

### Chapter 3

## THE IMPACT OF ELECTRONIC COMMERCE ON FIRMS' BUSINESS MODELS, SECTORAL ORGANISATION AND MARKET STRUCTURE

Electronic commerce is transforming the marketplace by changing firms' business models, by shaping relations among market actors, and by contributing to changes in market structure. Given the dynamic nature of these processes and their firm-, sector-, and time-specificity, it is difficult to single out the impact of electronic commerce. Nevertheless, it is possible to see some emerging patterns, and some conclusions can be drawn from business case studies. This chapter addresses three themes associated with electronic commerce and the organisational changes it entails: changes in firms' business models, changes in market structure, and opportunities for economic growth created by organisational change.

Electronic commerce creates the possibility of new models for organising production and transacting business, by offering intermodality and complementarity – not only substitution – in business models. This chapter begins by looking at the core characteristics of firms entering electronic markets and offers some evidence on the extent to which business models are changing in various sectors. The catalytic role which early adopters can play *vis-à-vis* incumbents in established markets is a key driver of business reorganisation on electronic markets, and the flexibility and adaptability of the work force is a key enabler of this process.

Next, the market structure likely to emerge as a result of organisational changes associated with electronic commerce is examined. The Internet opens up certain proprietary relationships, extends relations between sectors, makes the electronic market accessible to smaller businesses and allows them to address international markets. The nature of competition and firms' strategies and competitive advantages in domestic and international markets also change. Work can be performed from a variety of locations, and firms are exposed to global competition. Several key factors that contribute to the degree of openness on electronic markets – leaving aside the question of disintermediation, which is discussed in Chapter 2 – are analysed. One is the type of Web-based competition that will emerge in each electronic market. Increasingly, new entrants compete to set standards and provide the interface, and Web-based alliances play a strategic role in determining the emerging standard. Online firms also compete to capture customer information, and virtual communities could play a role in striking the balance of market power between consumers and suppliers. Other factors that could counterbalance the pro-competitive effects of electronic markets (see Chapter 2) are: first-mover advantages related to the presence of positive network externalities; national differences in the regulatory environment; and the degree to which the choice of the transaction structure (open or closed) is path-dependent (see Box 3.3 below) and sector-specific.

The final section considers the ways in which organisational changes at the firm level associated with electronic commerce can translate into improved performance and growth at the economy-wide level and suggests a few areas for future research. Because there is evidence that small innovative firms are an engine of growth, it would be valuable to know whether electronic commerce offers small innovative firms any special advantages for entering new or existing markets. Another issue is the nature of the innovation associated with electronic commerce. This point is not often stressed in the literature, but it is extremely important, given the direct and indirect impact of innovation processes on productivity and growth through technology diffusion. Two novel aspects of organisational change and electronic commerce are worth exploring: the role of inter-firm collaboration and networking for successful innovation and the role of customer-supplier relations as a source of technology transfer. An additional interesting line of research concerns whether the combination of new business processes and work organisation associated

with electronic commerce favours high-performance work. There is evidence, in fact, that streamlined business processes, flat organisational hierarchies, and continuous learning and skills acquisition contribute to a favourable environment for innovation and improve performance.

### **Electronic commerce: a new business paradigm?**

Advanced information and communication technologies, together with new networking capabilities, allow firms, from the very large to the very small, to communicate, transact and collaborate at lower cost and with greater ease and flexibility than ever before. This may stimulate noteworthy changes in models of organisational behaviour and lead to the creation of “cyber-traders” and/or virtual enterprises. It is more likely, however, that incremental changes will be made as firms adopt and adapt new technologies to fit their way of doing business. After looking at the core characteristics of firms operating on electronic markets, this section discusses key drivers and enablers of business reorganisation. Annex 3.1 presents evidence on the extent to which business models in various sectors are changing.

### ***New entrants and the evolving business environment***

The so-called “cyber-traders” (see Box 3.1) have garnered a great deal of the attention associated with electronic commerce and the Internet. It is becoming increasingly evident, however, that the attention paid to these companies substantially surpasses their economic significance. Most cyber-traders are consumer retail firms and, while many have achieved remarkable success and high growth rates, their contribution to total retail trade is not quantitatively significant. They have emerged because the electronic marketplace is a good place to experiment with new technologies and new ways of doing business. Whether this is a temporary or long-term phenomenon, however, remains to be seen. Large firms may use the same technologies and techniques and eventually displace cyber-traders, as they will be able to integrate these strategies into their traditional operations and target several niches simultaneously.

While most analysts would agree that cyber-traders are on the fringes of mainstream electronic commerce, many point to what has been termed the “internetworked” enterprise (Tapscott, 1996) as an emerging model in the new information economy. Such an enterprise is characterised by a “virtual” organisational structure, defined as commercial collaboration among firms and individuals carried out in an electronic environment, where entry to and exit from the structure is flexible and determined as needed (Hawkins, 1998). This organisational structure, which often leverages Web-based alliances, can theoretically “harness the power of market forces to develop, manufacture, market, distribute and support their offerings in ways that fully integrated companies cannot duplicate” (Chesbrough and Teece, 1996).

Virtual organisational structures leverage the capabilities and resources of many players to pursue a strategy of risk sharing. There are, however, risks associated with a virtual business structure. Integrated centralised companies, the polar opposite of the virtual firm, do not usually reward risk takers but do have established processes for conflict resolution and co-ordinating all the activities needed for innovation.

#### **Box 3.1. Cyber-traders**

Cyber-traders are businesses without a significant physical presence which operate almost exclusively in cyberspace. Using the new technologies, they typically specialise in niche markets and are highly adaptable to consumer wants and needs. These start-up companies own or control very little of the supply chain or physical production, but they provide convenient service. Many are small operations set up virtually overnight and known only by their Web address. Others, like Amazon.com and CDnow are much larger operations and have become almost household names. CDnow, for example, operates as an intermediary between customers and music distributors, providing fast delivery of compact discs, often within 24 hours. Other firms have emerged that sell new products and services, often centred around Internet or related technologies or the capabilities they offer, including computer products, such as new software programmes and computer-mediated services, and thereby spur the growth of intermediaries.

As a result, firms, and their managers, must often find a balance between incentives and control. Finding the appropriate balance depends on the business activity, the degree of risk that collaborating firms can absorb, and the level of control over information and communication that is needed for the enterprise as a whole to function. Risk increases as firms adopt more “virtual” characteristics and co-ordination through the marketplace becomes increasingly difficult. Control is likely to be more effective under the classical, hierarchical firm structure (Hawkins, 1998).

Accompanying the need for some degree of control within the firm's organisation is the value that firms place on a stable supplier community. Firms value historical experience when selecting partners and, through commercial exchange or collaborative efforts, often develop commercially sensitive information pools with them (Garcia, 1995). These features of the evolving commercial environment (greater risk of co-ordination failures, more difficult governance, sensitive information pools) need to be addressed by policies that focus specifically on commercial governance.

### ***The role of early adopters in new business models***

It is important to ask whether “internetworked” enterprises are truly sources of opportunity within the virtual marketplace and whether Internet commerce should be linked to revolutionary changes in the organisation of business processes and structures (Hawkins, 1998). Some 80 per cent of Australian business leaders believe that e-commerce will drive revolutionary changes in their business by the year 2003 (Andersen Consulting, 1998). Companies convinced of the revolutionary impact of e-commerce tend to be foreign-owned. They operate in various industries, but are not very likely to produce consumer products. A similar survey of European attitudes to e-commerce reveals that European business leaders are more cautious than their Australian counterparts (Andersen Consulting, 1998). Only 43 per cent of European respondents felt that e-commerce offers a real competitive advantage to their company today, as compared to 64 per cent in Australia.

Annex 3.1 offers some evidence of business substitution and indicates the degree to which this implies organisational changes at the sectoral level. In some cases, Internet commerce constitutes the logical extension of firms' business models and simply accentuates some of their characteristics. In others, Internet commerce can mean the adoption of new business models that replace or complement existing ones. In all cases, electronic commerce creates new opportunities and challenges for market participants and offers the possibility of new models for organising production and transacting business. E-commerce thus offers intermodality in conducting commercial transactions and complementarity in business models; it provides an evolving paradigm which can be adapted to the needs of different firms in different contexts.

Even if virtual enterprises do not bring about radical, economy-wide organisational change, it can be argued that leaders who are active in electronic commerce and early adopters of certain forms of business structure can force competitors to adopt a certain type of supplier-customer relationship. In particular, cyber-traders, even if they do not yet seem to represent a new commercial paradigm, are often at the cutting edge of new technologies and innovative market experimentation. Thus, they may play an important testing role for other, more traditional companies.

An example of potential business model “enforcement” concerns Dell and Compaq as suppliers of computer equipment to General Electric (GE) (Ghosh, 1998). GE is setting up a system of Internet bidding and expects to purchase almost entirely over a Web-based bidding system in five years. At present, Dell sells computers directly to customers and expects to handle half of its business over the Internet by the year 2000; Compaq, instead, sells through distributors. It appears likely that Dell's strategy is forcing competitors in the computer industry to develop Internet channels of their own (see Box 3.2).

