



## UNDERSTANDING ELECTRONIC COMMERCE FROM A HISTORICAL PERSPECTIVE

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### ABSTRACT

The aim of this paper is to use historical insights from modern commerce as entry points to examine the macro-level phenomena associated with electronic commerce (EC). Commerce in its modern form first appeared in early 13<sup>th</sup> century Italy where conducive political conditions existed. Trade facilitated the exchange of goods, thereby enhancing the efficiency of processes between production and consumption. Even more important was its role in raising the level of human capital, promoting the spread of ideas and information, changing people's attitudes and behaviour. Some modern business practices and institutions which evolved with modern commerce are bookkeeping, modern banking, commodities market, putting out systems (or outsourcing as we know it now), insurance, stock exchange, and venture capital.

The current historical context favorable to EC is globalization. The emergence of network organizations helped to establish some of the practices supporting business-to-business electronic commerce. EC holds the potential to reduce time and transaction costs. However, the historical perspective suggests that the most profound implications of EC are likely to be at the macro-level or socio-institutional level. Some implications can already be seen while others are still developing. We are witnessing the impacts of EC on older business practices, and business models while there are likely implications for business cycles. Such a perspective can provide pointers for future research. Lessons from history suggest a need to pay due attention to intervention at the socio-institutional level to reap the benefits of this form of commerce.

**Keywords:** e-commerce, history, economic institutions, societal implications

### I. INTRODUCTION

E-commerce is a commercial activity dealing directly with the trading of goods and services and with other related business activities, in which the electronic communication medium plays a central role. These activities include the communication of information, the management of payment, the negotiating and trading of financial instruments, and the management of transport. As an economic activity, EC represents an inter-play of physical, human and societal resources.

- Physical resources include natural resources, technologies and physical infrastructure.
- Human resources refer to human labour, knowledge and skill in their broadest sense.

- Societal resources include resources residing in moral and ethical systems, institutions, culture, language, social harmony and community spirit.

EC operates within the constraints of these three resources while, at the same time, influencing and moulding them. These three resources have much in common with the human, physical and natural capital identified by the World Bank [2000] in a model used to investigate growth and development.

This paper aims to contribute to a meaningful and well-informed examination of the macro-level phenomena associated with EC, and why economists and policy-makers should pay due attention to them. It further aims to show that solid theoretical and conceptual frameworks for guiding research into EC can be found based on a study of the history of modern commerce. I assume that history is indispensable in shaping our understanding of the present and our quest for enlightenment on the future is rooted in understanding of the past and the present. Insights from the past are meant to serve as entry points for studying the on-going e-commerce.

What can we learn from history of modern commerce<sup>1</sup>? Commerce increases the efficiency of the processes between production and consumption. This relation may be termed the first order effect. However, historical hindsight shows the importance of societal context and of the contributions made by commerce to the formation of socio-economic institutions and business practices. These contributions may be termed the higher order effects whose consequences are more far-reaching for societal development. This paper, given its scope, will not consider the even greater effects of commerce on political, cultural, intellectual, and philosophical dimensions, as evidenced during the Renaissance. It will confine itself to applying insights from history to the study the EC's impact on socio-economic institutions and other macro-level phenomena. The use of history to inform inquiry into the societal effects of technology-related innovations is a rewarding approach adopted by many researchers, e.g. Drucker [1965], Rosenberg [1976], Freeman [1987] and Shapiro and Varian [1999].

### **SOCIETAL CONTEXT**

Thirteenth Century Italy witnessed a community of traders active within a greater society undergoing profound cultural, economic, social and political transformation [Braudel 1985]. The political freedom in Italy was conducive to lively commerce and innovations, and the subsequent societal conditions ushered in the Renaissance [Hale 1993; Roberts 1996; Finer 1997]. The Italian experience is an illustrative case study of how trade and business operated on the basis of existing technology and culture and within the constraints of political conditions.

Traders conduct their business on the principle of making a profit in the process of buying and selling goods. The first order effect of their activities directly promoted efficiency between production and consumption, and indirectly promoted the utilization of resources. Scholars of economic history, however, recognized that the economic repercussions of trading activities went well beyond efficiency in the use of resources in the trading activities themselves [Bauer 2000]. These activities resulted in much more than specific markets for specific products. They helped to create commercial institutions and practices and raise the level of human capital, which proved to be of great utility to the entire economy in the ensuing era of rapid industrialization [Price 1989]. These repercussions or higher order effects result in immense social implication when viewed from a broader and longer term perspective [Bauer 2000]. This phenomenon is also observed to be present in the history of technology [Malone and Rockart 1991].

