On the Road of Electronic Commerce -- a Business Value Framework, Gaining Competitive Advantage and Some Research Issues

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"But what ... is it good for ?"
Engineer at the Advanced Computing Systems Division of IBM, 1968, commenting on the microchip.

Abstract

This paper addresses the issue of understanding the components of the business value an organization can derive from using electronic commerce. This subject is currently a hot discussion topic, with some companies contemplating cutting back on their electronic commerce presence, as they cannot see the short term benefits.

We therefore propose a framework consisting of ten components of the business value of electronic commerce, showing how they can improve, transform or redefine current products, processes or business models. We illustrate these by examples of successful early adopters from the retail, banking and travel industries. These components are formulated as a set of propositions, which will need to be validated through empirical evidence.

The paper then addresses some general effects of electronic commerce, such as its potential for competitive advantage and its effect on intermediation in an industry. We link the ten business value propositions with Porter's model for competitive advantage within an industry. We finally review some of the current issues in dealing with electronic commerce systems and conclude by arguing that before any major project is undertaken, a solid strategy should be formulated, including the understanding of the sources of its business value and its strategic impact.

keywords: Internet-based electronic commerce, information technology, business value of technology, competitive advantage through technology, customer management strategies

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Table of contents

Section 1: Introduction

This paper describes the use of electronic commerce technology (using the World-Wide-Web, the multimedia interactive component of the Internet, as the main context) as an enabler to alter current market strategies. The basic question it

addresses is the definition of the business value of electronic commerce, through a framework describing ten of its components. The paper also helps define an electronic commerce strategy through a review of the issues, dangers and managerial implications of such strategies.

The organization of the paper is as follows: Section 1 introduces the field, Section 2 presents a framework to help understanding the added value of Web-based strategies and reviews their impact in different industries (banking, retail distribution and travel) through examples of successful early adopters. Section 3 links business value and competitive advantage, using Porter's model, and elaborates on intermediation within an industry. Section 4 discusses general issues in dealing with electronic commerce, such as privacy, implementation issues and organizational commitment.

1.1 What is electronic commerce

Electronic commerce can be defined as "the buying and selling of information, products, and services via computer networks" [1] We would extend the definition by including the "support for any kind of business transactions over a digital infrastructure". This matches with the broader use some companies do of electronic commerce. For instance, Silicon Graphics, a global manufacturer of high-end computing equipment, uses its presence on the World-Wide-Web as a way to provide information to its customers (e.g., access to product brochures and price lists), as a marketing tool (e.g., allowing a customer to contact a sales office), as a sales channel (e.g., on-line ordering of software products) and as a support line (e.g., making available software patches and frequently asked questions and answers). Another example is the recent introduction by the Bank of America of financial data exchange transactions over the Internet [2].

Seen from a buyer-seller perspective, and using a life-cycle model, electronic commerce can be used in all the phases of a commerce transaction:

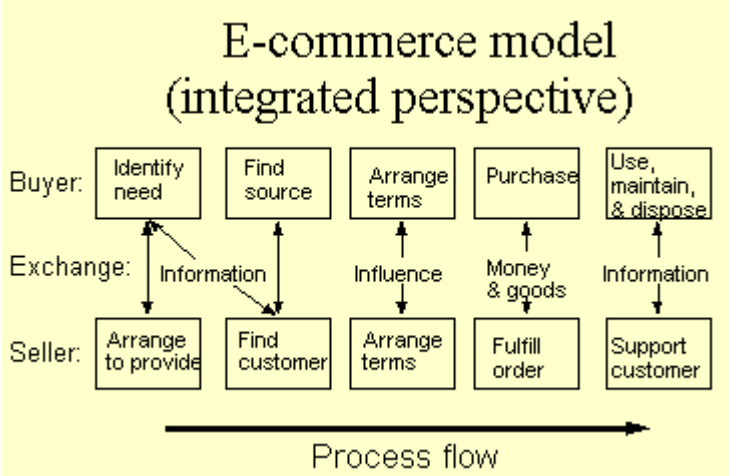

Figure 1: Electronic commerce model [3]

1.2 Features of electronic commerce systems

Electronic commerce systems can be of significant value as a lever for new customer management strategies, mainly because they

- directly connect buyers and sellers
- support fully digital information exchange between them
- suppress time and place limits
- support interactivity and therefore can dynamically adapt to customer behavior
- can be updated in real-time, therefore always up-to-date.

We assume here that the reader is familiar with typical electronic commerce systems, such as information distribution, electronic catalogs, EDI systems and electronic markets. A summary and a classifying framework can be found in [4], while [5] is a good introduction to the effects of electronic commerce on the economy and society.

We will consider here mostly consumer-oriented electronic commerce systems, i.e., systems which interact directly with end-customers, rather than business-to-business systems (for instance EDI). Issues such as alliances between companies through technologies or electronic platforms are therefore beyond the scope of this paper.

1.3 Is there an added value to electronic commerce ?

Not everybody is convinced of the value of electronic commerce for a company. Some, for instance, think the Internet is like the Gold Rush in the 1800s, where only Levi's selling jeans and pick sellers were making money. Others believe the World-Wide-Web is like China, i.e. that people investing now are there for the future but don't get much or any value today.

Our belief is quite different, and the objective of this paper is to demonstrate the value a company can derive today from using electronic commerce. This belief is supported by predictions of consultants such as McKinsey, which predicts that home shopping will be a US$ 4-5 billion market by 2003 [6]. Companies such as Silicon Graphics are also a living proof of the value of such projects: with more than 15,000 users visits a day, the brand awareness and communication possibilities created by their Internet presence would be unachievable by any other means, with a similar advertising budget.

A consulting firm recently published a study [7] outlining the shakeout expected in the Internet industry in 1996. Their arguments are that too many companies started investing without first having a sound business strategy. As the costs of running an on-line presence increase, companies would leave the Web, as they can't find enough business justifications to maintain their presence. We believe there is some truth in these findings, if only that a clear strategy has to be shaped before investing. Key to this strategy is to understand the value part of the cost-benefit analysis. It is the objective of this paper to help frame that value.

1.4 Technologies and convergence with business drivers

The technologies we include in electronic commerce are not limited to the Internet and the World-Wide-Web. These are obviously the most used today in consumer electronic commerce systems and will often be used in our examples, but this will change in the future. We would consider all interactive media technologies, i.e. the combination of an *intelligent device*, supporting *multimedia* data (text, sound, pictures, video, etc.) connected to an *open network*. As such, multimedia kiosks and interactive television fit well as electronic commerce channels.