Early adopters are beginning to emerge in other industries, such as auto retailing (General Motors and Auto-By-Tel) and trade publishing (Cahners and VerticalNet). New intermediaries in personal financial services are likely to require the unbundling of retail banking's integrated business system. Some intermediaries will specialise in creating and managing customer relationships, others in developing new products, and still others in providing back-office processing services and support (McKinsey, 1997). Companies such as Compaq will have to weigh the importance of protecting existing relationships, which account for most of their current revenue, against the advantages of establishing future strategic positions and revenue streams.

Box 3.2. Pirating the value chain: the case of the personal computer industry

Currently, computer manufacturers like Apple, Compaq and IBM purchase computer components from suppliers like Intel (microprocessors) and Seagate Technology (hard disk drives). Manufacturers supply machines to distributors such as Ingram Micro and MicroAge, which in turn supply retailers such as CompUSA. This is the physical value chain for much of the industry (excluding manufacturers such as Dell and Gateway 2000, which sell directly to customers). Internet commerce is blurring the boundaries in that chain. Ingram Micro and MicroAge are setting up Internet-based services that would allow anyone to become an online retailer of computers. At the same time, retailers like CompUSA are establishing their own brands of computers, which they intend to sell both in stores and over the Internet. They will order parts electronically from component suppliers. Finally, Apple and other computer makers have also made the choice to sell computers over the Internet.

Competition is even coming from outside the value chain. United Parcel Service has announced that it is setting up a service for virtual merchants. Using Internet software, a merchant can create a product catalogue and a storefront on the Web. UPS will then manage the operations. The merchant or its customers will be able to schedule deliveries, track packages and co-ordinate complex schedules over the Web. Conceivably, an online PC vendor could let consumers create customised machines, made up of components drawn from several different manufacturers. UPS would then gather the parts overnight, deliver them to an assembly facility, pick up the assembled product, and deliver it to the customer.

Online providers of information about computers, such as CNET, are already becoming resellers of software and hardware products. The Internet search service Yahoo! also sells hardware and software through its site by linking seamlessly to partners' sites. Even ancillary players in the industry value chain – including banks like Barclays and First Union, and telecommunications providers such as AT&T – have established shopping services on their sites and could sell computers (or anything else) to their customers.

Source: Adapted from Ghosh, 1998.

Although early adopters may be in a position to define new business models, in which case the impact on business-to-business relations could be large, the process is not so simple. It would be fatal for firms to try to adjust business models to technologies unless there is a clearly defined strategic rationale for doing so. Companies that stand to lose margin to others currently provide real value to customers in the form of merchandising skills (which Ingram Micro does not have but CompUSA does), logistics expertise (which CompUSA does not have but UPS does), and information management (which CNET can do better than Apple) (Ghosh, 1998). One interesting case concerns IBM, which in 1996 launched Informat, an electronic-content delivery initiative, and World Avenue, a cyberspace mall (Ghosh, 1998). IBM thought it could use its computer network to deliver content and challenge the physical distribution chain, but it soon realised that it lacked the editorial and circulation skills of publishers and the merchandising and advertising skills of retailers. As a result, both initiatives were abandoned in the following year.

In the case of business-to-consumer electronic commerce, which has not yet reached critical mass, it may be very risky for a company to bypass distributors and to have to weigh the gain of a few Internet customers against the loss of a large number of traditional ones. The degree to which producers are able to impose their desired channels depends in fact on various factors – e.g. institutional, social, subjective – and a variety of path dependencies.

It would be interesting to know in which sectors early adopters are most likely to enforce their business models and where conflicts involving transaction channels are most likely to occur. It is possible that enforcement of new business models might be more frequent in industries where switching costs are low or where costs are lowered by adoption of information and communication technologies (ICTs). When Federal Express (FedEx) launched its Web site (November 1994), which allowed customers to track packages on the Web, UPS (United Parcel Service) accelerated its development efforts, and launched a similar service six months later. Today, both services are functionally very close. The third major competitor (DHL) made a similar service available in 1996 (Bloch *et al.*, 1996).

### **Key enablers of business re-engineering: workers and innovation**

Becoming virtual implies substantial organisational adjustment. The virtual enterprise is a “real-time” enterprise that must adjust immediately to changing business conditions. A key enabling factor in business re-engineering is the flexibility and adaptability of staff. Much organisational learning and adjustment will be required from workers in the electronic commerce environment and new skills will have to be developed (see Chapter 4).

The virtual enterprise will be characterised by flatter hierarchies and a team-based work organisation so as to respond more quickly to changes in the business environment and customer demands. Because electronic markets have the power and capacity to open channels of human communication and collaboration dramatically within an office, across space, and across time, collaborative work increasingly takes place in teams on high-capacity networks (Tapscott, 1996). Horizontal collaboration in independent team-based structures is replacing traditional vertical hierarchies. In the new model, teams are both clients and servers for other teams that are both internal and external to the organisation.

The value added created by these teams is not linked in linear fashion but generated through an ever-changing open network. The model is designed to encourage flexibility, innovation, entrepreneurship and responsiveness. As an example, the Boeing 777 is the first aircraft to be designed without physical models and blueprints. It was designed by teams and involved customers and suppliers in a workgroup design system and was engineered concurrently, thereby reducing development time dramatically. It was also tested in various performance situations and weather conditions several times prior to production (Tapscott, 1996). To the extent that electronic market players pioneer or are forced to adopt these flexible forms of work organisation and combine them with new and streamlined business processes, electronic commerce will favour high-performance work (see below).

In this evolving business environment, market actors need to innovate continuously and perhaps differently than in traditional markets. As a trading environment, electronic commerce is unique in providing unparalleled opportunities to capture, manipulate and manage all the information generated in a transaction. This helps improve business planning, efficiency in production and distribution, and vendor and customer support. This is “efficiency” innovation and it diffuses very rapidly.

The Internet has also provided an extremely challenging environment for flexible product development, one that allows designers to continue to refine and shape products even once they are on the market (Iansiti and MacCormack, 1997). Designers can sense customer needs (either by broad consumer testing, internal testing or testing by lead users), test alternative technical solutions, and integrate the acquired knowledge into a coherent product design.

### **From proprietary to open networks: the impact on sectoral organisation and market structure**

As a standardised system accessible to all at minimum cost, the Internet takes over at the point where proprietary systems reach the limits of their possibilities.<sup>1</sup> The Internet extends the benefits of EDI to all of a firm's suppliers, opens up certain proprietary relationships, extends relations between sectors, makes the electronic market accessible to smaller businesses and allows them to address international markets. The shift to standardised networks also contributes to the shortening of the product cycle, improves procurement procedures, and affects transaction costs between producers, intermediaries and consumers differently (see Chapter 2). This in turn lowers entry barriers and creates greater incentives to enter the market, thereby generating competitive effects. The result is an expanding market, more transactions and more providers. Thus, as there is a shift in the use of the electronic link, there may also be a change in an industry's market structure.

Electronic commerce is changing the way firms compete and market players interact, as well as changing the size and nature of the marketplace. The following discussion starts by examining changes in the competitive behaviour of firms involved in electronic commerce on domestic and international markets. It then turns to changes in the size of the market and the open and global nature of electronic commerce. It considers the emergence of virtual communities as a factor that can affect the relative strength of market players. Finally, it presents factors that might counterbalance the competitive effects stressed in Chapter 2, such as: first mover advantages related to the presence of positive network externalities;

international differences in the regulatory environment; and the degree to which the choice of the transaction structure (open or closed) is path-dependent and sector-specific.

### ***Internet commerce and the changing nature of competition***

Key factors for competing in online markets include the ability to create strong brand recognition, to build user communities and attract advertising, to provide ease of use, variety of value-added services, functionality and features and quality of support, to establish strategic alliances and to expand on international markets. Key features of competition in electronic markets are the entrance of non-industry competitors and the spread of Web-based strategies focused on setting dominant standards and making strategic alliances.

#### *The emergence of non-industry competitors*

Apart from incumbent firms in established sectors and new start-ups, new competitors in online markets are often companies or new intermediaries coming from other sectors, e.g. software companies. Microsoft, for example, is positioning itself to become a trusted intermediary in retail banking. Its platform includes leading players in each product segment of retail banking, e.g. Schwab and Fidelity for mutual funds, E\*Trade for online trading, CheckFree for electronic payments, and over 50 major banks for credit and transaction products (McKinsey, 1997). In another example, Amazon.com purchased (4 August 1998) two Internet start-up companies, one providing a Web-based virtual database technology shopping service and one providing a Web-based address book. Through these acquisitions, Amazon hopes to evolve from an online bookseller to become an Internet commerce hub, like Yahoo! and other Web portals. In so doing, Amazon could come into conflict with sites such as Yahoo!, which it now pays to send it traffic (Robert D. Hof, San Mateo, California).