### **EC IN TODAY'S CONTEXT**

With the benefits of insight from the history of modern commerce, one can study the historical context of EC, and its first and higher order effects. Globalization is the current historical context favouring EC. The emergence of network organizations helped to establish some of the practices

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<sup>1</sup> Commerce or trade existed much earlier than modern commerce whose nascent form appeared in 13<sup>th</sup> century in Italy. Modern commerce gave rise to modern business institutions and practices, which are well documented in studies.

supporting business-to-business (B2B) electronic commerce. The first order effect of EC is the reduction of time and transaction cost, thereby promoting efficiency in the link between production and consumption. Some of the higher order effects already exist, some are still in development while others represent potential institutional changes. This paper discusses the following effects:

1. The release of labour and capital resources from intermediary activities into the production of goods and services, thereby exerting a deflationary effect.
2. The stimulation and fulfillment of an increasingly widespread demand brought on by the wider market open to EC, thereby encouraging expansion in industry and global trade.
3. An increase in inter-dependency among business firms that also creates a demand for rating agencies.
4. Challenges to the logic and assumptions of traditional business models by new business models.
5. The stimulation of businesses to engage in areas hitherto alien to them, thus promising an enhancement of innovative processes.
6. A transformation of the banking sector.

Emergent trends confirm the historical experience that the far-reaching consequences of EC are likely to be at the level of social institutions. History also suggests a need to pay due attention to intervention of socio-institutional structure to reap the benefits of EC.

My approach involves some affinity with that taken by Choi et al. [1997]. They correctly observe that electronic commerce goes beyond the mere adoption of new Internet technology for conducting traditional business practices.

“Electronic commerce operates in a new electronic marketplace where the very players, products and processes are fundamentally changed.” [Choi et al., 1997, p. 463.]

The approach in this paper is different from Choi et al. in that their emphasis is at the micro level such as copyright protection, product choice, and discriminatory pricing while my emphasis is more on the macro level where I look at the effects of EC on existing business institutions and on the formation of new business institutions and practices. My overlap with them lies in the areas of electronic payment systems and business and policy implications of EC.

By its very nature, a new institution does not emerge like Minerva from Jove's forehead. Typically, it is the outcome of countless modifications of earlier practices, made as a result of practical experience. Successful formation of institutions is not merely an armchair exercise. The nature of such a social process implies that we can observe the impacts of EC at macro level only after a time lapse.

The subsequent sections in this paper are organized as follows: Section II reviews, very briefly, some important social and economic consequences of modern commerce. Section III examines higher order effects of EC. The implications of my approach are discussed in Section IV, which concludes the paper.

## **II. INSIGHTS FROM ECONOMIC HISTORY**

The beginning of the last millennium saw an interesting change in Europe. Towns were gradually being transformed from bishops' seats of administration and fortified havens into vital centres of economic life. They also came to play an important role in political development [Lopez 1976; Finer 1997]. When the kingship was powerful, a coherent political system was in effective operation. Where it was weak, the kingdom dissolved into a collection of petty principalities, free cities, and even city republics. Italy was perhaps the most extreme example of the disintegration of such political arrangement. This change proved favorable for cities like Venice, Florence, and Genoa which bloomed and grew to become economic and cultural engines. These cities drove

and expressed new aspirations and ways of thinking directed to material purposes and created new social behaviours. Venice was a great commercial centre, and it was here that banking for the first time separated itself from the changing of money [Roberts 1996]. Florence was the focus of the most intense and influential cultural activity in the whole of Europe. From 1350 to 1450, more scholars, artists, scientists, architects, and poets lived and worked in Italy than anywhere else in the western world. Many of them came from other countries to participate and contribute to that great unplanned historical phenomenon known later as the Renaissance. "Europe went, as it were, to school there." [Roberts 1996, p.193.]