The drivers for electronic commerce are both technological (under the tremendous pressure of innovation in the above mentioned fields) and business oriented. Some feel technological drivers are the only real ones, and business drivers are vague. Our goal here is to show that there is a solid business evidence that this is not a fad, by illustrating it through cross-industry examples.

It is customary usual to evaluate a new technology in an existing context, i.e. by exploring how this technology can be used to increase the efficiency of current processes. In this case, it would mean focusing on electronic commerce replacing traditional ways of ordering goods and services. But, as with each new technology, electronic commerce also enables new possibilities, unfeasible before, especially through its interactive nature. It is in that context that it should be evaluated.

Section 2: Impact on market strategies & business value framework

This section introduces the business value framework and is illustrated by examples from the retail, banking and travel industry. The field of electronic commerce is relatively new, and as such little statistical data or empirical research is available. Therefore, we formulate this framework as a set of *propositions*, which are based on examples from pioneers in the field and our intuition. These propositions should further be validated by future research, which will also help refine them (e.g. how sensitive they are to a specific industry).

2.1 Business value framework

This section presents a framework detailing the value of electronic commerce, especially the World-Wide-Web component (Web) of the Internet, for commercial organizations dealing with end-customers. A common way to evaluate the value of the Web is to look at the potential of selling products or information on-line. However, as we'll demonstrate,

restricting the value of electronic commerce to direct sales only ignores a major part of the business value. Evaluated by direct sales only, the Internet as a distribution channel cannot compete today with other direct-marketing channels. It is estimated that (in the United States) sales on the Internet in 1995 totaled 200 million $US, while conventional direct sales (by catalog, phone, TV) totaled 60 billion $US.

Making money from direct sales is certainly the first way of getting value out of electronic commerce. Nevertheless, there are many others. The following table describes the components of that business value:

The organization	Source of business value
Improve it	- product promotion - new sales channel - direct savings - time to market - customer service - brand image
Transform it	- technological and organization learning - customer relations
Redefine it	- new product capabilities - new business models

Figure 2: the components of the business value of electronic commerce

Our three "super-categories", improving, transforming and redefining the organization measure the amount of change in the global business model of an organization and the impact in terms of business results. Transforming an organization requires more creativity, more work, an additional level of risk and a different timeline than simply improving it. Obviously, the expected rewards match the additional burden.

It should be noted that, in some cases, an "improvement" of a business component (e.g. sales channel) will actually lead to a redefinition of the core business. The super-categories we propose should therefore be understood to be flexible, inter-related and overlapping.

Next, we describe these ten components of the business value.

2.1.1 Product promotion

Proposition 1*: Through a direct, information-rich and interactive contact with customers, electronic commerce can enhance the promotion of products.*

The first use of electronic commerce is to provide product information to customers, through on-line electronic brochures or buying guides. This can be seen as an additional marketing channel, allowing to reach a maximum number of customers. The advantages of electronic commerce as a way to deliver product information is its availability anytime, anywhere, provided the customer has the right infrastructure (e.g. PC, modem, online service) to access this information. But using an electronic medium also allows for interactivity and customization. Different ways to customize the advertising content, based on the customer profile or input, are to change the content description (simple or complex), display only a range a products which are relevant to the particular customer, change the price (e.g. discount for club members), allow for new functionalities in some cases (e.g. coupon available only in certain conditions) or change the path used to navigate in the service.

For instance, an electronic supermarket could provide different graphical user interfaces for kids, teenagers or housewives, with a look appealing to each of these segments. The advertisements appearing on the pages would also be different, with toys for the kids, music for the teens and jewelry for the housewives. This is coherent with trends in marketing, such as micro-marketing or one-to-one marketing [8] which try and target each consumer with a specific message, according to his needs and desires.

Another good example is Hewlett-Packard and its reference guide to buying a printer; the system asks the customer to

identify his/her needs (e.g. price range, need for color, etc.) and presents a customized version of the catalog, selecting only the printer models which the stated needs. In the service industry, Bank of America enables the customization of its "home page" on the Web, allowing the customer to bundle all the information services the bank provides in one convenient, easy to access page.

In a world with products being increasingly harder to differentiate, shrinking life-cycles, an abundance of traditional media messages and customers having too little time, electronic commerce offers an opportunity for new promotion strategies, enhancing the branding of products. As such, the quality of the "advertisement" is the primary value in product promotion.

2.1.2 New sales channel

***Proposition 2**: Thanks to their direct reach to customers and their bi-directional nature in communicating information, electronic commerce systems represent a new sales channel for existing products.*

Considering electronic commerce, and in particular the World-Wide-Web, as a sales channel makes sense for two kinds of products:

1. physical products, sometimes also sold in conventional stores, which can be advertised and/or ordered on-line, such as computer hardware or wine
2. products which can additionally be delivered over the electronic commerce medium, such as information or software.

Examples of the first type are the so-called electronic catalogs [9] such as the Internet Shopping Network, selling all sorts of electronic and computer related goods, or Virtual Vineyards, selling wine and food products. These catalogs offer information on the products, support on-line ordering and payment, and sometimes online customer service.

Electronic commerce strategies are of primary value in markets where information is of significant added value to the products being bought, rather than in commodity markets. For instance, in the wine industry, information on the winery, the type and quality of the wine, or the food it goes well with are of significant value to customers, and usually hard to get through the traditional sales channel (e.g. supermarkets, liquor stores, etc.) Centralizing this information digitally is therefore of significant value for customers.

The right packaging of information supporting the buyer's decision can also be a significant advantage. For instance in the case of Peapod [10], an "online grocery" selling traditional supermarket products through a computer interface, the ability to store shopping lists, recall them and modifying them significantly decreases the time a customer needs to do his shopping, therefore adding to the perceived value for the service. Similarly, the ability of the shopping software to automatically propose a substitute item with a reduced-price or to offer a coupon adds value by reducing the final bill. These features are only possible when all the information used in the purchase is digitally available and processed.

In the case of information products, the electronic commerce medium actually becomes the delivery medium. As such, an electronic newspaper does not use paper anymore and can be fully delivered digitally. In some cases, (for instance ZDNet, a service reporting on the computer industry), there is actually no paper version of the service. In another case, software.net, a company selling software, currently sells more than 300 packages which can be delivered digitally and used literally minutes after buying them.

By extending the notion of selling "informated" products, we see new product categories emerging. For instance, [11] referred to four ways of making money on the Web, the two last ones being new form of products:

- direct selling (i.e. selling products)
- content selling (i.e. selling information)
- advertising (i.e. giving out information such as news or directories for free, to drive traffic and sell it to advertisers)
- transaction & links (i.e. charging a fee for a transaction, such as selling an airline ticket on-line, or charging to link with a service provider, as in a yellow pages service).

