Electronic Commerce Viability by Industry Group

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ELECTRONIC COMMERCE
VIABILITY BY INDUSTRY GROUP

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I. INTRODUCTION

Use of the internet is growing at a phenomenal rate. For instance, it took 38 years for radio to reach 50 million users, but it just took 5 years for the internet to do the same (Press, et. al, 1998). Currently, the fastest-growing use of the internet is shopping online (Donthu and Garcia, 1999). Electronic Commerce (EC) is defined as "any transaction completed over a computer-mediated network that involves the transfer of ownership or rights to use goods or services" (Parker and Grove, 2000). By 2001, EC is expected to exceed $70 billion in Europe alone (Micossi, 1998). Of the households with personal computers, 1 in 10 has made an online purchase (ZDNet, 1998). More recently, Bayan indicated that 57% of North American internet users (approximately 45 million potential customers) have shopped online. These internet users spent an average of $460 each year on online purchases (Bayan, 2000). On the other hand, Uchitelle (2000) suggests that EC transactions between organizations will far exceed consumer EC transactions. Uchitelle (2000) reports that EC transactions between organizations totaled $90 billion in 1999, as opposed to $16.7 billion for consumer EC transactions. Acceptance of the security and usability of electronic funds is low but growing (Komp and Walstrom, 1998). Both of these infrastructures, (the net itself and an acceptable payment mechanism) are necessary precedents to a vibrant world of Electronic Commerce (Evans 1999).

Electronic Commerce is changing the value chain from manufacturers to retailers to consumers by altering the way people communicate (Donthu and Garcia, 1999). While it is clear that EC will change the face of buying and selling products, what is not clear is who will be the big winners and losers. As Parker and Grove (2000) note, "The growth, integration, and sophistication of information technology and communications are changing our society and economy. Although the expanding use of computers and other electronic tools is widely acknowledged, their effects are largely undefined and, therefore, hidden or poorly measured in official economic statistics." While it is clear that EC will change the face of buying and selling products (Gogan, 1996-1997), what is not clear is who will be the big winners and
losers. The strategic use of EC techniques may well change the basis of competition in many industries. Although it is impossible to accurately see the future, this article presents a basic framework for evaluating the use of EC in different industries. The framework could also be used by individual organizations as a decision tool to evaluate the potential benefits of entering the EC world. Wouldn't it be wonderful if we had a nice accurate crystal ball that would show us the future? Then we could see all of the ways in which EC has reshaped the competitive business world. There is no crystal ball, but what is offered here is an attempt to reveal some portion of what might be shown by such a marvel.

Many technological innovations have come along to change the landscape of the business world. Frequently they were not perceived as having much potential impact. For instance, many observers thought that the telephone would not greatly influence business practices. As President Hayes said, "Business people will always want to have face-to-face contact."

Gogan (1996-1997) suggests that marketing and sales techniques change in response to technological advances. They present a summary of these changes based on past technology along with an early examination of the influence of the World Wide Web on marketing and sales techniques. DePrince and Ford (1999) in highlighting obvious distinction between the goods sector and the services sector, point out that the subsectors of specific goods and services require individual attention. These prior works represent a call for the current paper's research into industry-specific EC impact.

This project is designed to assist in the analysis of industry segments and product types that can be expected to have the greatest EC potential. Based on that, it should be possible to identify those industries that can expect the greatest amount of change as a result of the growth of electronic trading.

II. PAPER ORGANIZATION

This study has the following organization: The preceding section has been a motivation and problem statement reviewing the previous pertinent literature. The next section gives an overall view of the model of industry characteristics. Next, the specific model factors are discussed in detail. Then, an illustrative example of one product is presented using the model. Finally, conclusions are given.

III. MODEL OF INDUSTRY CHARACTERISTICS

The table below identifies industry characteristics that would lend them to greater or lesser use of EC. While the industry model is an original idea and presented here for
the first time, the formulation has been influenced by prior literature (e.g., Gogan 1996-97, DePrince. et. al, 1999), as previously noted.