Against this background of intellectual vitality, flourishing commerce brought with it a chain of institutional innovations. The Bill of Exchange appeared in the 13<sup>th</sup> century along with the first bankers. Limited liability was known in Florence in 1408, and marine insurance was available before that [Roberts 1996]. Double entry bookkeeping evolved to meet the needs of merchants [Bodie and Merton 1998]. By 1500, Italians invented new credit instruments for the financing of international commerce. The forerunners of present-day manufacturers were the merchants who adopted and refined the *Verlagswesen* or the putting out system [Heaton 1948; Braudel 1968; Clough and Cole 1968]. The Amsterdam stock exchange was established in the early 17<sup>th</sup> century [Braudel 1968]. The 19<sup>th</sup> century saw the regular market being replaced by continuous trading, purchase by sample, the rise of shopkeeping, and replacement of fairs by produce exchanges or bourses. While commerce exerted tremendous effects on the wider society, it could only operate within the societal framework. For example, it was dependent on what transport technology was available and it functioned within the commercial policies of governments. The development of commerce was both a cause and a consequence of industrialization [Birnie 1952]. Capitalism was conceived and took shape in the womb of trade.

The contribution of traders to the establishment of banks is well documented [Summer 1971; Clough and Cole 1968].

"Banks began when men saw from experience that there was not sufficient money in specie for great commerce and great enterprise." [Summer 1971, p.200.]

In Europe, banks were established in centres of great foreign commerce such as Venice, Amsterdam, Hamburg, and Nuremberg. Financial instruments such as letter of credits and bills of exchange were introduced to meet the needs of commerce. It was

"merchant capital which created markets, financed manufactures, floated the American colonial economies, and launched banking and insurance" [Grassby 1970, p.106].

Even today, we still see the role of traders as modest providers of credit to peasants and farmers in developing countries. In emerging economies, the activities of traders promote not only the more efficient deployment of available resources, but also the growth of resources [Bauer 1991]. Opportunities for exchange provide scope for division of labour and the emergence of different crafts and skills. It may be argued that traders play a role in helping to transform a subsistence economy to an exchange economy. Trading activities are thus productive both statically and dynamically.

Traders were risk-takers who, under the right conditions, underwent a metamorphosis to become financial and industrial capitalists. The instruments of capitalism were invented in the course of turning the wheels of commerce. Two examples are limited liability and the putting out system. The practice of limiting the liability of passive partners made it easier for companies to attract investors to participate in new business ventures. It provided an efficient means for entrepreneurs to pool together public financial resources by selling them shares on the stock exchange. Limited liability is an instrument for sharing risks and profits that proved crucial in the growth of capitalism.

The putting out system was an organizational device used by merchants who identified and seized new economic opportunities beyond their role as buyers and sellers. The system was known to be in full swing in Italy and some other parts of Europe by the 13<sup>th</sup> and 14<sup>th</sup> centuries [Braudel 1968; Clough and Cole 1968]. Under the system, a *Verleger* or wealthy merchant put out work. He provided the artisans with the raw materials and part of the wages, the remainder being paid on the delivery of the product which he then sold. Its distinct features were that work was

done on a large scale by hired labour, that the workers did not own the raw materials and often not even the tools, and that the merchant controlled the whole process from start to finish. This form of outsourcing marked the dawn of industrial capitalism.

Contacts through traders are prime agents in the spread and exchange of new ideas, behaviour, and production methods – a fact in contemporary business, in modern commerce, and in commerce during the dawn of human civilisation [Day 1928]. Early trade opened the first slender means of communication [Mangat 1969]. In the 13<sup>th</sup> and early 14<sup>th</sup> century the most widely copied and read book in Italy was Marco Polo's, where practical information on markets were mixed with the romance of travel [Lopez 1976]. The spread of ideas and information was further promoted by others who travel with traders with the explicit purpose of propagating their faith. Islam was introduced to Southeast Asia as a historical upshot of the commercial activities of the Arab traders. External commercial contacts often first suggest the very possibility of change, including economic improvement [Bauer 2000, p.8].

### **III. LEARNING FROM HISTORY OF MODERN COMMERCE**

Globalization is the most important economic, political and cultural phenomenon of our time [Micklethwait and Wooldridge 2000]. It is a process of social change, characterised by the globalization of markets, a shift towards an economy based on knowledge and information, and the growing importance of technology in everyday life [Castells 2000a, 2000b]. The advent of network organizations provided some of the practices supporting B2B electronic commerce, such as supply chain management, just-in-time sourcing, lean production, and inter-organizational information systems. Network organizations are now common both within and across national borders. Together with trade, capital and investment flow, and migration, network organizations represent one of the defining features of globalization. In the absence of such features, e-commerce as we know it would be very much restricted. For example, if carmakers cannot import car components, there is not much future for Covisint, the e-procurement hub set up by major carmakers.