The ability of non-industry competitors to take over a significant part of the business of incumbent firms should not be underestimated. Killen & Associates (1996) estimate that in the banking industry 25 per cent of the global electronic payment market will be taken by non-banks and high-technology companies (Bloch *et al.*, 1996). In the pharmaceutical industry, the emergence of HMOs (health management organisations) and other intermediaries between customers and suppliers has reduced the share of customer value going to manufacturers from 67 per cent to 60 per cent (Bloch *et al.*, 1996). Charles Schwab, by offering convenience (24-hour access, a single statement), extensive information and advice (SelectFunds list, software), range of choice (1 200 mutual funds) and low price (half of the funds are no-load, no-fee), has already captured 50 per cent of US online trading in mutual funds (McKinsey, 1997).

#### *Competing on standards and the first mover advantage*

At this stage, everything that constitutes a market – products, industrial structures, trade and competition rules, regulations and laws – is in the process of being defined on the Internet. The first aim of players entering the new market is to influence these elements in their favour, by proposing and helping to select innovative products that fit their technological options, by segmenting the market to suit themselves, by helping to define the ground rules (recommendations, proposed organisation, standardisation, etc.).

Web-based competition is often driven by three types of strategy. One involves setting the dominant technology standard. In the computer and multimedia industries, for example, Novell has become a standard for local area networks, while Netscape is trying to build a platform for electronic commerce. Second, firms increasingly compete on acquiring customer information. In customer Web sites, the platform is shaped around detailed customer information (e.g. Microsoft and Intuit in financial services). Such information is used to find new customers more efficiently, improve products and services or tailor them to individual needs, and build loyalty. Companies that use customer information to provide value added to the customer are positioned to gain access to more customers (Hagel and Rayport, 1997).

A third strategy involves segmenting the market and exploiting a niche. Market Web sites are organised around a narrow product category, with Web shapers developing a market for transactions and aggregating a critical mass of players (e.g. Schwab's OneSource and InsWeb) (McKinsey, 1997). The development of niche markets in intangible products with high information content may contribute to the

development of dominant long-term positions on electronic markets. The greater the information content of a product, the easier it is to buy and sell via a network. Financial services, for example, are pure information products (*i.e.* they are based on the gathering and analysis of information), and even transaction services may be reduced to a set of entirely electronic accounting entries. This is why financial services are becoming the biggest market for electronic commerce, both business-to-business and business-to-consumer. Moreover, as the Internet is not yet a mass market, the “high-tech” profile of Internet users has a strong influence on business-to-consumer offerings. These factors are important, since they show areas in which growth niche markets in electronic commerce can be found.

It is often important to be first movers and fast adapters in the online environment, especially in relation to establishing a brand reputation, to defining standards and to exploiting new markets. Electronic markets are characterised by the presence of positive network externalities. Positive network externalities are features of all products, but in particular of network information technologies (Katz and Shapiro, 1985). The first player to enter an electronic network benefits from positive network externalities on a global scale and can very rapidly acquire an edge in terms not only of information (global reputation of certain brands) but also of economies of scale and stature (price advantage). The lack of transaction security owing to technical or legal problems amplifies the effects of reputation and communication.

Although the Internet is a naturally open environment, the nature of Web-based competition may, in certain cases, favour the emergence of dominant positions on electronic markets. The aim of public authorities in this context is both dual and ambiguous. On the one hand, they need to take advantage of such dominance to spur the market, and on the other, they need to reduce the risk of abuse of this power by helping to ensure that the market is open to as many players as possible.

#### *The role played by strategic alliances*

Web-based strategies follow the assumption that the best way to handle risk is to share it by leveraging the capabilities and resources of many players. While strategic alliances are nothing new in the business landscape, Web-based strategies pursue alliances that are different from conventional ones in at least three respects: they involve a much larger and more varied group of companies; they rely on much more informal business relationships and co-ordination mechanisms than the usual detailed legal arrangements; and they require leadership by one or two companies to define standards for all Web members and create incentives that attract more companies to it (McKinsey, 1997). A wide resource base and risk spreading often make these players pursue more aggressive strategies than traditional actors.

International strategic alliances, typically joint ventures, as well as direct acquisitions and licensing agreements, are a common way for online firms to expand on international markets (see the example of

Table 3.1. **E-commerce firms' presence on international markets**

Company	Percentage share of on-line revenues (1997)	International alliances and acquisitions	Markets
E-Trade	63%	Nova Pacific Capital (Australia), VERSUS Technologies Inc. (Canada)	Australia, New Zealand, Canada
Schwab Charles Corp.	37%	Charles Schwab Europe, 1995 (UK)	Europe
CDnow		Lycos Bertelsmann GMBH & Co AG, 1998 Rolling Stone Network	Some European countries World
		Wholly-owned subsidiary in Japan Shinseido Inc. (Japan)	Japan
Music Boulevard (NK2)	100%	MSI (Netherlands)	Europe
		MTV Networks	Europe, Brazil, Japan, Asia
Amazon	100%	None	

Source: OECD, based on data from the US Securities and Exchange Commission.

online brokering in Annex 3.2). Table 3.1 provides some recent examples of ways in which US e-commerce firms expand on foreign markets.

*“Virtual” communities and the shifting balance among market actors*

Electronic commerce is expected to affect relations among actors in the marketplace. Changes in the value chain and the entry of new actors work in this direction. Electronic commerce as a mechanism for delivering information also affects market players, as information can determine their relative bargaining power. With the growth of information-intensive electronic transactions, firms start competing on “information content or quality” instead of prices or quantities, and problems of asymmetric information and asymmetric access to the electronic link become more relevant.

However, these drivers of change are not different from those associated with the spread of information technologies. The novelty of electronic commerce lies in the emergence of virtual communities that can play a role in reshaping market structure. Such communities might eventually set in motion an unprecedented shift in power from suppliers to consumers, as they can provide new sources of customer information (a crucial element of Web-based competition, see above). As communities bring together customers with shared interests and characteristics, the profiles they create will yield rich data sets about both individuals and customer segments (Hagel and Armstrong, 1997).

Companies are increasingly adopting electronic commerce solutions in the hope of developing new markets. The key to exploiting new markets involves combining content and communication, and virtual communities can play a powerful part by acting as catalysts and creating the “critical mass” needed for business-to-consumer electronic commerce to grow. For example, they could help expand the reach of very small and localised producers by helping them to market their products at a very low price, or they could create new demand by stimulating interest in new products and by diffusing information.

***Changing the size of the market: competing globally***

With the Internet, electronic commerce is rapidly expanding into a fast-moving, open global market with an ever-increasing number of participants (Beltz, 1998). The open, and potentially global, nature of electronic commerce is likely to increase market size and change market structure, both in terms of the number and size of players and the way in which players compete on international markets. Digitised products can cross the border in real time, consumers can shop 24 hours a day, seven days a week, and firms are increasingly faced with international online competition. But how large and global is the market?

*How large is the market?*

The Internet is helping to enlarge existing markets by cutting through many of the distribution and marketing barriers that can prevent firms from gaining access to foreign markets. Many small and medium-sized firms (SMEs) are using the Internet as a “business-to-business” tool to open and/or maintain a presence in foreign markets. Internet-based e-commerce’s potential to facilitate SME access to global markets is illustrated by several case studies in the report, *Putting Australia on the New Silk Road* (Australian Department of Foreign Affairs and Trade, 1997). Electronic commerce lowers information and transaction costs for operating on overseas markets and provides a cheap and efficient way to strengthen customer-supplier relations, through electronic e-mail, remote online databases and video links. It also encourages companies to develop innovative ways of advertising, delivering and supporting their product and services.

Internet-based electronic commerce is also creating new opportunities for trade by radically changing delivery models for digitised products and services. The best example is that of electronic software distribution (ESD), *i.e.* transmission of software over the Internet. Even if ESD is still limited, its potential in the rapidly growing area of international trade in software may be significant. Among the major distributors of software over the Internet, those with international customers seem to export more than one-third of their product (OECD, 1998*d*). Other services, from financial services to education to medical services to others yet to be devised, all have the potential to become more globally traded.



While electronic commerce on the Internet offers the potential for global markets, certain factors, such as language, transport costs, local reputation, as well as differences in the cost and ease of access to networks, attenuate this potential to a greater or lesser extent. For example, because automobiles are manufactured, expensive, non-standard products requiring after-sales service, they are not traded electronically world-wide. The case of financial services is diametrically opposed. Trading (order, payment, delivery) is carried out entirely over networks. The case of information products, such as software, films, research, etc., might be the same. At present, books and recorded music lie somewhere between the two, as the products are inexpensive, can be delivered by mail at low cost, and require no after-sales service. It may therefore be cheaper to buy a book at Amazon.com than from a bookstore or from the virtual site of a national firm. Annex 3.2 presents estimates and evidence on the extent to which certain goods and services have an online international market.

### *How global is the competition?*

On traditional markets, firms seeking to compete with a firm with a global presence will first lay the groundwork on a smaller geographical market where they will test their products and build brand recognition and reputation. The existence of geographical and time barriers shields the local development of multiple players. In addition, these barriers limit players' ability to exploit economies of scale. On the contrary, as markets on the Internet have no geographical boundaries, a new entrant cannot, in principle, take advantage of a geographical niche or use a neighbouring market as a springboard. The only neighbouring markets that can serve as a springboard are product markets (e.g. a firm might add music publishing to book publishing). This is why the current trend is for existing network players to extend their market and globalise their offer. The characteristics of information networks and the related technologies enable these firms to occupy the ground, geographically and quantitatively, to an extent not before possible.

