs can enhance retailing of physical products on the Web.

The increasing focus on mass customization is affecting product offerings, EDI is helping to decrease unit costs of production and distribution, and advertising opportunities are widening with the availability of the Web as a graphical advertising medium.

New marketing paradigms are evolving for marketing physical products. For example, there are experiments with various push and pull techniques to capture customer attention. Intermediaries are finding that they have to extend the services they offer to both suppliers and customers in order to differentiate themselves from competitors. The competitive environment is also changing. Barriers to entry are generally low, so the traditional advantages of large companies over smaller competitors are not as clear. The new electronic tools also allow companies to conduct competitive analysis of both shoppers and purchasers at lower costs than those associated with traditional retailing studies.

4. DISCUSSION

E-commerce is affecting marketing in many industries, and in many different ways. The Six P model provides a framework for analyzing and comparing these effects. We have used the framework to examine the impacts on producers in information services, physical products, and information products. An understanding of these impacts can help in planning the future environment for companies interested in utilizing e-commerce technologies.

There are three main observations relevant to the people component of the e-commerce market model. First, the potential for niche markets is now very substantial due to the wide reach of the Internet to a larger population base. Second, the potential for customization of products and services is supported by e-commerce technology. Third, the rapidly changing global demographics of populations with access to e-commerce requires a careful analysis before investment in electronic commerce markets. The potential of e-commerce can be assessed, for

example, with inexpensive initial investments in promotional activities on Web and e-mail for monitoring and survey purposes. Many companies are moving into e-commerce markets in this way before committing to on-line sales and service, which may involve major investments in on-line transaction processing, staffing with sales and distribution personnel, and major changes to other aspects of supply chain management.

New forms of information products and services will continue to become available through e-commerce, and the information content of physical product marketing will continue to grow to support marketing, sales, distribution, and after-sales service. One of the major effects of e-commerce has been the development of mass customization. This will continue to evolve as the Web becomes more ubiquitous and transmission capacities grow to provide better support for video and, eventually, virtual reality. A side effect of the ease with which information products can be duplicated and distributed is the issue of copyright, particularly the difficulty of detecting and preventing copyright violations.

Distribution channels (place) have been streamlined for all three categories we discussed, but in varying degrees. The main change in physical product distribution has been in cost reduction and service improvement, but information services and products are now being linked more directly from producer to customer. Major changes have occurred in the distribution of information products, often in new forms and bundled in new ways, and carried out entirely as virtual transactions. The distribution network now covers the global market rather than a local or national market, and supplying products or services to this global market is causing profound changes to the marketing focus of firms of all sizes.

E-commerce affects the pricing of information and physical products more than information services because the unit cost of production and distribution of the former is more directly affected by e-commerce. Information products supplied via e-commerce are often simply different forms of existing media, distributed at minimal cost to the provider, although disruption of existing distribution channels can occur and must be understood in the context of existing distribution agreements. There are many evolving price issues, particularly in payments and taxation. Solutions are available, particularly in micro-payments, and as standards are implemented new markets will open in the information products area. Few solutions have been

proposed as yet in the taxation of information products and services, which can cross international and state/province boundaries unobserved through e-commerce communication networks.

Promotion activities have experienced many changes due to e-commerce. For example, with information service providers such as banks, portraying an image of security and stability is very important. Thus, although competitive pressures have pushed the banks to move many of their operations to the virtual environment, public relations will likely dictate a balance between the virtual and physical worlds. Physical product providers must also balance the virtual world of e-commerce marketing and sales with the physical world of place, supported heavily by e-commerce. Conversely, information product providers can more ably sustain a pure virtual existence. This has been reflected in the success of many new virtual companies, and the development of new e-commerce offerings that duplicate existing physical products, particularly by media companies.

Serious dislocations have occurred and will continue to occur to the intermediary partners that traditionally supported the business sectors discussed in this paper. Most of these partners will be forced to either adapt or disappear. Although the impact on retail store intermediaries has not been very great as yet, as Internet access for consumers grows and new forms of information on products become available to support on-line shopping, major changes will be forced on retailing. Other intermediaries which support e-commerce transactions, such as banking and credit card firms, have evolved from previous more traditional operations, and courier services have improved service and cut costs through e-commerce support. At the same time, entirely new intermediaries, such as Web directories, search engines, and auctions, have been formed to provide additional low-cost services to customers.

This analysis has not been exhaustive. Particular industries such as utilities, health care and education could have been analyzed. The intent of this study was not to give a comprehensive coverage of particular industries or products, but rather to select a few broad categories to demonstrate that marketing has both distinct and common attributes in the world of e-commerce.

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Marketing Mix Element	Effects of E-commerce
People	• Restrict, extend, and redefine prospective customers • Demographic identification of market niches • Enrich information gathering to identify customer preferences and buying behaviour • Encourage higher expectations of wider selection, lower prices, better service • Change perceptions and trust of virtual / physical institutions
Product	• Enrich information content of existing products or services • Enable new forms of information products and services • Enable mass customization of products and services • Increased attention to copyright protection issues
Place	• Movement from physical space to virtual cyberspace • On-line delivery of information goods and services • Support outsourcing, electronic coordination of in- and outbound logistics • Promote globalization of the marketplace
Price	• New forms of pricing and payment methods • Development of more efficient markets, more competitive prices • Raise new taxation issues
Promotion	• Enable new options for push and pull technologies • Encourage, facilitate customer initiated information search • Attract customer attention with free information services • Extensive and tailored product and service information • Development of virtual communities • Flexible promotion strategies easily implemented
Partners	• Eliminate or adapt existing intermediaries • Create new digital intermediaries, including web-based search-engines, directories, auctions • Coordinate partners via virtual links • Search engines, directories support customer shopping

Table 1 The Six P Model and Its Main Effects.

Shopping Characteristic	Advantages Of E-Commerce Applications	Disadvantages Of E-Commerce Applications
• Accessibility	• Reduces travel • Eliminates geographical boundaries • Anyone, anywhere, anytime	• Limited to customers with Internet access
• Richness of product information	• More detailed, searchable data • Free trial, download software packages • Multi-media, virtual reality for more realistic evaluations • Third party comments	• Can't touch, feel, smell, try out physical items • Lack of usual physical leisure environments
• Personal touch	• More personalized services	• Direct contact with sales people difficult, unable to establish direct personal relationships
• Security and privacy	• Simple to handle payments • Improved third party security services available	• Concerns about payment security • Awkward to handle very small or very large payments

Table 2 Advantages and disadvantages of e-commerce shopping.

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