“Indeed, well-designed trade policies can accelerate the development of electronic commerce, for instance, by removing some of the uncertainty that hangs over it today” [OECD 2000, p.92].

Globalization spurs competition and hence innovation. It speeds up the diffusion of new technology through trade and investment. In its turn, by reducing the cost of communications, IT helps to globalize production and capital markets. EC holds the potential to reduce time and transaction cost, thereby promoting the efficiency in the link between production and consumption. The data available so far suggest a picture of remarkable cost-savings and improved efficiency for firms participating in B2B electronic commerce. For society as a whole, EC constitutes a strong price-deflationary activity because raising prices is harder when your customers can instantly compare them with everyone else's.

From a historical perspective, the more interesting and important aspects of EC are likely to be in its higher order effects. Six of such effects are discussed in the sub-sections that follow. Some already occurred while others are still evolving.

#### **DEFLATIONARY AND OTHER MACRO-ECONOMIC EFFECTS**

Electronic markets affect the consumer purchase process in two ways [Turban et al. 2000]. The first involves the digitization of market mechanisms, reducing customers' search costs in terms of money, time, and effort needed to gather information on price, quality, and product features. The second involves the digitization of information products and their distribution. These cost structure of these products is increasing returns and minimal reproduction costs.

“Digitization also eliminates the need for sellers to maintain an inventory that must be physically shipped to the consumer. A digitized market can be especially efficient

when electronic payment methods will become more widely used.” [Turban et al 2000: 437.]

As labour and capital resources are released as a result of EC and channeled into the production of other goods and services, their overall supply would go up, thereby exerting a downward pressure on prices. Wallis and North [1986] measured the size of transaction costs that go through the market in the U.S. economy, such as costs associated with banking, insurance, finance, wholesale, and retail trade; or in terms of occupation, such as lawyers and accountants. They found that in 1970, more than 45 percent of national income was devoted to transactions. This percentage was an increase from about 25 percent a century earlier. The importance of transaction activities to American business applies to global business too. Modern international business exhibits a high degree of diversification in its production, production processes, and markets.

*“Inter alia, this is revealed by the increasing role of transaction-related business activities. ... In case of single market firm competing in perfect markets, transaction costs are zero. As firms become multi-activity and markets become imperfect, transaction costs assume a greater significance, and, in some cases, the proficiency of transaction-driven activities may determine the success or failure of an enterprise.”* [Dunning 1993, p. 5].

The conclusion to draw from this discussion is significant. Though EC would not reduce transaction costs to zero, it would nevertheless reduce them significantly. Given the pervasive role of transactions, one important aspect of EC is that it will improve the efficiency of all parts of the economy.

Some studies tried to quantify the impact of EC at the macro-economic level. For example, the Australian Department of Communication, Information Technology and Arts [1999] estimated that the net impact could be a 2.7 percent increase in the level of national output. Another study suggests that the rise of B2B e-commerce will, in the long run, increase the level of GDP by 5 percent [Goldman Sachs 2000]. These studies are based on a number of quite restrictive assumptions and their results should thus be read with caution. Figures of these types and anecdotal evidences are not convincing enough to persuade many economists who would prefer to see more evidence before pronouncing this trend permanent [Micklethwait and Wooldridge 2000]. However, OECD reports broad agreement that at least in the United States, Australia, Denmark and Norway, changes in the growth rates of labour productivity are related to significant technological changes [OECD 2000a].