2.1.3 Direct savings

***Proposition 3**: By using a public shared infrastructure such as the Internet and digitally transmitting and reusing information, electronic commerce systems can lower the cost of delivering information to customers.*

The third component of the business value of electronic commerce is in its opportunity to save on costs. By sharing a digital infrastructure such as the Internet compared to owning a physical one, marketing, distribution and customer service costs can be drastically reduced. The case of SunSolve, for instance, Sun Microsystems' online support service on the Web, is widely reported for having saved Sun over $4 million [12].

By using automated systems and a digital transmission architecture, personnel, phone, postage, and printing costs can therefore be reduced. This is especially important in service industries, where the cost of customer service usually exceeds the product costs (e.g. for banks, credit card or telecommunications companies). Checking order status, getting a usage statement or a bill are examples of activities which can be delivered much more cheaply using electronic commerce. In each case, the customer value is also higher, through a quicker reporting, or through the added information value (e.g. delivering not only a statement, but also historical statistics or graphics, adding advice to reduce some of these costs, etc.)

2.1.4 Time to market

***Proposition 4**: Due to their instantaneous nature, electronic commerce systems allow a reduction of the cycle time associated with producing and delivering information and services.*

In some markets or for some products, the ability to distribute or receive a product as soon as it's been created is of primary importance. This is obviously the case of information distribution. A company such as Newspage, for instance, distributes information on hundreds of topics using electronic mail or the Web, to make sure it reaches its targets (usually decision makers in corporations) as soon as it is available.

In the financial market, which very often leads the way in terms of complexity of the environment, some financial products (usually derivatives contracts) have return on investment in a matter of hours. Their life-cycle is often not much longer. It's in this type of environment, which will increasingly become routine for other industries, that the speed achieved by electronic commerce to quickly gather information on customer needs, assemble a product by adapting existing ones or assembling building blocks and distributing them will become critical. Linking network of companies, each doing part of that assembly work, is currently a growing research area [13], as initiatives such Commerce Net's CALS demonstrate.

2.1.5 Customer service

***Proposition 5**: Through intelligence built into systems and the extended availability of intelligent support systems, electronic commerce systems can enhance customer service.*

We already mentioned the case of Silicon Graphics and Sun Microsystems using the Web to provide customer support. The ability to provide on-line answers to problems, through resolution guides, archives of commonly encountered problems, electronic mail interaction (and in the future audio and video support), and all that 24 hours a day, 365 days a year, builds customer confidence and retention. Monitoring how customers use this support information also provides insights on improvement areas in current products and the list of issues encountered with products can be a significant source of product feedback for the design of new products. As consumers start using these systems in growing numbers, industries other than software will take note of these opportunities and deliver online customer service. Today, the Wells Fargo and the Security First Network Bank are two examples of banks offering on-line statements and answering electronic mail queries on bank accounts.

Two likely developments in this area are

- · products which diagnose themselves, and use an on-line connection to call a support specialist which can arrive on-site, either physically or electronically, with the full knowledge of the problem that needs fixing
- knowledge-based systems which assist customers in finding solutions for their problems.

Both have already been seen in specialized fields (such as high-end copiers from Xerox, mainframe computers from IBM or minicomputers assembly from Digital), but are likely to become accessible to a broader range of customers and for a wider range of products.

2.1.6 Brand or corporate image

Proposition 6*: Electronic commerce systems will become one of the components of a brand or corporate image, especially while targeting technology-friendly customer segments.*

This might be one of the most intangible aspects to measure, but building a brand or corporate image is of prime interest in some industries, those with commodity products or high competition. For instance, in the soft-drinks industry, Coca-Cola and Pepsi spend huge amounts of money to try to differentiate basically similar products (or to take a less controversial example, AT&T, MCI and Sprint in the telecommunications business). Others, such as Levi Strauss in the fashion industry compete with others in being seen as young, fashionable and "hip".

All of these brands use their Web presence as a way to affirm their corporate identity and their brand image, in addition to providing product information, etc.

2.1.7 Technology learning & organizational laboratory

Proposition 7*: Rapid progress in the area of electronic commerce will force companies to adapt quickly and offer them an opportunity to experiment with new products, services and processes.*

If what we mention in this section is true, it will have a large and durable impact on the strategies of most organizations. Therefore, it is critical that these organizations quickly become familiar with the technology. The learning curve of mastering such technologies, and understanding their power to reshape customer relationships, is steep and can't be achieved overnight. It is very often an iterative process, requiring organizations to try new offerings, and tweak them according to customer feedback.

In a similar fashion, new technologies require new organizational approaches. For instance, the structure of the group dealing with electronic commerce might have to be different from the one typically used in the organization, in order to be more flexible and responsive to the market, or new processes have to be put in place, for instance to deal with the authorization of publishing corporate information on the Internet. This type of corporate change needs to be planned and managed, and before getting it right, organizations might have to struggle with different experiments.

The value of both types of learning resides in the new capabilities the organization acquires, and the potential of using these capabilities in the future, as the market develops and customer expectations become clearer. The product and process innovation which appears in one corporate division is also positive, as it can be reused across divisions if success is achieved.

2.1.8 Customer relationships

Proposition 8*: Electronic commerce systems will allow for more personalized relationships between suppliers and their customers, due to their ability to collect information on customers needs and behavioral patterns.*

According to Rayport and Sviokla [14] "in today's world of overcapacity, in which demand, not supply, is scarce" there needs to be a shift from supply-side to demand-side thinking, and organizations need to "sense and respond" to customers' desires rather than simply make and sell products or services. The focus is therefore on establishing relationships with customers, based on learning their needs and desires, proposing the right products and keeping these relations active throughout the years.

The role of technology in learning about customers is its ability to record every event in the relationship, such as customers asking for information about a product, buying one, requesting customer service, etc. Throughout all these interactions, either over the phone, in person or on-line, the needs of the customer are identified and will feed future marketing efforts [15]. For example, if we use the example of the on-line travel agency, its ability to store and remember customer habits (e.g. always flies out of this specific airport, likes window seats and requests vegetarian meals) and particular data (e.g. frequent flyer numbers, preference for a particular rental car company, etc.) will establish a relation where the customer feels particularly comfortable in dealing with this particular travel agency.

All that data acquired about customers also allows provides a switching barrier, as customers would have to "teach" a competitor all that information. Moreover, a historical analysis of the data will reveal who are the most profitable customers (usually 20% of a company’s customers generate 80% of the benefits) and products, therefore allowing to reduce the scope of products, to focus on the most profitable ones, and extend a product line by adding products likely to

cater to the needs of these most profitable customers. Then, by understanding the segment of customers which are most interesting, specific marketing efforts can be targeted to similar individuals, currently non customers [16].