However, the Internet is far from being a truly global market at this stage, as the United States accounts for about 80 per cent of world-wide electronic transactions (see Chapter 1). Being a first mover on foreign markets can be especially crucial for completely new entrants (as opposed to companies that already conduct off-line activities in the sector), and cyber-traders may be using foreign markets as springboards. Table 3.2 shows the trend in international revenue share of three new entrants. For all three, international revenue shares have been declining over time and Amazon.com and CDnow expect shares on international markets to decrease because of increased domestic marketing and advertising expenditure. It is possible, then, for international markets to function at the moment as niche markets for start-ups that otherwise face greater competition at home. Once these have established a certain brand reputation and expertise, they may then reinforce their position on domestic markets (especially if the domestic market is larger).

### *Changes in the source of international competitive advantage*

As electronic commerce develops internationally, changes in delivery channels are likely to affect firms' relative competitive advantage on international markets. The ultimate impact on trade flows will depend on relative prices, inclusive of transaction and transport costs and duties (relative cost structure); on consumer access to and willingness to use online markets (critical consumer mass); on brand recognition and "closeness" to the local market. The ability of online retailers to track individual customer purchases and demo-

Table 3.2. **On-line revenues: percentage share of international markets**

Company	1998	1997	1996
CDnow	21	35	
Music Boulevard	26	33	
Amazon	21	26	35

Source: OECD, based on data from the US Securities and Exchange Commission (CDnow: March 1997 and 1998; Music Boulevard: September 1997 and April 1998; Amazon: September 1996 and 1997, March 1998).

graphic data for use in direct marketing and in developing one-to-one relationships with consumers is likely to reduce the competitive advantage of firms present on local markets. An important part of online firms' strategy is to address foreign markets. N2K, for example, offers registration and ordering instructions on Music Boulevard in English, Japanese, German, French and Spanish and has also launched a complete Japanese version of Music Boulevard (Edgar database, US Securities and Exchange Commission).

Insofar as e-commerce reduces production and transaction costs (see Chapter 2), transport costs will have greater weight in firms' relative cost structure and location decisions. Hence, firms which enjoy a greater competitive advantage in online markets (typically US firms) might still tend to establish a physical presence on foreign markets through foreign direct investment (FDI). Transport costs might instead completely lose relevance in the case of digitised products (such as software or music) which can be delivered electronically over the Internet. In this case, various stages might be envisaged. First, the development of online markets in Europe might shift European consumer demand towards those markets (because of convenience, choice, etc., as transport costs are modest within Europe). This would change relative market shares within Europe (European firms and non-European companies based in Europe that are first on the online market are likely to acquire a first-mover competitive advantage). Second, as electronic delivery will become the predominant channel for delivery, transport costs will be eliminated. At that point, companies are most likely to fully exploit their competitive advantage in online markets regardless of their location.

### **How open is the market structure?**

Even if the growth in transactions over the Internet is leading to greater competition, it is not clear that there is a direct relation between the adoption of open links and open market structures. Statistics on the growth of intranets show that the commercial development of the Internet may be as much about creating essentially "closed" spaces in an open environment as it is about creating a universally open trading space (Hawkins, 1998). On the one hand, as discussed above, the use of electronic networks as a marketplace might help to create dominant positions in the long term. On the other hand, there may be path-dependent, sector-specific strategies that favour closed rather than open structures.

Firm and sectoral strategists face a wide diversity of existing and/or potential transaction structures when planning electronic commerce applications. Different transaction structures reflect the diversity of industry and market structures, product characteristics, and buyer and seller expectations (Hawkins, 1998). Much of this diversity is determined by the various evolutionary path dependencies (see Box 3.3) established in different business areas over time. Production dependencies (the choice of an electronic network depends on the specific nature of the transaction), market and strategic dependencies (the use of a specific network might increase the cost of switching to a different one and might favour market power), and environmental and institutional dependencies all influence the choice of the network, and this in turn might have an impact on industry's organisation structure.

#### **Box 3.3. Path dependencies**

A firm is a set of competencies embedded in its staff, its organisation and its techniques, most of which are inherited from the past. The term competencies refers to all of an organisation's capacities, including its managerial capacities and its functional skills (financial, commercial, technical and productive) (Ansoff, 1988). It therefore covers not only expertise and knowledge but also equipment, know-how, collective and institutional learning, patents and protected technologies, access to raw materials and components, relations with customers and suppliers, modes of production and information management, modes of organisation and corporate culture. These competencies, specific to each firm, may be explicit or tacit. They represent both a potential for and a restriction on growth (Nelson and Winter, 1982) and are what Arthur *et al.* (1987) call path dependencies.

The literature shows that there is a whole range of outcomes in computer-mediated business relationships. For instance, financial information services, previously disseminated via proprietary systems, such as Reuters, Dow Jones Market (Telerate), Knight Ridder or Fininfo, are now – to some extent at least – available on the Internet. The shift from proprietary systems to standardised networks has opened up the electronic network market to new actors such as newspapers, brokers, and individuals. The transaction structure is more of a hybrid, with new players (e.g. Briefing, Quote.com) and traditional vendors offering new services that compete with traditional ones. Most financial markets still sell their information to specialised intermediaries via proprietary connections, and, in most cases, the Internet sites are merely showcases. Some financial services are still available exclusively through proprietary systems. They are either innovative services requiring dedicated systems, or services requiring the high security and confidentiality that proprietary systems offer.<sup>2</sup>

For firms in supply and production chains, instead, the logical endpoint could well be smaller, less open structures rather than expansive open ones. In the upstream production-oriented part of the automobile industry, for example, electronic communications have a productive function as well as a commercial one. The former is particularly important for the definition of electronic links. It presupposes first, that some traded inputs are specific and the information relating to them is dedicated and secret and, second, that the components' flow is integrated into the production cycle. Since in this industry such flows are just-in-time, relevant information flows must be reliable and fast. This is why some data exchange systems will remain proprietary. Correlatively, transactions that are remote from the productive function and from just-in-time flows can be executed on open networks. The advantages of doing so are all the greater in that manufacturers can benefit from the competition among a maximum number of suppliers.

### **Electronic commerce and organisational change: channels for performance and growth**

This section discusses the ways in which organisational changes at the firm level that are associated with electronic commerce can translate into improved performance and growth at the economy-wide level. The role played by electronic commerce in this respect offers important areas of research which are not yet covered in the literature. Because there is evidence that small innovative firms are an engine of growth, it would be interesting to examine whether electronic commerce gives small innovative firms any special advantages for entering new or existing markets. Another issue is the nature of innovation associated with electronic commerce, a point that is usually not stressed in the literature on the latter but is extremely important, given the impact that innovation processes have on productivity and growth, both directly and indirectly, through technology diffusion. There is also the question of whether the combination of new business processes and work organisation associated with electronic commerce favours high-performance work.

#### ***Does electronic commerce give smaller innovative firms special advantages for entering new or existing markets?***

Basically, two types of firms enter electronic markets: start-up firms directly conceived to operate in this environment and established firms that migrate to electronic commerce. The economic significance of start-up firms is very small but is growing fast. Established firms adopt electronic commerce solutions at various rates and along industry-specific paths (see above). It is the “scalability” of the Internet that offers small niche players many of the same advantages enjoyed by large diversified firms in terms of expanding the range of e-commerce customers and transactions (Hawkins, 1998). This may be particularly important for small innovative firms trying to enter the market.

The problem of asymmetries in firms' abilities to control the terms of entry into and exit from the electronic marketplace is another SME-related issue that could be worth exploring. As large firms embrace e-commerce, more small firms are being compelled to follow to be able to do business with larger firms. These and many other factors can make opportunity costs relatively greater for SMEs than for large firms.

#### ***The role of electronic commerce in innovation processes and technology diffusion***

Firms adopting electronic commerce often invest in research and development (R&D) for information and communication technologies. Reuters, a \$5 billion global financial news and information company, has substituted a “high-value-added, real-time online business information services” business model for much of its traditional “news agency” model. In the process, it has become a major investor in R&D for ICT prod-

ucts and services (Hawkins, 1998). For example, it is investing in pay-per-view technology and a smart card that will allow Reuters subscribers to access services from anywhere in the world via the Internet (Margherio *et al.*, 1998). In 1997, the firm had the ninth largest overall R&D spending in the United Kingdom, more than that of British Aerospace or British Petroleum (Hawkins, 1998). Table 3.3 shows the amount of operating and development expenditure (inclusive of R&D expenditure) for three well-known cyber-traders.

By adopting information technologies, the mechanism of innovation changes. R&D breakthroughs seem to become the outcome of a series of many small innovations, rather than a single big one. Wal-Mart's and Bennetton's successful inventory strategies seem to have been built in this way. The future of R&D in business might be to move away from the hard sciences and technologies towards understanding consumers' demand patterns, self-organising structures, supply chains, markets, organisations and their behaviour (Forge, 1995).