The development of the Internet and e-commerce could also modify some features of the current economic cycle. In one view, e-commerce facilitates more efficient stock management, leading to lower inventories as a ratio of sales and thereby modifying the stock building pattern. Since the late 1980s, inventories relative to sales fell sharply all over American manufacturing. The U.S. Department of Commerce [2000] calculates that this change saved American companies some \$10 billion a year, with a cumulative amount of \$115 billion since 1988. The downside is that without the buffer or reservoir role of stock, any downturn is transmitted more quickly through the whole system. The chairman of the U.S. Federal Reserve Bank, Alan Greenspan, told the Senate hearing in March 2001 that

*“The faster adjustment process does raise some warning flags. Firms appear to act in a far closer alignment than in previous decades. The result is not only a faster adjustment but one that is potentially more synchronized, compressing changes into an even shorter time frame.”<sup>2</sup>*

Here we can see how e-business practice can have profound implications for the business cycle. Moreover, increased price competition in product markets may allow the economy to sustain more jobs without stoking inflation for a period of time. These features work to modify the usual

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<sup>2</sup> Reported in *The Australian*, 24 April 2001, p.37

process of inflation and thus the responsiveness of inflation to the business cycle [OECD 2000a]. Another important development to follow is that by exposing firms to global competition, the Internet might also expedite progress towards implementing product market reforms [OECD 2000a, p.17].

### **POTENTIAL TO CREATE A NEW MARKET**

The wider market open to EC could potentially stimulate and satisfy an increasingly widespread demand, thereby encouraging expansion in industry and foreign trade. Peet [2000] expects a major winnowing of e-commerce firms down to a small number of giants, probably led by those best able to solve the fulfillment problem. This view applies well to companies competing with traditional retailers. But another possibility is just as significant: an opportunity for companies whose competitive edge is specialization.

The global reach of the Internet means that the local neighborhood is not defined by physical geography but by specialty. "For goods and services that can be ordered and delivered over the network, the Internet is truly a global marketplace." [Choi et al 1997:501.] Companies which cannot possibly survive in a major city can do a brisk business serving a world market. New businesses in cyberspace would appear. An example is online publishing of books and journals that would be too expensive to publish in traditional form. Opportunities exist for many smaller competitors providing special interest news and services. Where new businesses depend upon the postal services for fulfillment, the delivery cost is relatively high. The challenge is to develop the market and expand sales. As the volume of such business grows, fulfillment specialists and other services would arise to support them, reducing the delivery costs.

With global B2B e-commerce, worldwide trade information is needed to help organizations improve their global sourcing, procurement, supply chain visibility, order commitment, transportation management, and collaboration capabilities.

EC means 24-hour, 365 days a year availability of services globally. It translates into a skewed advantage for global firms. It will improve the competitiveness of global firms and give customers greater convenience and flexibility. One common strategy to achieve global reach is through merger and acquisition. This strategy, however, may not be the preferred path of the more agile and successful corporations, given the high rates of debacles in cross border merger and acquisition [Micklethwait and Wooldridge 2000]. How firms go about tackling this challenge will certainly be worth watching.

### **INTER-DEPENDENCY BETWEEN BUSINESS FIRMS AND NEED FOR RATING AGENCIES**

Competitive advantage is often gained by integrating supply chain activities at a lower cost than competitors [Kalakota and Whinston 1997]. Increased competition drives business firms to look for cost reduction and efficiency in co-ordination and integration of the supply chain. Isolated business activities such as marketing, material procurement and stock management, manufacturing, and distribution are reorganized to function in tandem. To maximize the efficiency of online procurement, companies must tie together their inventory control systems with web-based exchanges. Online sales need to be linked to order entry systems and customer relationship management. What is important here is that the process of integration is not limited to an individual company, but across all firms in a supply chain – from supplier to customer [Kalakota and Whinston 1997]. Such a trend deepens the co-ordination of processes and the integration of data. The upshot is that a business firm may be conceived as a node in a complex network of business activities. To borrow a term from Hanson [2000], networks can be perceived as a form of social technology.

EC increases inter-dependency among businesses. The level of integration currently seen among network organizations is gradually becoming more common among business organizations. Integration calls for a re-thinking of business ethics. It pays to play fair.

Trading in cyberspace involves risk. Uncertainty is associated with lack of relevant information that matters [Bodie and Merton 1998]. It is similar to the risk early traders in nascent industrial societies faced when they began buying goods produced by strangers. Before the Industrial

Revolution, they bought shoes from the shoemaker whom they knew directly or whom they knew from friends in the community. In the business environment brought on by the Industrial Revolution, they had no such direct knowledge, and brand emerged as an innovation to serve customers' need for identification when buying products made by "strangers".

There are interesting parallels in the new trading environment in cyberspace. For example, rating agencies are in demand to monitor and grade, on a regular basis, the quality of goods and services, and to rate the ability of buyers and sellers to meet their commitments. The electronic market supports an efficient use of information dispersed among economic agents. It provides a concrete example of a rational economic order, as described by Hayek [1945]. He argues that the economic problem of society is a problem of the using knowledge not given to anyone in its totality.