Becoming a trusted partner of a customer is key in maintaining these relationships. It can be achieved by providing him or her with valuable information. That pro-activity is likely to generate additional sales volume. Pro-activity is the ability to use the direct channel with the customer to inform him of specific offers which would match his/her needs and buying patterns. For instance, early in the summer, you would propose special offers to a customer who's used to buy swimming suits through an on-line catalog. This could be done by an electronic mail sent to the customer's address, with a link to a specific page of the electronic catalog, and maybe a discount coupon to thank him for his loyalty.

Another example of such a strategy is currently used by Amazon, an electronic bookstore on the Web. Amazon allows its customers to program agents, which will send them relevant information. Let's suppose you're looking for a book on technology and strategy. Amazon will provide you with a list of the existing books, but also offer you to keep your request "in mind", and send you information on titles published as they arrive. This information is sent through electronic mail and links with the online bookstore.

What electronic commerce brings as a lever to such strategies is the automation of the customer profile, his needs, buying patterns, etc. All that data can then be analyzed through computer applications and the right answer chosen. Therefore, personalized service strategies which were before only achievable with a small number of customers suddenly become possible on a wide scale [17]. For instance, in the past, the corner video-rental store owner might well have known your viewing preferences, and therefore advise you on new movies, but only through automated systems does this strategy stay feasible on a large scale. In this video example, a national chain could use that system to differentiate itself and increase customer retention by maintaining a global database of customer preferences. If you moved to a different city for instance, you would still be able to insert your membership card in a multimedia kiosk and get advice on which new rental choices better suit your taste.

On a more commercial level, CompuBooks, another bookstore on the Compuserve online service, sends customers an electronic mail message when they haven't visited their store for a while. The incentive to return is a few dollars of usage credit if they buy a book.

2.1.9 New product capabilities

Proposition 9*: The information-based nature of the electronic commerce processes allows for new products to be created or existing products to be customized in innovative ways.*

A large source of the business value electronic commerce can provide comes from changing the products themselves, in addition to the way they are advertised, ordered or delivered. This is mainly due to the potential of collecting information which will be used to customize products.

Mass customization has been used for some time now [18]; it endeavors to create specific products for each customer, based on his or her exact needs. For instance, thanks to an information network and advanced production techniques, Motorola is able to gather customer needs for a pager, transmit them to the manufacturing plant, manufacture a specific model (varying the form factor, color, features, etc.) and send it by overnight mail, all that in a few hours. Levi's, the jeans manufacturer, has brought similar techniques to the apparel industry [19], with the ability to custom produce a pair of jeans, based on specific customer requirements, thanks to an electronic network linking the retail shop (where the customer chooses the type of jeans, and her measurements are taken), the producers of the various parts of the jeans, the assembler and the shipping company. In both of these cases, the key is the ability to store customer preferences, use a flexible manufacturing technique to adapt a product to their particular needs and operate a network of suppliers which will join together to manufacture and deliver a product.

In the future, electronic commerce links between customers and suppliers will suppress the need for an infrastructure to gather customer data (a shop in our case) and will allow customers to do it from home, their office or on the road. This direct link also allows the supplier to gather very detailed data on customer profiles, their needs, patterns of buying, etc. Database marketing techniques [20] can then be used to analyze this data, in order to improve new product development and target specific offers to certain customers. Gateway 2000 is a good example of a supplier custom-manufacturing personal computers, and offering product information which can be adapted to personal needs through their Web site.

Another opportunity in mass customization is to have the customer design part of the product himself. For instance, we could imagine a watch manufacturer with advanced production techniques, such as Swatch, providing its customers with computer-based tools allowing them to design part of the watch (e.g. the drawing on the background of the watch) and send these designs through a computer network to the watch manufacturing robot, before shipping the personalized

watch to the customer. The ability to sell unique-design watches to customers at a retail-like price would be a great differentiating factor.

This creates a paradigm shift in the design of products, which is not perceived by every actor today. For instance, the Credit Card Network is a Web site which basically lists different types of credit cards offered by US banks, both on-line and off-line. All of these cards offer different features, such as interest rate, membership fees, credit limits, insurance, assistance programs, frequent flyer bonuses, etc. The customer is asked to look at the different offerings, and then choose the package which best conforms to his or her interests. It seems that the business model of this service could be changed, to take opportunity of customizing products. We would envision a service where the customer would be asked to check the features which matter most to him/her (e.g. a frequent traveler paying his invoices in full every month might choose only frequent flyer bonuses and rental car insurance). A custom credit card package could then be designed especially for this customer, who would receive exactly the features he asks for, and no more, therefore avoiding to pay fees for services he doesn't use. The interest rate or annual fee would be adjusted for each customer, based on the services that need to be provided and the expected revenue for the credit card company. This is similar to the Swatch example above, in the sense that the customer designs the product he wants to buy.

2.1.10 New business models

Proposition 10*: Changing industry structures and electronic commerce systems allow for new business models, based on the wide availability of information and its direct distribution to end-customers.*

Going further than new ways of selling existing products or services and the opportunity for new ones, we also see new business models emerging. Key among these new business models are new forms of intermediaries, or information brokers [21]. Although it is true that electronic commerce will disintermediate some industries, by directly connecting buyers and sellers, we envision new opportunities for actors repackaging information. The early examples are currently the directory providers or the search engines, such as Yahoo & Lycos. Also, in the car industry, Dealernet offers comparisons between any type of car, with pictures, product specifications and third-party reviews.

We won't expand more on that subject here, as intermediation is discussed in detail in section 3.4.1

Section 3: Electronic commerce and competitive advantage

After looking at the sources of value of electronic commerce for an organization, this section explores the effects of electronic commerce and its potential for competitive advantage. We use Michael Porter's seminal work [22] on industry analysis as a framework, and map our business value components to Porter's

1. three generic competitive strategies for a company;
2. new entrants and substitute products;
3. value system analysis, with the pressures from suppliers and customers.

We then discuss in some more detail a few interesting issues such as intermediation, pure price competition and strategic disadvantage.