Focused innovation is not only conducted at the R&D stage but carries over to implementation and marketing. The success of the Sabre reservation system lies not only in the technology but also in its marketing, as it is presented as a separate company to attract other airlines (Forge, 1995).

Innovation and technology diffusion lie at the heart of economies' growth processes. Recent OECD work (OECD, 1998b) points to the role of ICTs and organisational change in innovation and technology diffusion (see Box 3.4). The extent to which electronic commerce plays an independent and sizeable role in overall changes in the innovation process is still extremely limited. Nevertheless, the increasing role played by networks (Internet and intranets) in the innovation process constitutes a channel through which electronic commerce can stimulate successful innovation. Manufacturers of Internet equipment are heavy investors in R&D. As Table 3.4 shows, R&D expenditures in US companies have been increasing at an average rate of 55 per cent a year.

What is unique about these technologies is the system-wide gains in efficiency they achieve as they link different actors in a wide cross-section of industries. Fostering such system-wide improvements requires rethinking technology and innovation policies, such as technology diffusion programmes, which tend to focus on a single industry, such as manufacturing, whereas services such as wholesale trade, transportation and retail trade make the largest contributions to system-wide gains. This suggests the need to broaden the notion of "innovation" to include consumer goods and services (OECD, 1997c).

Electronic commerce may also play a role as a source of technology transfer via customer-supplier relations. These, together with the purchase of equipment and the hiring of skilled personnel, are by far the most important source of technology transfer in many countries (OECD, 1998b). In many of the cases examined above, direct links established between customers and suppliers can create a valuable technology/innovation channel.

Table 3.3. Net revenues/sales and operating and development expenditures for e-commerce firms

US\$ thousand

Company	Country	Net revenues/sales <sup>1</sup>				Operating and development expenditure <sup>2</sup>				Operating and development expenditure as a percentage of net revenue/sales		
		1996	1997	1998	CAGR %	1996	1997	1998	CAGR %	1996	1997	1998
Amazon	United States	16.01	87.73	448.1		1.58	6.73	327.2		9.84	7.67	
CDnow	United States	2 600	10 000	284.6		322	1 100	241.6		12.38	11.00	
N2K	United States	1 656	11 263	57.0		7 955	14 852	86.7		480.4	571.2	
E*Trade	United States	51.60	142.74	176.6		2.79	10.76	285.4		5.41	7.54	

1. Amazon and CDnow: percentage of net sales (March); E\*Trade: percentage of net revenue (September).

2. Expenses for store management, design, development and network operations personnel, systems and telecommunications.

CAGR = Compound average growth rate.

Source: OECD, based on data from the US Securities and Exchange Commission.

Table 3.4. **Revenues and R&D for manufacturers of Internet equipment**

US\$ million

Company	Country	Revenues				R&D expenditure				R&D as a percentage of revenue		
		1995	1996	1997	CAGR %	1995	1996	1997	CAGR %	1995	1996	1997
3Com	US	1 404	2 057	2 093	22.1	145	214	270	36.3	10.4	10.4	12.9
Bay Networks	US	2 233	4 096	6 440	69.8	211	399	698	82.0	9.4	9.7	10.8
Cabletron Systems	US	833	1 100	1 407	29.9	89	127	162	34.7	10.7	11.6	11.5
Cisco Systems	US	1 593	2 327	3 147	40.5	166	233	335	42.0	10.4	10.0	10.7
Total		6 063	9 580	13 087	46.9	612	973	1 465	54.8	10.1	10.2	11.2

CAGR = Compound average growth rate.

Source: OECD (1999, forthcoming).

**Box 3.4. Changes in innovation and technology diffusion processes: the role of ICTs and organisational change**

**The process of innovation and technology diffusion is undergoing substantial change**

The main driving forces are increasing market pressures (stemming from globalisation, deregulation, and changing patterns of demand and new societal needs), as well as the increased use of ICT technologies (which can increase multi-disciplinary production of new knowledge and diminish the cost of information access and processing).

In this new mode, technology diffusion involves much more than the mere purchase of advanced equipment. Genuine innovative efforts, such as organisational and managerial changes, are often required to exploit fully the potential of new technologies.

**Innovation has become a complex activity, involving many different types of knowledge and actors**

Smooth interplay among actors is essential for successful innovation. Inter-firm collaboration, networking and the formation of clusters of industries are examples of such interaction. To reinforce their innovation competence, many firms are investing heavily in new ICTs and increasingly in "intangibles" (e.g. skills and qualifications, purchase of technologies and know-how, and organisational restructuring in order to realise the potential of the new ICTs).

As regards external links, the number of actors involved in the process of innovation is increasing (e.g. enterprises large and small, universities, public and co-operative research labs, hospitals). There is also a widening variety of types of interactions (user-producer interactions, outsourcing of R&D, formation of R&D alliances and research joint ventures to pool resources, formal and informal links to the scientific community, etc.). Firms are more likely to innovate successfully if they are able to access and implement acquired knowledge rapidly. This accounts for a positive relationship between internal innovation capabilities and the use firms can make of external linkages. Firms with higher internal innovative efforts also have a greater ability to co-operate with other actors and to adopt knowledge produced outside the firm.

**"Networks of innovation" have become the rule**

The development of intranets and the Internet favours networking of the economy and may change the relative importance of sources of information for innovation by firms. Intranets favour the diffusion of information within the firm and the Internet will certainly increase links with research institutions and universities.

Networking has also become an effective innovation technique in its own right. Indeed, some authors argue that networking must now be considered as powerful as hierarchy and the market as a co-ordination mechanism. Empirical studies have confirmed that collaborating firms are more innovative than non-collaborating ones. Even non-collaborating firms do not work in isolation, but are involved in a number of interactions: they purchase embedded technologies, consultancy, and intellectual property and scan for ideas from a variety of sources.

Source: OECD, 1998b.

### ***The high-performance workplace and its impact on productivity***

There is evidence that firms and establishments adopting new organisational structures have stronger and more productive external linkages with their customers and their suppliers of inputs and services (OECD, 1996*b*). Moreover, the combination of streamlined business processes, flat organisational hierarchies, and continuous training and skill acquisition constitutes a favourable environment for innovation and improved performance. Firms' strategies based on these elements are often termed "high-performance work practices". At least some, if not all, of the features of the new work organisation (OECD, 1998*b*) have much in common with the features of enterprises in electronic markets:

- more horizontal inter-firm links for subcontracting or outsourcing;
- the new work organisation is an essential complement to effective use of technology;
- flatter hierarchies;
- better use of better trained and more responsive employees;
- more multi-skilling and job rotation, blurring differences among traditional work activities;
- more small self-managing or autonomous work groups which take more responsibility.

A series of recent surveys (OECD, 1998*b*) shows that organisational flexibility associated with high-performance workplaces has a positive impact on firm and establishment performance. In particular, high-performance workplaces are associated with: *i*) higher labour productivity, better wage performance and satisfactory unit cost performance; *ii*) higher sales owing to increased market shares, customer satisfaction due to better product quality and improved customer relations; and *iii*) positive employment performance (particularly in association with technology adoption) and lower staff turnover due to better working conditions and higher wages. Future work along these lines could specifically address firms operating in electronic markets, in order to assess the impact of electronic commerce on productivity growth and performance.

## **CONCLUSIONS AND FUTURE RESEARCH AGENDA**

Electronic commerce is transforming the marketplace by changing firms' business models, by shaping relations among market actors, and by contributing to changes in market structure. Given the dynamic nature of these processes, the impact of electronic commerce will be firm-, sector-, and time-specific. Conclusions offered at this stage can therefore only be preliminary.

- *There is need for a continuous monitoring of the electronic marketplace. Case studies should address the sectoral and market specificity of organisational impacts. Research on the evolving nature of the commercial environment will help policy makers on issues of commercial governance, which are critical to the development of electronic commerce.*

Even if cyber-traders do not present a new commercial paradigm today, they play a catalytic role for other, more traditional companies that are entering electronic markets. Key market actors can thus contribute to the evolution and diffusion of e-commerce by forcing e-commerce solutions in sectoral and national contexts and, particularly, on suppliers.

- *Future research should analyse the role of e-commerce players in different national contexts, as well as the scope for governments to lead and encourage e-commerce solutions.*

Electronic commerce does not always lead to greater market competition, but it changes firms' competitive advantages, the nature of firms' competition, as well as the market on which firms compete.

- *Ongoing assessment of potential new barriers to market entry is needed. Future research could use firm-level data to analyse the competitive behaviour of e-commerce adopters on the domestic and international markets, while sectoral studies could address the dynamics of market structure, especially in the business-to-business segment. The existence of asymmetries in firms' ability to control access to the electronic marketplace should also be investigated. This research will assist policy makers to address competition issues, as well as to formulate policies targeted to SMEs.*

The open, and potentially global, nature of electronic commerce is likely to increase market size and change market structure, in terms of the number and size of players and the way in which players compete on international markets.