"The peculiar character of the problem of a rational economic order is determined precisely by the fact that the knowledge of the circumstances of which we must make use never exists in concentrated or integrated form, but solely as the dispersed bits of incomplete and contradictory knowledge which all the separate individuals possess. [Hayek 1945, p.519]"

A related need is for some business party to guarantee or insure the quality of products customers are buying, e.g. in electronic auction. The seller needs to be guaranteed that the buyers will pay. A business opportunity is created for banks with global spread, to offer a service that parallels the letter of credit to some extent.

## **BUSINESS MODELS AS INNOVATION**

New business models are challenging the logic and assumptions of traditional models. Though investors and financial traders can argue about the value of Amazon.com, consensus exists in appreciating Amazon's business model as an organizational innovation. Businesses acting as intermediaries between supply and demand of B2B markets would become redundant while demands for services that facilitate the emergent EC would grow.

One of the most important challenges facing organizations in the age of electronic commerce is the development of new business strategies and models. New business models challenge the logic and assumptions of traditional models. Referring to the first phase of electronic commerce, Keen [2001] recalls that the focus was on the technology as the driver:

"Now companies are recognizing that this is about commerce: business models, process/technology integration, service, and relationships [Keen 2001, p.164]."

This view is a manifestation that the new environment presents opportunities for some and threats for others. Indeed, inability to outgrow the dominant, outdated business design and thinking is often what leads to business failure [Kalakota and Robinson 2001]. The pressure is now on companies to function in a state of more or less constant transformation. Senior management must live with the challenges of earning revenues from well-tested practices while being prepared to experiment with new ideas which may undo these old practices. It is in essence a problem described as striking a balance between exploration and exploitation [March 1994].

The last quarter of 1999 and early 2000 saw a lot of excitement in the capital market over dot.com companies. This excitement encouraged entrepreneurs to plunge into starting or expanding EC companies even though investment analysts pointed out the pitfalls of burning money to increase market share. However, it is such investment climates that promote the emergence of new business models. From a longer term perspective, society would benefit even though individual investors may lose their shirts. To paraphrase March [1994]:

Successful organizations build a 'can do' attitude that leads people to underestimate risk. Such attitude is likely to be prevalent in young, apparently successful high-growth firms where the environment conspires to induce investors to believe that they know the golden grail of investment. This risk under-estimation is a way of inducing investment that may prove to be costly to the individuals concerned, but it may end up serving the larger society.

In the light of such developments, we reflect on the future shape of competitive strategy as part of new business models.

- (a) In the world of EC, the barriers to entering business were lowered significantly. New entrants do not need to invest as much time and capital to run their business as did their counterparts in the so-called old economy. They quickly become threats to the incumbents. This change is especially true in information-related or information-intensive businesses e.g. e-publishers. Moreover competition to a company also comes from firms in other sectors; for example, telephone companies can offer services that would encroach in the traditional business of banks as financial intermediaries.
- (b) Critical and demanding customers in the home market were seen as an essential factor in sharpening the claws of competition among companies [Porter 1990]. With EC, especially so for information related products that can be marketed through the Internet, it is not always relevant to refer to the term home market, because the market is global.
- (c) The behaviour of the capital market in the last quarters of 1999 and 2000, and the response of firms to that behaviour reflect the significant influence of the financial market upon business strategy. Given that companies rely more and more on equity capital for funding [OECD 2000b], top managers must be shrewd in formulating their strategy and presenting it in such a way as to boost investors' confidence, or at least to retain it. The relationship between capital market and e-business is a key consideration in such strategy formulation and presentation. This consideration is not easy given the nature of capital market, with all its sentiments, unpredictability, irrationality, and discipline.
- (d) The emphasis on competition and lock-in found in Porter [1980] must be balanced with the language of co-operation, trust, mutual benefit, and openness. An OECD report [1999] spoke of the emergence of openness as a strategy, with many of the most successful e-commerce ventures granting their customers unparalleled access to their inner workings, databases, and personnel. Companies are entering a new ecology of business which demands new business models and new ways of thinking and acting.
- (e) The traditional focus on the individual firm as the competitive unit shifted to the entire supply chain [Gattorna and Walters 1996]. Three factors contributed:
  1. Customers are demanding more varied, often individualized value from the supply chain.
  2. New information technology makes it possible to obtain an overview of the entire supply chain and to use it to meet the demand.
  3. The emergence of global markets and global sourcing stretched these supply chains over inter-continental distances. The time lags at this global scale make the efficient management of these long chains all the more critical.