3.1 Porter's framework

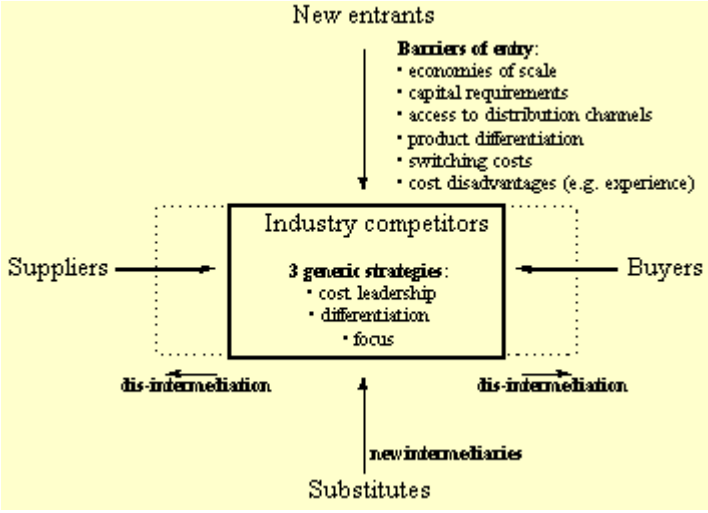

Figure 3: Porter's analysis framework of competitive advantage

We will formulate here nine propositions of the effect of electronic commerce on the competitive dynamics in an industry. We group these propositions according to three axes:

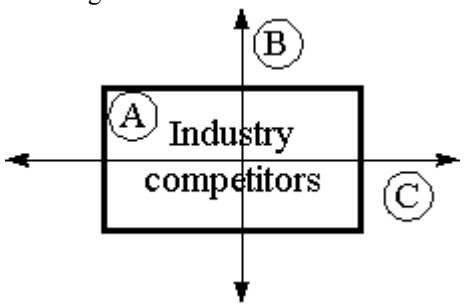

Figure 4: analysis axes for electronic commerce

The first axis focuses on the generic strategies of a single company to get a competitive edge, the second looks at the potential for new entrants in the industry and for substitute products, while the third axis emphasizes the pressures of customers and suppliers on the value system, and looks at the potential of electronic commerce for disintermediation within an industry as well as the notion of strategic disadvantage.

3.2 Generic competitive strategies

Porter's three generic strategies are cost advantage, product differentiation and focus. Focus means concentrating on one segment of the firm's customers and providing them with an extremely well-targeted set of products, excellent service, etc. Our three propositions show that electronic commerce can support such strategies. We refer here to our 10 business value propositions by naming them p_n (e.g. p_1 is product promotion).

Using electronic commerce systems on the Internet (or similar systems) ...

proposition A1*: ... offers a cost advantage through less expensive product promotion (p_1), cheaper distribution channels (p_2) and direct savings (p_3).* This emphasizes how the Internet allows small companies to act as much larger ones, by using a "free" or very low-cost infrastructure to promote their products on a global basis. As such, the Web can be seen as a great equalizer, replacing an often costly distribution network by a public or widely shared infrastructure.

proposition A2*: ... helps a company to differentiate itself not only through price but through product innovation (p_9), time to market (p_4) and customer service (p_5).* Price competition is the subject of section 3.4.2

proposition A3*: ... allows for customer focus strategies through better customer relationships (p_8).* This is the idea introduced at section 2.1.8 of focusing on a specific set of customers and deliver the best service to them. Electronic commerce enables this strategy for a larger number of specific segments, by using information technology for

personalized service on a larger scale and mass-customization of products.

3.3 New entrants and substitute products

Using electronic commerce systems on the Internet (or similar systems) ...

proposition B1*: ... allows easier entry into traditionally hard to access markets, due to less expensive product promotion (p_1), new sales channels (p_2) and reduced capital requirements (p_3)*

proposition B2*: ... allows to raise the entry barriers in some markets through extensive customer learning (p_8) (which makes switching more expensive), product differentiation (p_4, p_5, p_9) and experience (p_7)*

proposition B3*: ... facilitates the introduction of substitute products in a market due to product innovation (p_6).*

3.4 Intermediation and strategic disadvantage

Using electronic commerce systems on the Internet (or similar systems) ...

proposition C1*: ...makes it easier to suppress an intermediary in a distribution network, due to direct customer contact (p_2) and the use of a publicly shared infrastructure*

proposition C2*: ...makes it easier to become a new intermediary in an industry, by providing an added-value service through information management, such as integrators or re-packagers of more basic services.*

Section 3.4.1 elaborates on the aspect of intermediation. Note the dual role of electronic commerce in suppressing certain forms of intermediaries, while facilitating other types.

proposition C3*: ...makes it possible to catch up with competitors thanks to the maturity of some technologies and learning experiences (p_7), and are critical in not losing ground as market dynamics shift.*

Section 3.4.3 details the issue of strategic disadvantage.

3.4.1 Impact on intermediation

The change in the distribution structure of an industry is an interesting one, in particular the impact on intermediaries. These were traditionally providing an infrastructure such as a sales network (physical places such as shops, specialized personnel, etc.) and managing the complexity of handling customer requests. Electronic commerce can replace some of the functions traditionally performed by these intermediaries. For instance, Southwest Airlines looks for more vertical integration (i.e. tries to replace the usual network of travel agencies) by providing timetables, detailed fares and soon offering reservations on the Web. For an example in the art industry, see [23].

We believe advanced forms of information intermediaries will soon emerge, thanks to the integration capacity of electronic commerce. The reason direct connections between buyers and sellers are not always the optimum form of commerce for customers are multiple:

- when doing comparison shopping, the cost and time required to access multiple suppliers systems increases rapidly, this is the famous information overload problem
- most often, customers look for total solutions, whereas suppliers are specialized in one area
- customers need a trusted third-party to provide them with information about the reputation of a particular supplier, this is a role magazine reviews play well.

Therefore, we will see new players emerge. They will reduce the cost of looking for the cheapest or most attractive product, will integrate various services to provide one-stop shopping and will use third-party content to validate the

quality or reputation of their offering.

Integration will be a key point for these actors. It is the ability to sell a package of products to customers, based on a very fine understanding of their needs. For instance, in the travel industry, once you understand a customer's needs for a specific travel, an on-line travel agency service could dynamically put together a package of air travel ticket, hotel reservation, car reservation, travelers' checks, restaurant guide, etc. which would serve these needs [24]. In the banking industry, integration would mean the ability for a bank to analyze its customers records and offer integrated services to those with a certain revenue level, demographic profile or complexity of financial activity. The bank would then offer them mutual funds to maximize their savings, life insurance to protect their future and tax preparation services to simplify their life. The Security First Network Bank, the first bank on the Internet, seems to be moving quickly towards such systems.

The emergence of these new information-based competitors is not without danger for current industry actors. The ability of non-industry competitors to take a significant part of the business should not be under-estimated. For instance, in the banking industry, a recent report from a consulting company [25] predicts that 25% of the global electronic payment market will be taken by non-banks and high-technology companies.