- *Research should look at the extent to which electronic commerce is really “global” or still mostly confined to national markets, and whether it is affecting countries’ relative competitive advantage.*

The extent to which firms can reorganise in the new electronic environment will crucially depend on the flexibility and adaptability of the work force.

- *Future research should investigate the role played by workers in business re-engineering, study emerging forms of work organisation on electronic markets, and address the need for “upskilling” of workers and redefining their functions in electronic environments.*

The impact of e-commerce on the marketplace will also depend on the existence of a critical mass of consumers.

- *Issues of trust and confidence, privacy and consumer protection in the electronic marketplace should be addressed from an economic perspective.*

A novel aspect of e-commerce is the emergence of virtual communities in online networks.

- *The role of virtual communities in shaping new relations and shifting market power among suppliers and consumers should be investigated.*

E-commerce favours the combination of streamlined business processes, flat organisational hierarchies, continuous training and skills acquisition, inter-firm collaboration, and networking. All these elements contribute to a favourable environment for innovation and improve performance.

- *Empirical research is needed to quantify the contribution of electronic commerce to the size and quality of product and process innovation.*

Annex 3.1

**ELECTRONIC COMMERCE AND NEW OPPORTUNITIES FOR BUSINESS SUBSTITUTION: SOME EVIDENCE**

In some cases, Internet commerce constitutes the logical extension to firms' business models and simply accentuates some of their characteristics without implying revolutionary changes. For instance, in the computer industry, there are some early adopters of business solutions which minimise inventory risk, which is quite high, given the frequent and sizeable drops in the cost of material and rapid obsolescence.

The best example is that of Dell. At the heart of the Dell strategy there is a model of "virtual integration" (Magretta, 1998). This model encompasses two very different business models: a vertically integrated model, which offers a tightly co-ordinated supply chain, and a virtual corporation model, which is based on focus and specialisation and can reach very fine market segmentation. In 1994, Dell pioneered what became known as the "direct business model" within the computer industry. The distribution chain was eliminated and close relations with customers and suppliers were established by the use of customised intranet sites. The key element in Dell's strategy is to speed up every element of its business. Internet commerce is growing fast at Dell – from \$2 million a day in the first year, to \$3 million a day, with peaks of \$6 million at Christmas, now – but it does not seem to have radically changed the company's business model. Rather, "Internet commerce is a logical extension of Dell's direct model".

In other cases, Internet commerce can entail the adoption of new business models which can replace or complement existing ones. Some examples of business substitution by established firms migrating to electronic are found in Annex Table 3.3.4. Obviously, these few examples do not allow generalisation, and as business substitution follows a sectoral dynamics, sectoral differences will also reflect different positions along the substitution path. However, Annex Table 3.3.4 suggests the existence of interesting differences that could be object of further research.

**Music retail**

The availability of multimedia features on the Internet, including audio, video and graphics, make it an ideal medium for promoting, marketing and selling music. Purchasers of music recordings can preview their purchases by listening to high-quality sound samples, viewing text and video clips, and searching an extensive catalogue of available titles. The Internet also allows users to download music digitally in a compressed format to a personal computer (PC) and store it on a CD using a read/write CD-ROM drive.

Internet-based retailers have certain advantages over traditional retail channels. Traditional retail stores limit the amount of inventory they carry and tend to focus on carrying a greater percentage of hit releases. Traditional retail stores stock an average of 10 000 stock keeping units (SKUs) and megastores stock an average of approximately 39 000 SKUs out of a total of more than 200 000 SKUs generally available in the United States and offered by online companies such as N2K (US Securities Exchange Database, N2K financial statement).

Annex Table 3.1. **Shifting from physical to electronic markets: changes in the business model**

Sector	Degree of business substitution
Music	Radical
Publishing	Radical
Transport	Partial
Information services	Mixed evidence
Retail banking	Radical
Marketing and advertising	None

Source: OECD.



For the moment, established online music retailers such as CDnow and N2K have relied on strategic alliances with Internet service providers such as America Online or aggregators such as Excite and Yahoo! to market and distribute their music. Other models are trying to emerge. NetRadio has established a CDPoint online store and plans to use "radio retail" to "buy-what-you-hear". Both DJ.com and Imagine Radio have partnered with CDnow to send their listeners to the online store and provide direct links from their downloadable "tuners".

Digital delivery of music thus has the potential to revolutionise the music distribution model. Digital recordings, once captured, can make an infinite number of perfect copies. Record companies will have to pool together, get permission from each of their artists, and choose a standard from among many technologies being offered, thereby giving up a significant degree of control over the distribution process. "This is the first time the music industry is realising its products into a channel in which they have little or arguably no control. A study found that nearly 80 000 illegal music files were already available on the Internet." (Lipton, 1998).

## Publishing

The case of the *Encyclopaedia Britannica*, completely devastated by the advent of the CD-ROM encyclopaedia, is a dramatic one (Annex Box 3.4). Now the company, under new management, is trying to rebuild its business around the Internet.

### Annex Box 3.1. *Encyclopaedia Britannica and the advent of CD-ROMs*

Since 1990, sales of the Encyclopaedia Britannica multi-volume sets have decreased by more than 50 per cent. The reason is simple: it costs in the range of \$1 500-\$2 200 to buy the paper version, while an encyclopaedia on CD-ROM, such as Microsoft Encarta, sells for about \$50 and customers often get it free because it is bundled with their personal computers as CD-ROMs. Interestingly, the largest part of Britannica's cost structure was not the editorial content, which constituted only about 5 per cent of costs, but the direct sales force.

	Sales price (\$)	Cost of production (\$)	% of cost attributable to content
<i>Encyclopaedia Britannica</i>	1 500 to 2 200	200 to 300	5
CD- ROM encyclopaedia	50	1.5	

When Britannica realised the threat from CD-ROM encyclopaedias it created a CD-ROM version, but to avoid undercutting its sales force, the company included it free with the printed version and charged anyone buying the CD-ROM alone \$1 000. Revenues continued to decline, the best salespeople left, and Britannica's owner, a trust controlled by the University of Chicago, finally sold out. Under new management, the company is now trying to rebuild the business around the Internet.

Source: Evans and Wurster, 1997.

## Transport

In other cases, new business models have only partially replaced traditional ones. Federal Express (FedEx), for example, has substituted a sophisticated "logistics information" business model for parts of its original model (*i.e.* a "mover of boxes"). Starting in 1982, three successive programmes were introduced (see Annex Box 3.4), the last of which, InterNetShip, extended online capabilities to the Internet; this programme is used by nearly 8 per cent of the customers who interact electronically. At the same time, FedEx continues to operate and own a physical forwarding and delivery infrastructure; its proprietary network, FedEx COSMOS, handles 54 million transactions a day.

## Travel

SABRE is an example of a company that is 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 (see Annex Box ). The advent of the Internet makes it much more feasible for them and for airlines to go directly to consumers. Therefore, SABRE is outsourcing its computer and network operations and focusing more on the value added of their information database (content versus infrastructure) (Bloch *et al.*, 1996).

Annex Box 3.2. **Organisational change at FedEx: from courier company to logistics and networking provider**

FedEx changed from courier company to a logistics and network provider. There were five key elements in the change.

**Personal multimedia:** In 1995, a new interactive training system was launched to teach basic interaction skills such as customer-contact methods and features of service categories to its 35 000 couriers and customer-service agents. Interactive multimedia training can occur at the beginning or at the end of a shift or whenever the individual can best fit in what are very personalised instructions.

**The high-performance team:** A customer calls for a pickup and speaks to an agent in a call centre. The request is transmitted to the COSMOS (customer, operations, management and services) database and then relayed to the dispatch centre in the local market, which, in turn, passes the request to a small computer located aboard a FedEx van (called DADS). Once the order is received, everything is taken care of by the network. Teams interoperate through electronic mail. The company has one of the largest single e-mail networks in the world – some 70 000 employees.

**Enterprise infrastructure:** FedEx developed the service quality index (SQI) which measures failure rates. The index is based on ten events that frustrate or disappoint the customer, events that are weighted on a ten-point scale. Every time the parcel changes status, information is recorded through sensors and entered into the COSMOS database which contains all the basic customer information – name, account number, address, package pickup location data – and communicates with a number of other systems and devices to maintain a complete record of each shipment handled. The courier picks up the package and uses the Supertracker, a small, portable, battery-operated, menu-driven computer with a bar code scanner, to scan the package's bar code. The courier then places the Supertracker into a port located on the DADS computer. The package information is automatically transmitted to the dispatch centre and the COSMOS database. As the package moves through the system and is scanned, this information is continuously updated. Before a night is over, FedEx will have scanned 2.4 million shipments, up to nine times each, as they move through the network.

**Interenterprise computing:** The FedEx PowerShip network automates shipping by printing the mailing labels, calculates the cost to its customers, and provides tracking and shipping. PowerShip is just one of the network-based products that FedEx provides to its customers, so that their PC can be integrated with FedEx's client/server application. FedEx either supplies a PC and the software to the customer, or integrates the customer's system with the FedEx system, or supplies the software, which can run on any PC equipped with a modem and a laser printer.