Factors affecting the impact of Electronic Commerce
1. Consumer acceptance of "sight unseen" purchasing
2. Traditional reliance on personal selling
3. Penetration of IT into industry
4. Tangible or Intangible Product
5. Shipping Constraints
6. Product Presentation
7. Channel Characteristics
8. Information content
9. Fungible Product

SIC Industry Groups

<table>
<thead>
<tr>
<th>Industry Group</th>
<th>Agriculture, forestry and fishing</th>
<th>Mining</th>
<th>Construction</th>
<th>Manufacturing</th>
<th>Transportation, Communication, Electric, Gas</th>
<th>Wholesale Trade</th>
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Figure 1. Industry Characteristics affecting Electronic Commerce

The nature of the factor and its' potential influence on the segment of industry is marked by plus (+), minus (-), or question mark (?). A plus mark indicates the factor improves the likelihood of EC impact. A minus mark indicates that the factor reduces the likelihood of EC impact. A question mark (and there are, indeed, many question marks in this sort of speculation) indicates uncertainty about the impact of this factor. Both a plus and a minus (+ -) indicates that further breakdown is necessary as this industry classification may include members on either side of the question. This model is offered to assist in the analysis of potential industry impact of electronic commerce on products, channels, and competitive structure.
Industry groups presented here are those taken from the U. S. Government Standard Industry Classification (SIC) system (OMB, 1987). Nine industry factors have been identified that should contribute to the applicability of Electronic commerce:

1. CONSUMER ACCEPTANCE OF "SIGHT UNSEEN" PURCHASING.

The willingness of the consumer to purchase products without actually seeing them is very important to the success of EC. Undoubtedly, there will be products that do not currently possess this characteristic (Singh 1999) that may well develop it, but products that are currently acceptable sight-unseen are better EC candidates. For example, consumers seem to be quite willing to purchase books without seeing them. Fashion items might be a much different story. What is it about a book that so readily lends it to this form of marketing? In some sense, a given title is like a commodity. Most consumers care little about where the purchase is made. While the browsing experience may lend to the likelihood of a sale, this may well be easier to accomplish online than it is in the bookstore.

2. TRADITIONAL RELIANCE ON PERSONAL SELLING.

Some types of products have traditionally relied on personal selling. Unless this characteristic can be circumvented, such products do not have good prospects for EC applications. Insurance is an example where personal selling has always been a big factor. The consumer may need the close consultation of the agent to determine the exact product required.

However, a number of strategies have been proposed to help overcome this reliance. Although these strategies are focused on individual companies and products, the existence of such strategies suggests an attempt to overcome reliance on personal selling. Bayan (2000) notes that a focus on customer service and customized interaction (i.e. the ability to customize the web site) helps convince e-commerce shoppers to return to the site repeatedly. However, forcing customers to contact a company representative to complete a transaction drives users away (Bayan, 2000). Gogan (1996-1997) notes that increasing costs for face-to-face selling in the 1980s led many companies to adopt telemarketing strategies to reduce costs. EC can be viewed as an extension of this movement.

3. PENETRATION OF IT INTO INDUSTRY.

Highly developed use of Information Technology will facilitate the advance of the industry into Electronic Commerce. The financial industry has had a long history of reliance on information technology. While some information technology is in use, agriculture is not nearly so heavy of a user. This will undoubtedly be a shorter-term
phenomenon as more and more industries find an appropriate role for information technology.

In fact, the growth of information technology has already had an amazing impact on many industries and organizations. During the 1980s, the use of EDI, telemarketing, electronic publishing of specialty catalogs (either in print or electronic format), and targeted advertising (accomplished by databases of customers) grew dramatically (Gogan, 1996-1997). The influence of technology on commerce increased dramatically in 1993 when the National Science Foundation changed the Acceptable Use Policy for the internet to permit commercial activity. Between January of 1994 and January of 1996, the number of hosts on the internet tripled and over 50,000 companies reported conducting commercial activities on the internet (Gogan, 1996-1997). This trend toward EC appears to continue today.

4. TANGIBLE OR INTANGIBLE PRODUCT.

Industries that have an intangible product are generally good candidates for EC applications because the product (at least in part) may well be deliverable over the network (DePrince et al 1999).