Another danger we can forecast after the emergence of these intermediaries is their reliance on their brand name to take a big part of the market (i.e. industry concentration). For instance, in the personal computer market, if PC Magazine, which owns a great brand and achieves recognition in the marketplace, were to create an electronic catalog with its Editor's Choice (i.e. the computers the magazine recommends as best buys), this could lead to customers going to the most reputable magazine, to buy the most renowned computers, maybe from the most well-known mail-order company. This could create a competition barrier for smaller actors.

A proof that suppliers fear these systems is shown through an experiment of automatic shopping agents for audio compact disks, by Andersen Consulting which has shown that most retailers close their electronic doors to such programs, as they believe competing on price only is unfair.

The issue of intermediation is generic and affects many industries such as automobile distribution, banking, retail and travel. Dangers are appearing both for current intermediaries and for product suppliers. We just showed that opportunities were emerging for new intermediaries to appear. Therefore, current third-parties should look very carefully at their business model, in order to reposition themselves, when the added value they provide over an electronic commerce system is minimal.

In the travel industry for instance, repeat business travelers see no point in using a traditional travel agency when an automated system can handle a simple request just as well, with the convenience of an automated information and reservation platform, accessible anytime. Gradually, increasingly complex requests will be handled by these systems, and travel agencies will have to find new ways of differentiating themselves.

SABRE is an example of a company which is currently repositioning itself. It used to leverage a huge data network and computer operations in travel agencies around the world, providing them with information and reservation services. The advent of cheap computer hardware and open computer networks (such as the Internet) makes it much more feasible for them and for airlines to go directly to consumers. Therefore, SABRE is repositioning its added value by outsourcing its computer and network operations and focusing more on the added value of their information database (the content vs. the infrastructure).

Product suppliers could also potentially lose ground in the marketplace with the emergence of electronic commerce systems. We mentioned before how valuable was the information on the profile of customers, their buying patterns, their needs and desires, etc. If that information is kept by the intermediary, which simply aggregates customer requests before passing them on to the product supplier, the latter loses touch with his market [26]. In the pharmaceutical industry, the emergence of HMOs (health management organizations) and other intermediaries between customers and suppliers has reduced the share of the customer's dollar going to the manufacturers from 67% to 60% [27]

In the banking industry, the emergence of online banking platforms from suppliers such as Intuit raises interesting questions. Through their personal finance management software, Intuit has created a huge customer recognition in the marketplace (they have about 7 million very dedicated users). They currently have links between their software and 37 US banks to allow customers to get on-line statements, transfer money between accounts, pay bills or get portfolio updates. Other banks, most notably the Bank of America (BofA, the 2nd largest bank in the country) have chosen to develop their own electronic banking platform, through the acquisition of another software supplier. Some of the urgent issues that these banks now face are:

- how will these 19 banks, which online service look exactly similar as they use the same software platform, be able to differentiate themselves ?
- if a customer is a long-time Intuit user and the BofA chooses another supplier, will the customer switch banks in order to keep using his favorite software package ?
- if the contract between Intuit and one of these banks ends, will customers switch banks to keep their access to the service ?
- what prevents Intuit from creating its own bank and "stealing" all the customers it currently serves on behalf of other banks ?, i.e. who appears as a bank to the customer ? - Intuit (which is the interface), or the bank (which is the real service provider) ?

This raises the question of fidelity between suppliers and customers, and the issue of exclusivity in the relations between software providers and banks. These issues are also transposable to other industries. In the insurance business, consumers will soon be able to post their needs on a Web site, and have on-line insurance companies provide them with quotes for tailor-made policies [28].This will definitely change the rules of competition in this industry.

3.4.2 Pure price competition

This is a form of competition that will emerge in the electronic world with the emergence of the storefronts, offering similar products with various level of services. Let's imagine we have two different online travel agencies, both selling airline tickets through the Web. One of them, named El Cheapo, will provide a bare-bone service, offering very cheap tickets to customers who exactly know what they want. The other, MSDTA (Multi Service Digital Travel Agency) is much closer to our description in the previous section, i.e. it provides the customer with multi-media information on the various products it offers, offers a customized travel plan, etc. In order to cover the costs associated with the development and maintenance of such a system, MSDTA has slightly higher prices. The issue is to prevent potential customers from getting information from MSDTA, for free, before buying from El Cheapo to take advantage of their better prices. It is an issue that already exists today, although a customer can't regularly request work from a travel agent without buying once in a while.

3.4.3 Strategic disadvantage

New technologies allow an organization to quickly catch up with its competition. With time, technologies gain maturity, which reduces the cost and effort to implement systems. However, if not used, they can become a potential source of strategic disadvantage. If a company offers services or products through the Internet for instance, and its competitor does not, customers might well switch suppliers, especially in industries where switching barriers are low. For instance, an "early adopter" customer might decide to switch banks if one can offer him electronic banking capabilities, such as electronic bill payment, interactive on-line (therefore always up-to-date) bank statements with statistics or information on companies where he owns stock.

Some large companies are well aware of that phenomenon: when Federal Express launched its Web site (November 1994), allowing customers to track packages on the Web, United Parcel Service, (UPS), its major competitor, quickly accelerated its development efforts, which resulted in launching a similar service, although six months after FedEx. Today, both services are very close functionally. The third major competitor in the express package delivery industry, DHL, plans to have a similar service available mid-1996, having been slowed by technical integration problems.

Although the potential strategic disadvantage for followers is clear, the value of the competitive advantage for the leader is also unfortunately time-limited. The only source of sustained competitive advantage therefore comes from having an infrastructure, both technical and organizational, which allows for continuous innovation, to always be in front of the competition.

Section 4: Issues in electronic commerce

This section discusses some pitfalls and issues on the way to electronic commerce, and addresses some potential solutions. For now, we consider them as variables external to our model, but important to our understanding of electronic commerce. Whereas our ten business value propositions require further empirical validation, based on organizations' experiences with the theory and its implementation, the issues covered here require some more conceptual work to be resolved. Future work to test and confirm the value propositions will need to take these issues into account.

In this section, we discuss the following issues:

- customer relations
- privacy and security
- electronic payment systems
- mass-market adoption
- implementation issues
- organizational commitment

4.1 Customer relations

Early experiences with electronic commerce in the banking industry, which has been a pioneer in the use of electronic systems, can be used to learn of some potential dangers and issues to be taken into account. The use of Automated Teller Machines and electronic home banking systems has increasingly allowed customers to bank outside of traditional bank facilities, for most of their usual transactions. This was consistent with the cost-savings strategy of most banks, which discovered that electronic transactions were about seven times less costly compared to the manual handling of these transactions by a bank teller.