**The Internetworked business:** The latest step was to extend online capabilities to the Internet with InterNetShip.

**FedEx connects its customers electronically**

Service	Date	Customers using service
FedEx PowerShip	1982	Largest customers
FedEx Ship	1995	Mid-size/less frequent customers
InterNetShip	July 96	Any customer

Source: Margherio *et al.*, 1998.

Source: Tapscott, 1996.

**Information services**

In the case of "information services", the business substitution is more subtle but just as real. Case studies of content providers (Margherio *et al.*, 1998) offer a diversified picture. The online business model of the *New York Times* differs from the off-line model. In the latter, the New Journal controls the entire chain (content, advertising, manufacturing, distribution), in the online world all the production-related activities disappear. On the other hand, Dun & Bradstreet, one of the leading providers of business-to-business credit, marketing purchasing, and decision-support services world-wide, seems to be organising itself on the Internet much as it does in traditional markets.

## Banking

“Banks will not become obsolete, but their current business definition will, specifically in terms of the concept of a bank as an integrated business where multiple products are originated, packaged, sold, and cross-sold through proprietary distribution channels” (Evans and Wurster, 1997). That has happened before in banking. Some 15 years ago, US corporate banking was doing business on spreads; today, corporate banking consists of small businesses that compete product by product. While credit flows directly from lender to borrower, banks now make money by providing services such as risk rating, advice, market making.

The institutional market (business-to-business banking) has already contributed to disassembling the value chain and cutting out specialist and market makers over the past 20 years. For institutional traders, electronic trading systems such as Instinet, Posit, and AZX have accounted for nearly 20 per cent of the daily volume on the major US stock markets over the last decade. Until recently, however, it was inconceivable that a similar mechanism could provide similar benefits to individual investors (see Annex Box ).

Evidence of business substitution in the retail banking sector is still mixed. On the one hand, traditional retail banks seem to be slow to react to business opportunities in online markets. On the other, non-bank entrants enter the market with completely new business models. The new entrants, whose business models focus on a specific customer segment or on a specific transaction category, could constitute a real threat to traditional incumbents (McKinsey, 1997).

## Marketing and advertising

Marketing and advertising is the sector that is probably most affected by the use of the Web. Most people surfing the Web are looking for information. For suppliers, Web advertising offers the ability to target and deliver directed messages to an audience with specific demographics and interests; and the ability to collect, track, analyse, and leverage consumer behaviour/buying patterns facilitates the growth of online marketing. A global study evaluating 1 800 Web sites, with representative samples from different industries and countries for 1996, reveals that the business purpose of a commercial Web site is primarily promotional; but the value added to the customer is primarily logistic in nature (rates and fares are quoted and there are facilities locators), while Web sites rarely create “custom value”, defined as value that responds to a customer's preferences (*e.g.* searching a database of real estate listings based on preferred price range, location, size and style of home) (Ho, 1997). According to the same study, the marketing approach taken is not very different from the traditional one: product news, catalogues and portfolios, previews and samples, special offers and discounts, contests.

Annex Box 3.3. **SABRE**

The SABRE (Semi-Automated Business Research Environment) computerised reservation system began in 1959 as an internal organisational database for American Airlines. In the mid-1970s, the scheduling system was adapted for use outside American Airlines and released to travel agencies over a proprietary network in order to provide flight information through a central repository. The SABRE system proved very successful and provided the model for all future computerised reservation systems, not only for airlines but also for other segments of the travel and tourism industry. Currently, one traveller in three world-wide is routed through the SABRE system.

The emergence of online services like CompuServe presented the SABRE Group with an opportunity to expand. In 1986, EasySABRE was introduced as CompuServe's online travel agent, and CompuServe subscribers no longer needed to use a travel agent as an intermediary. The information traditionally accessed by travel agents was now directly available online.

Two years ago, the SABRE group further expanded their business model to include the World Wide Web. First, the command-based EasySABRE system was made publicly accessible through the Web. Second, SABRE created Travelocity, a Web site offering all of SABRE's features with an attractive graphical interface. The site provides schedules for over 700 airlines and can make reservations for more than 400. The Travelocity site also posts last-minute bargains and consolidator fares and provides an e-mail fare-tracking system which can send news on bargain flights to subscribers instantly. For major routes, passengers can even be informed via pager if their flight will be delayed. Other travel arrangements are also available, including car rental information for over 60 rental companies, and a hotel reservation system which integrates photographs, location maps, and reviews for over 35 000 hotels world-wide.

SABRE makes the transborder nature of electronic commerce clear. Since information is easily transmitted across national boundaries, international operations are facilitated, and expansion at a fast pace and low cost becomes possible. American Airlines did not need to establish a separate database in each city in which it operates around the world. Instead, it has been able to market access to its network anywhere, while maintaining its "production" facilities in the United States.

The development of Travelocity also underscores the importance of the Internet's open protocol system. It is now easier than ever before to extend a network directly to end users, as the infrastructure is already in place at the user's end. SABRE no longer needs to supply hardware or networking functionality to many of its end users. A simple IP address suffices. It is important to note, however, that SABRE is not switching to the open standard and eliminating its ties to traditional travel agent networks. The TCP/IP protocol is integrated into an existing business model in order to expand to reach new customers rather than to displace its old client networks.

The SABRE example does not bear out the view that the disintermediation brought on by electronic commerce will displace "middlemen" like travel agencies. While online travel sites have become popular (Travelocity is ranked in the top 25 per cent of Web sites in terms of "hits" and is ranked even higher in terms of number of visitors), 80 per cent of all tickets are still issued through travel agencies. The 20 per cent of passengers who have chosen the Internet are largely those who traditionally bought airline tickets by phone.

This should not be taken to mean that online services pose no threat to traditional agents. Travel agents face a clear challenge from this competition and may lose business as the technology improves and users become more comfortable as online consumers. As a result, travel agencies are working vigorously to improve service off line and to offer online services of their own. Moreover, as new distribution channels have become available to airlines, airlines have capped and reduced commissions paid to travel agents. Since travel agencies remain popular with travellers, airlines hesitate to cut their ties with them. Travellers complain that the SABRE system cannot provide the customised itineraries that are best created through person-to-person contact. In addition, consumers often feel that if something goes wrong, no one is accountable. It is likely, at least in the near future, that online services will simply be another channel of distribution. The most apparent result of the introduction of SABRE will likely be a higher level of service to consumers both on line and at the travel agency.

Annex Box 3.4. **From Spring Street Brewing Company to Wit Capital**

Spring Street Brewing, a beer company, launched in 1995 the world's first Internet public stock offering in order to raise capital. After ten months, more than 860 000 shares had been sold to 3 500 new stockholders. The capital totalled \$1.6 million, the amount needed for a viable marketing and sales initiative. Spring Street's initial public offering shows that the Internet was the perfect medium for a small, early-stage enterprise to find and reach potential investors and raise capital.

The second step was to use the Internet to create a trading mechanism, Wit Trade, which would act as clearing agent for stocks transactions. Wit Trade showed that the Internet can be used to provide moderate liquidity. More than a thousand would-be buyers and at least that many would-be sellers met over the Internet to buy, sell, and swap Spring Street stock without needing to go through brokers, deal with dealers, or have a seat on the stock exchange. They saved fees and commissions, and, by executing trades directly with other investors, they avoided the spreads charged by the market makers and specialists who are the middlemen of every traditional stock market trade.

The next idea was to create an investment bank and brokerage firm, Wit Capital, that would arrange stock offerings and facilitate stock trading on the Web. The company would develop a digital stock market in which sellers and buyers would interact directly. The idea was to deliver through the Internet to individual investors an open-architecture, low-cost public medium that is perfect for small-scale transactions, a model comparable to the one used by institutional investors. Since brokers had not the slightest interest in routing their orders to this new trading system and losing part of their commission, a new brokerage firm had to be created and a new and direct relationship had to be created with each and every individual investor. In 1998, Wit Capital will open a digital stock market and begin to offer no-spread direct trading.

**Price comparison**  
**US\$**

	Wit Capital	Schwab (voice order)	Merrill Lynch (voice order)
1 000 shares @ \$25 market order	\$14.95	\$155.00	\$428.00
1 000 shares @ \$25 limit order	\$19.95	\$155.00	\$428.00

Survey July 1997. Services may vary and other discounts may apply.

Source: Wit Capital (WWW/WitCapital.com).

Source: Klein, 1998.

Annex 3.2

**THE INTERNATIONALISATION OF BUSINESS: HOW GLOBAL IS E-COMMERCE?**

To what extent is electronic commerce really global today? Annex Table 3.3.4 presents some estimates of international revenues by companies selling on line. For companies selling exclusively on line, international revenues attain one-third of total revenues.