5. SHIPPING CONSTRAINTS.

Some products are not readily shipped in the current transportation system, particularly in quantities of 1. For example, UPS, one logical source for transportation, has size limits that shippers must follow. UPS offers next day delivery, but is only available for relatively small items. Thus, larger items that UPS (or other package services) cannot handle become less attractive as regular commercial trucking must be employed.

Similarly, products that are perishable (or in some cases time-sensitive) may have to be purchased close to the point of consumption. Meat and produce are examples that would present some delivery problems. However, EC may offer great benefits to other categories of perishable products. Gogan (1996-1997) points out that an empty hotel room is very perishable in that the value of an empty room falls to zero each night. Gogan (1996-1997) further suggests that the perishable nature of hotel rooms motivates hotels and resorts to provide information about their rooms and areas to customers online and to accept EC reservations.

6. PRODUCT PRESENTATION.

If a product can be adequately presented over the web (by text or pictures, or perhaps, video) then it becomes a likely EC candidate (Singh 1999). Other products, which the
consumer would prefer to try out, or "kick the tires," may find this a barrier to EC application.

7. CHANNEL CHARACTERISTICS.

Electronic Commerce represents a new type of market channel for most products. The characteristics of the existing channel may dictate against use of "direct selling." Businesses may feel like EC would undermine their existing channel (Pitt et al, 1999).

8. INFORMATION CONTENT.

To what extent is the value to the customer delivered in the form of information? This type of product is sometimes called "infocentric" (Quinn and Sviokola, 1997). Products with greater information content may be better suited for some form of electronic delivery. The more of the content of the product is in the form of information (before, during, or after the sale), the better it is a candidate for some form of electronic delivery.

In addition, EC, especially web-based EC, offers companies the ability to provide detailed information about products and services to customers (and potential customers) at very low cost. Further, this information can be updated quickly and easily. Customers purchasing complex products often require more detailed information than can easily be displayed on packaging or advertising; thus, EC offers organizations the ability to provide greater information at reduced cost (Gogan, 1996-1997).

9. FUNGIBLE PRODUCT.

Fungibility addresses the extent to which a product has become a commodity. This means that there is little difference (in the minds of the consumer) between the various offerings. The less specific offerings differ, the more likely that the consumer would seek the best price regardless of the venue. Such "efficient" market could be readily accomplished with electronic means.

IV. AN ILLUSTRATIVE EXAMPLE

How would these factors be employed? An example may be useful. Take the retail furniture business for example. This is category G. above. For factor 1., how will customers accept purchase of furniture without seeing it? There is a lot of thought that this is the sort of merchandise that consumers would prefer to see in person for an assessment of quality. Score that as a -. The furniture business has indeed relied on the skills of personal salesmen to present the products' best features, so that would be a -. 

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The furniture manufacturing and retailing industries have more than a reasonable penetration of information technology, so this would be a +. This product is indeed tangible, so score another -. Shipping is definitely an issue, score a -. It should be easy to present the product in terms of fabric, wood types, colors, etc. In fact, it should be a trivial task to allow the consumer to assemble his choice of materials and colors interactively. Score this a big +. The channel characteristics present some difficulty, but no more than many other industries. Leave this one blank. There is some information content in the pre- and post- sale dimensions, but the primary product value is the item itself. Leave this one blank also. Furniture is seldom viewed as a fungible commodity (except for high volume items like office furniture or others), so score this a -.

With two plusses, and five minuses, the result is a mixed analysis tending toward the negative. The future of internet furniture sales is uncertain. But those who figure out a way to emphasize the plus factors, and work around the negatives may be able to develop a solid niche business.

V. CONCLUSIONS

It is obvious that electronic commerce is a growing trend with the potential to influence many aspects of our society and economy (Parker and Grove, 2000). What is not obvious is the business vulnerability to electronic commerce. The current article's framework lets businesses assess their vulnerability to electronic competition. The framework presented herein is intended to provide a starting point for organizations to evaluate the viability of EC within their industries. The framework is not intended to be a perfect decision tool; exceptions do exist and should be considered. As EC evolves, future research is needed to confirm the importance of the factors listed above and to evaluate different industry and organizational practices in EC.

REFERENCES