Nevertheless, the fact that customers' only contact with their banks was through (rather unsophisticated) electronic interfaces, and the major difficulties in integrating the legacy systems of a typical bank, prevented banks in many cases from selling additional products to customers (cross-selling). In some european markets, the insurance companies took opportunity of that to grab business from banks, selling savings products to customers through their extensive distribution network. Similarly, the decrease in human interaction with customers could also lead to a less sophisticated understanding of their needs, as they're not always able to express comments, criticisms or requests for new products while interacting with machines.

This should lead to a design of electronic commerce systems which incorporate capabilities for customer understanding and for proactive selling of new products.

4.2 Privacy and security

Another potential source of trouble are customer concerns with privacy and security, which could lead to a backlash against suppliers using such systems, or simply to customers avoiding the use of these systems. Some believe that customers will be reluctant to provide their suppliers with data on their demographics information, buying patterns or product needs. Unfortunately, this data is critical in many of the strategies we described earlier (mass-customizing, customer relations, pro-activity, etc.) There are two ways of handling these concerns, either customers can be made aware of the benefits of volunteering this data (e.g. products better suited to their needs, reduction of the junk mail as commercial offers become closer to their real needs), or material incentives can be offered to customers to attract them. This is already used in contests or coupon offers, and most customers would be ready to volunteer personal data if offered frequent-flyer miles in exchange, for instance.

A widely cited issue with on-line systems these days is security, although many specialists consider it to be a matter of perception rather than reality [29]. Nevertheless, customer perceptions are really what matters in terms of new technology adoption. The only answer which can currently be given is that the security of on-line systems is evolving quickly, and that by the time an electronic commerce strategy will be implemented, new technical solutions will have emerged. At this stage, most security systems are good enough to be used for most commercial transactions, and the evolving legislation in the field will allow the development of better systems (i.e. crypto-systems with longer keys) and their export worldwide.

4.3 Electronic payment systems

Electronic business transactions can only be successful if financial exchanges between buyers and sellers can occur in a simple, universally accepted, safe and cheap way. Various systems have been proposed, some of them based on traditional mechanisms (e.g. credit cards accounts) while others rely on new designs, such as electronic money. The key here will be to find a few widely accepted mechanisms, which can be used by most actors. The recent agreement between Mastercard and Visa on *one* security standard for credit card transactions over the Internet, and its backing by most major software vendors is one step in the right direction. This doesn't diminish the need for more specialized systems, for instance to allow *micro-transactions*, the exchange of very small amounts of money (a few cents) in exchange for

information or services. These new payment mechanisms will in turn enable new business models such as pay-per-article newspapers.

4.4 Mass-market adoption

A key to the success of consumer electronic commerce system is certainly a wide customer adoption of such technologies. It is not clear when this will happen and, although there are lots of learnings and benefits to be derived now, the mass-market adoption of such technologies will take a few more years to come.

The following figure shows some of the factors linked to new technology adoption by consumers (the factors adversely affecting adoption are in *italics*).

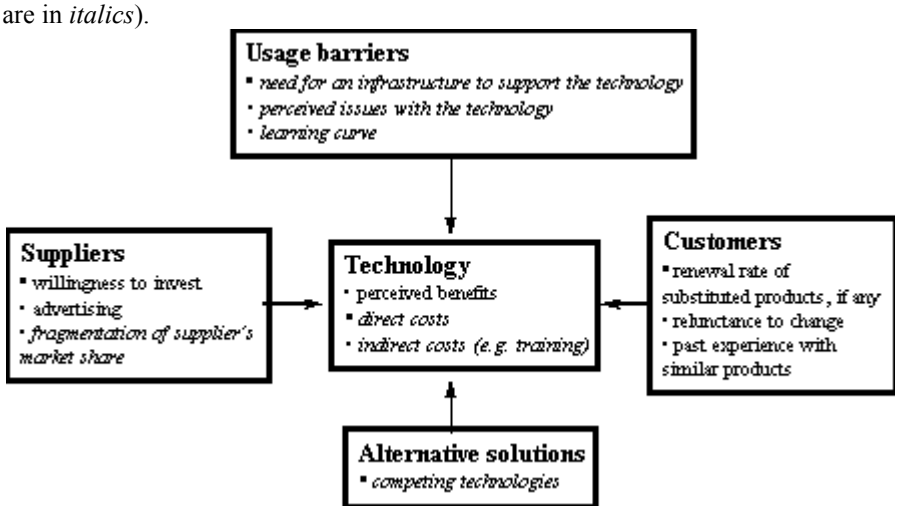

Figure 5: factors affecting new technology adoption

The reluctance of people to change is certainly a key issue here, as is the availability of appropriate technological platforms in every home. The emergence of the low-cost "Internet computer" and of interactive television will undoubtly quickly change the marketplace. As with most new technologies, adoption is linked to the supply of the right products, rather than demand. This is because customers not familiar with the new technologies cannot define their needs, and will understand the technology possibilities only through innovative products.

We don't have today quantitative information on the links between the factors shown above and new technology adoption, but future research might help clarify these.

4.5 Implementation issues

This section discusses some implementation issues and the managerial implications of creating, managing and getting the benefits of an electronic commerce system. Basically, it revolves around the realization that technology alone will not solve issues or create advantages. This technology needs to be integrated in an organization, with the change management issues linked to people resisting new concepts and ideas. It also needs to support a clearly defined and well communicated business strategy.

We adopt here a summarized model of an organization, and see the alignment between these different components as the main issue in establishing a sustained competitive advantage. Some authors [30] have called this alignment the "fit", and argue that only companies that know how to create this fit and maintain it through various kinds of environmental change will be successful in the long term.