Timmers [2000] classifies 11 business models that are currently found in the electronic commerce. Some of these models are the e-version of the traditional forms of running a business, while the rest go far beyond the traditional approaches. The innovative ones opt for value chain integration, and seek ways to add value through information management and rich functionality.

“Creating these new business models is feasible only because of the openness and connectivity of the Internet. A consequence of the same open nature of the Internet is that it may be rather difficult to keep the details of a business model hidden. The possibility is not excluded, however, of protecting the intellectual property of a business model by legal means. For example, Priceline.com acquired a U.S. patent in August 1998 for its reverse auction business model [Timmers 2000: 45].”

The story of Abuzz, documented by Kanter [2001], can be read as a story in exploring successful business models.

## **NEW BUSINESS ENVIRONMENT**

Electronic commerce is associated with IT as an enabler, facilitator, and even inhibitor of business activities both within and among all types of organizations [Applegate et al 1996]. EC is thus creating enormous interest in IT as well as many industries [Pan et al 2000]. There is little doubt that growth in this area will continue as more organizations become involved, establishing and cultivating business relationships, performing business transactions, distributing knowledge, and implementing competitive strategy. Corporate life, particularly in America, is being transformed by the Internet [Micklethwait and Wooldridge 2000].

The new business environment ushered in by EC also stimulates businesses to engage in areas hitherto alien to them. As mentioned earlier, telephone companies can become financial companies by allowing customers to pay for goods and services by putting the charge on their bill. With the advent of Wireless Application Protocol (WAP) technology, mobile phones can provide customers with direct access to the Internet. Mobile online shoppers would use their WAP phones to make purchases without a credit card.

The new environment promotes innovation in two ways:

1. EC increases efficiency in the innovative process.
2. By the integrated nature of technological innovations.

### **Increased Efficiency in the Innovative Process**

On the supply side, technology increases the range of choices. On the demand side, adoption patterns are always responsive in ensuring the successful diffusion of the technological potential.

“In many markets the constraining force on technological advancement is not the ability to produce new goods but uncertainty about consumer demand and the rate at which it will eventuate.” [Roberts 2000: 31.]

Two types of management error result from this demand uncertainty:

1. managers launch high-technology failures and
2. managers fail to launch products that would have been successful [Eliashberg, Lilien, and Rao 1997].

The first represents supply for which there is no latent demand, while the latter represents latent demand for which there is no supply. In some instances, such as in the automobile industry, this gap is narrowed by the supplier and the buyer working together in the development of new products. Buyers and suppliers in the industry use computer-aided design technologies across firm boundaries to co-design components [Bensaou 1999]. In other industries, these difficulties can be partly overcome with closer links to a wider market.

One of the strengths of Internet-based e-commerce is that it is based on a global network accessible to all, easy to use, inexpensive and capable of communicating product information to potential customers in over 160 countries worldwide [Barjis & Chong 2000]. However, more openness is needed to narrow the gap separating supply and demand. This pattern is also noticed by an OECD [1999] study on the economic and social impact of electronic commerce. The open strategy of many of the most successful e-commerce ventures led to a shift in the role of customers, who are increasingly involved as partners in product design. What we are in fact witnessing is the penetration of market governance [Williamson 1975] into the whole web of demand and supply. Data capturing experiences and results of using products can be collected and processed to correct flaws in the design, production, and transport stages, a sort of learning-by-using [Rosenberg 1994]. For example, garages in various parts of the world can access the web network designed for them by Nissan and Renault. After repairing and maintaining a Nissan or Renault car, the mechanics use the website to key in the details of the replaced components and of the car, thus providing feedback that the car makers can use to improve the design of their new models.

Perhaps it is time to coin a new term to replace the term supply chain, defined by Christopher [1998] as the network of organizations that are involved, through upstream and downstream linkages, in different processes and activities that produce value in the form of products and services in the hands of ultimate consumers. I would suggest the term “web of supply and demand and innovation”, which is more akin to the dynamic supply webs notion defined by Kumar and Christiaanse[1999] than to Christopher’s supply chain. My formulation nevertheless differs from Kumar and Christiaanse because it explicitly includes the role of web-based e-commerce in reducing wastage and uncertainty in the innovation process.

### **The Integrated Nature of Technological Innovations**

The second effect comes from the integrated nature of technological innovations [Rosenberg 1976; Sahal 1981]. As e-commerce evolves it is likely to follow the ‘reverse product cycle’, in which process efficiency gains are followed by quality improvements to existing products and then the creation of new products.

“Typically it is in this final stage that significant economic growth occurs. E-commerce has the potential to be a platform from which significant new products emerge, many of which will be digital and online. New products have a tendency to beget more new products and processes in a virtuous spiral ...” [OECD 1999: 23.]

### **IMPACT ON BANKS**

Commerce in our age inevitably involves monetary transaction. It would thus come as no surprise that EC could affect banking in a very fundamental way, and would be affected by the ways banks respond to the new demands. For example, it will further undermine the power of bank branches [Lawrence et al 1998]. EC created a demand for low cost facility for micro payments [Choi et al 1997]. Some other areas in which banks can develop e-commerce products are [Wenninger 2000]:

- protection for EC participants against fraud arising from the misrepresentation of identities,
- assistance for small businesses to enter into EC,
- electronic billing services,
- offering firms the technology for business-to-business electronic commerce.

In short, EC may play an active role in transforming banks.

### **IV. CONCLUDING REMARKS**

Studying electronic commerce from the perspective of history allows us to glean new meanings and implications by looking at old facts. Business and management-oriented books are right in pointing out that doing business electronically is not merely buying and selling on the Internet. They argue that business itself is largely a process of information gathering, processing and distribution. Digitising the process makes operations more efficient and would yield higher returns for the firms. My approach looks beyond this. It is alert to changes in the areas of institutions, and the likely implications of EC on business practices, business models, and business cycles. Such perspective can give some pointers for future research. For example, accounting theory as we know it is inadequate in coping with the demands of e-business, and research in this area is likely be both challenging and rewarding. In what ways would widespread adoption of supply chain management affect the volatility of commodities market? Another example is the prospect of the eroding tax base of governments as a result of wide-spread e-business practices; this outcome would result in serious social and political consequences.

Electronic commerce is closely connected with changes in what Freeman [1987] calls techno-economic paradigm. This type of change is characterized by its effects on the input cost structure and the conditions of production and distribution for almost every branch of the economy.

Productivity gains are realized throughout the economy as a result of a process of learning, adaptation, incremental innovation and institutional change. It has been suggested that for a society to reap the full benefits of a technology, there must be a match between the technological system and the socio-institutional setup [Perez 1983]. If the problems of institutional adaptation can be overcome, such techno-economic transformations offer opportunities for new employment-generating investment and labor-saving productivity gains.

“These opportunities arise both in the provision of new and improved consumer goods and services, and in the provision of a new range of capital equipment for all sectors of the economy” [Freeman 1987, p.57].

This view is broadly echoed by the OECD [1999] which sees EC as an economic phenomenon and part of the broader process of social change.

“As both a product and manifestation of such transformations, electronic commerce is being shaped by, and increasingly will help to shape, modern society as a whole. Societal factors will thus have a profound influence on its future development. They will also merit attention from a public policy standpoint, both to establish the social conditions that allow electronic commerce to reach its full economic potential and to ensure that its benefits are realised by society as a whole” [OECD 1999, 143].

This significant shift in the way business is conducted is happening within the new historical context of globalization. Electronic commerce is enabled by, but at the same time enhancing, globalization.

The process of social institutional adaptation on such scale and scope is neither simple nor straightforward. The emergence of new business practices and institutions involves a restructuring of many interests, and it is contingent on a variety of complex societal conditions. To paraphrase Putterman and Rueschemeyer [1992]: Historically, the formation of business institutions represents social innovations of immense significance, based on political, economic, and cultural resources and guided by trial and error in the pursuit of large-scale economic interests. In the process of promoting electronic commerce, key players should tap into existing societal resources and, more importantly, should contribute to the reservoir of societal resources.

This paper aims to contribute to an appreciation of the importance of such process by reviewing the history of modern commerce and to suggest a possible profile of anticipation based on the evolving present.

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