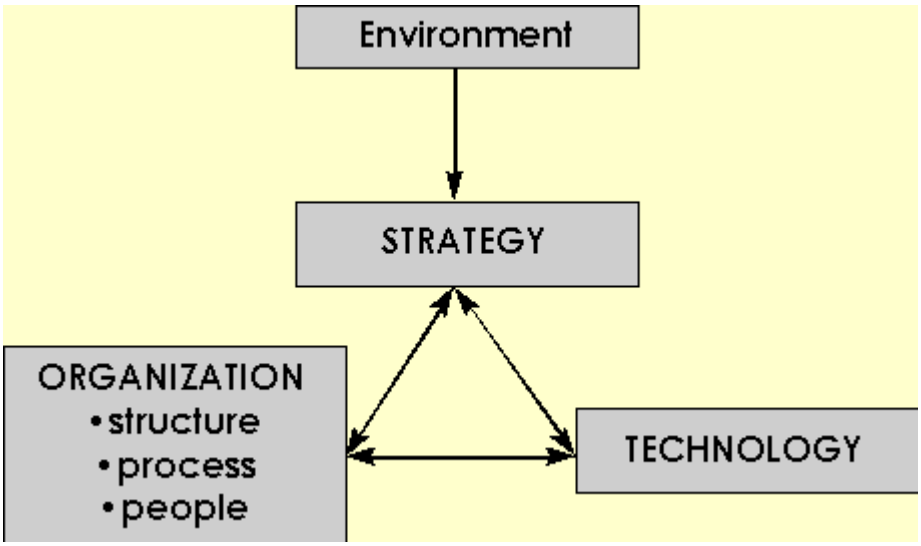

Figure 6: a simplified model of an organization

The issues of alignment or balance relevant to electronic commerce systems are

- between strategy and technology
- between technology and the organizational processes
- between technology and people

We've extensively covered the link between technologies and the strategies they enable in the section 3. It should be clear by now that these systems can be key in differentiating a company from its competitors. Nevertheless, technology in itself will not be sufficient to achieve that: the level of service provided to customers and the relationship that can be established with them will be also critical in preventing customers from switching providers. Only when the loyalty of customers will be high, through their investment in the relationship with their suppliers and sometimes the business and technological integration of the supplier in their customer processes, will a sustainable competitive advantage be created.

There are two ways of seeing the alignment between technology and the organizational processes. The first is the need to redefine some processes after the introduction of electronic commerce systems, so that these systems become fully integrated in the way an organization does business. Three examples of such redefinition are:

- when a Web system is used to broadcast corporate information, there is a need to authorize each specific piece (or class of) information which becomes public. Therefore, the process handling corporate communications needs to be refined
- the logistics processes (the back-end) need to be integrated with the on-line ordering systems (the front-end) to provide uniform and seamless service. There is little use for an on-line system if orders have to be manually re-keyed in another system before they can be processed. This often requires integration with legacy information systems
- whenever customer contact becomes possible through an on-line media, the customer expectations of the company's reaction change. By using electronic mail, which is usually answered in a few hours, a day at the maximum, when dealing with a company, the customer expects a similar response time. But it often happen that questions/comments coming through e-mail take the same path (i.e. process) as written queries, traditionally answered in a matter of days. The advantages of on-line communications therefore disappear.

The other way of aligning processes and technology is to use the latter to enable a redesign of the processes, thereby reducing the cost, time and number of errors associated with the process, while increasing the service level. This is often the focus of business process reengineering methodologies [31]

When information technology and processes become fully integrated, one can see the emergence of new business models for companies, "digital companies", i.e. fully integrated organizations fully relying on information technology both for customer interaction and internal management. The Internet Shopping Network and Virtual Vineyards are two examples of such companies, where order taking, inventory & order management as well as financial systems are all tightly integrated.

As the CEO of Wal-Mart, a very large US retail chain says, new technologies need to be aligned with people's understanding and capacity of dealing with them [32]. An example of the impact on the human resources can be seen while looking at the competencies required by the team designing and implementing an electronic commerce system. This team needs people with a strategic vision, an understanding of the various internal business processes which will be affected, knowledge of the legacy information systems with which to integrate the new systems, a strong technological mastery but also graphical design skills, etc. Therefore, only a cross-functional team including specialized outside partners will be able to successfully lead such a project.

These issues of alignment should be kept in mind while designing an electronic commerce strategy and its implementation plans.

4.6 Organizational commitment

The final issue we will mention here regards the organizational commitment necessary to successfully run an electronic commerce system. Although it is true that the Web today represents a great way to test some commercial ideas with a low cost of entry, and thus is a great equalizer and a real marketplace for innovation, a working system very soon requires additional resources, in terms of technology and skills (e.g. professional design, integration of legacy systems, process integration, etc.) The experience with the Web shows that most systems started by small entrepreneurs have been bought by larger companies, as they needed more resources to expand.

With large actors present on the market, customers become accustomed to increasingly higher quality systems. New technologies, such as interactive "applets" or the integration of audio and video also increase the complexity of developing an on-line presence. The cost of such systems is often an order of magnitude higher than start-up ones. As an example, a popular on-line music store, allowing customers to sample music online before ordering, is built using the most powerful Silicon Graphics Web server, uses 400 gigabytes of disk space, and has a hardware budget of roughly half a million US$. The most popular publishing site on the Web today, Time-Warner's Pathfinder, currently employs about 100 people, to develop and maintain its content.

Therefore, a sustained presence in cyberspace requires a strong organizational commitment, to increase the resources devoted to it as success proves the validity of the business model. This should of course be compensated by increased financial revenues, justifying the additional costs.

Section 5: Conclusion

Throughout this paper, we've endeavored to describe the rationale for an organization to build an electronic commerce presence and showed the link with the competitive advantage that could be derived. Then we've showed the implications it had for the management of these organizations and some of the pitfalls they would have to avoid. The key point therefore, is that building any kind of electronic commerce system requires a *strategy*, i.e. a vision of the goal to achieve, a clear rational of the business value and a picture of the process to achieve such a goal while avoiding common pitfalls. In our opinion, this is the only way of getting real benefits from such a system. This strategy should include an understanding of the impact of electronic commerce on an industry structure, the potential for new business models and the opportunities for competitive advantage.

There is a view shared by some experts [33] which advocates that organizations should build an electronic presence without regard for the benefits, as costs are (apparently) low. We believe that this kind of vision is the cause for the disillusion of some companies after setting up their electronic presence, and the reason for some predictions of a decline in Web usage for commercial companies. That view has often been caused by a difficulty to clearly articulate the real benefits which could be derived from being online, and one of the objective of this paper is to clarify that point.

We propose the use of the business value model presented in this paper to identify which electronic commerce system a company should build, based on its current strategy. This can be done by matching the components of the business value to the particular company, and looking which of them are relevant to its products, processes and customers. The competitive advantage model could be used to study a specific industry and identify the threats and opportunities that electronic commerce-driven change will imply.

Future empirical and conceptual research will be helpful in refining and validating our propositions, and will become possible when a sufficient number of experiences is collected and studied. It will be interesting to collect data on those

companies who really transformed their business model and customer impact through electronic commerce systems, and derive critical success factors and sound business practices from them.

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The http://www.xxx.com are Uniform Resource Locators (URLs), Internet locations for Web services. In the fast changing world of electronic commerce, there is often no better reference than the source. Feed these URLs to your favorite Web browser and explore !

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