Annex Table 3.2. **International trade of selected e-commerce firms, 1997**

Company	Segment	Online revenues as % of total	International revenues as % of total
CDnow	Music	100	35
Music Boulevard	Music	100	33
Amazon	Books	100	26
Barnes & Nobel	Books	0.50	30
FastParts	Electronic components	100	30
Virtual Dreams	Pornography	100	25
Dell	Computers	almost 50	20
1-800-Flowers	Flowers	10	15-20
Sabre	Travel	67.30	17.50
E*Trade	Consumer brokerage	63	2.80

Sources: CDnow, Music Boulevard, Amazon, Sabre, E\*Trade (US Securities and Exchange Commission); Barnes & Noble (Cowles/Simba Information, "Electronic Advertising and MarketPlace Report", 4 March 1997); FastParts (Erwin *et al.*, 1997); Virtual Dreams ("CyberSex", *The Economist*, 4 January, 1997); Dell ("Dell: Net to Make Up Half of Sales", <http://www.news.com>, 28 April 1998); 1-800-Flowers ([www.1800flowers.com](http://www.1800flowers.com)).

**Banking**

One of the strategic challenges in corporate banking is how to address the issue of internationalisation. The Internet is a potential gateway to low-cost international expansion (offering domestic services to corporations abroad) through a virtual presence (almost two-thirds of the top 100 banks expect to use the Internet as a platform for global expansion). At the same time, however, the Internet might hinder this development due to the general increase in global access and competition (customers using local banks in foreign countries) and the emergence of virtual alliances between small local banks that jointly offer global services (Booz-Allen & Hamilton, 1997b).

**Information services**

Information services for businesses are above all a necessary complement to transactions involving physical goods and services. Therefore, for businesses, electronic services follow the distribution of cross-border physical products, and "regional proximity" partly determines the distribution of exports of physical products, since transport costs increase with physical distance.

Regional proximity may, however, be a much smaller factor in the case of electronic services for private households. For this target group, electronic services are an end-product for which transport costs (*e.g.* for telecommunication transfer) play a negligible role. Therefore, in the consumer sector, a world mass market, especially for entertainment services, is a very real possibility, as the film and music industries have already shown. Clear market dominance may be attained by the suppliers of consumer services from one country, as has been the case for the

United States. However, the rising importance of regional and local information for consumers, which is stressed in many market research studies, may partly counterbalance this situation (European Commission, 1996).

To prevent the erosion of their margins, leading financial information firms are seeking to increase exports of their services and to use the competitive edge gained at home to dominate regional markets. This increases concentration at the regional (*e.g.* European) level. These strategies are enabling market leaders to maintain high, albeit falling, growth rates and to increase their market share (see Annex Box 3.5).

#### Annex Box 3.5. Financial information services

A 1997 study by Compagnie Bancaire indicates that 80 per cent of Internet financial services are provided by US companies and the remainder largely by UK firms (Tommasi, 1997). This confirms the findings of a European Commission study (1996) that UK firms account for 81 per cent of the European market for financial services.<sup>3</sup> Many explanations are offered. One is the predominance of English in this environment. Another is the reputation of UK and US firms, with historically strong institutions and healthy financial markets.<sup>4</sup> They may also have benefited from the availability and use of Audiotex services in the United Kingdom and their move to the Internet (Confederation of Information Communication Industries, 1995). Finally, there is the relative weakness of other markets, where bank lending dominated stock markets as a source of company finance.

The United States and the United Kingdom were first to open up their financial markets to the rest of the world over the Internet. This should make Wall Street and the City even more dynamic and enable them to attract most of the world's savings. Less dynamic markets can expect to fall even further behind unless ways are found to increase their attractiveness. In France, for example, the market is very institutionalised. While this has created a kind of public service that makes financial information accessible to all at very low cost, it is also the source of its weakness. To take off, the financial information market will have to offer services with high value added, in particular financial analysis.

The growing dispersal of investment and savings could aid the development of more specialised financial service groups. The Compagnie Bancaire report forecasts that, as investors become more independent, they will move away from instruments like unit trusts/mutual funds towards more individual forms of investment. However, the new-found freedom among private investors is expected to increase the risk of markets crashing or overheating as a result of speculation, rumours and false information. Because it is hard to control information placed on the network, the door is left open to abuse, fraud, or misinformation (*Wall Street Journal*, 8 June 1995).<sup>5</sup> Liberalisation will therefore need to go hand in hand with regulatory reforms that create a safe environment for the growth of Internet-based financial services.

### Brokering

American Internet brokers have started moving into the United Kingdom and are increasingly setting their sights on the continent as well. Their arrival poses a challenge for European online trading firms, whose ambitions are, for the moment, limited to national markets. Analysts expect the arrival of the Americans to accelerate the vast changes in the securities business that are already under way as Europe becomes a single market. In April, Charles Schwab started an online trading service, and in June the E\*Trade group, based in California, announced a joint venture with a British partner and a licensing agreement in Germany.

Under competitive pressures at home that are driving down profit margins, American brokers are being drawn to Europe. To build a European business, they are applying various formulae. Though most American online brokers accept European customers for trades on United States exchanges, they refrain from actively advertising so as to avoid irritating European regulators. Schwab, for example, only offers European customers the chance to trade on individual European exchanges, while E\*Trade is signing up with local customers and licensing its systems. European banks and brokers are fighting back. Barclays PLC, one of the largest British banks, with 2 500 branches in the United Kingdom, will launch its own online brokerage service in September (*International Herald Tribune*, July 1998).

### Music

International revenues represented about 21 per cent of revenues in the first quarter of 1998 for CDnow, and 25 per cent of 1997 online revenues for Music Boulevard (the online shop of NK2). However, there is little incentive for customers in countries with a fairly developed market to buy products already available at home. The UK music market, for example, is the most developed in Europe and is dominated by five large multinationals with nearly a 77 per cent share (Janson and Mansell, 1998). Even if US record companies export to the United Kingdom or have

established a strong base there (e.g. Tower Records), online ordering is still coupled with physical transportation, which is time-consuming and expensive.

Annex Table 3.3 presents some estimates and comparisons of the time and cost of delivering CDs ordered online from the United States and the United Kingdom (Tower Records and Internet Music Shop) to continental Europe. Shipping a CD from CDnow costs \$13 on average and can take three weeks as compared to \$3 and 7-10 days from the UK-based Internet music shop. Tower Records, which can ship records both from the United States and from Europe (as well as Asia), is a clear example of a company establishing presence abroad in order to conquer market shares by avoiding transport costs. Interestingly, the UK-based Tower Records does not yet ensure secure online ordering (although it is preparing to do so) and orders are still done by mail. This may reflect the fact that online shopping in the European market is still a relatively modest phenomenon. High transport costs are forcing CDnow and Music Boulevard (both owned by N2K) to locate their operations outside North America. N2K has now established a wholly-owned subsidiary in Japan, the world's second largest market for recorded music sales. These subsidiaries can tailor the market better and offer faster and cheaper delivery (Rawsthorn, 1997b).

Annex Table 3.3. **Shipping time and charges from US- and UK-based CD stores to continental Europe**  
CDs in stock

	Shipping rates (US\$)	Quantity (No. of CDs)	Shipping time	Carrier
cdUSA	19.95	1-5	2-3 days	DHL Worldwide Express
	24.95	6-10		
	29.95	11-29		
CDnow	11.89-16.49	up to 3	3-4 weeks	
	1.69-2.69	next 3		
	1.20-2.20	each additional item		
Music Boulevard	6.99 + 2.25 additional item	1	7-14 days	Air Mail
	20.99 + 2.25 additional item	1-3	2-5 days	DHL Worldwide Express
CD UNIVERSE	5.99 + 1.5 additional item		5-10 days	Air Mail
	9.95 + 2.25 additional item		2-5 days	Global Priority
	24 + 2.5 additional item		overnight	Express Mail
Tower Records from the US	20	1-3	2-3 days/not guaranteed	Federal Express
	25	4-6		
	30	7-9		
	35	10-12		
	40	13-15		
	45	16-18 (maximum)		
Tower Records from the UK	2.3	1	5-7 days	UK Royal Mail
	4.4	2		
	5.9	3		
	7.5	4		
	9	5		
	10	6		
Internet Music Shop	3	1	7-10 days	1st class mail
	2	each additional item		

Source: [www.cdusa.com](http://www.cdusa.com); [www.cdnow.com](http://www.cdnow.com); [www.cduniverse.com](http://www.cduniverse.com); [www.towerrecords.com](http://www.towerrecords.com).



## NOTES

1. Proprietary systems tie the choice of a particular service to specific hardware. Each network in a proprietary system delivers services that are limited in nature, identity and number. With proprietary systems, often the only way to obtain a variety of data is to install several different terminals. Standardised networks can provide a range of different services via the same infrastructure, and hence the same terminal; with standardisation, only one terminal is needed.
2. At least for the time being, as the trend is for all networks to switch to the ICP/IP standard, which uses cryptography and access codes to make the system secure
3. Estimate based on user group turnover. In 1994, total EU revenues from demand by firms in the financial sector amounted to ECU 1 834.3 million. That year, UK revenue from the same source was ECU 1 497.1 million. UK network service providers therefore account for 81 per cent of the revenue from demand for financial services.
4. For instance, the UK market is currently benefiting from the consolidation and increased representation of UK securities on the market, and from a change in the composition of the stock market (see "UK to Become Counting-house of the World", *Financial Times*, 7 April 1997). The market is also reported to have a time zone advantage over other markets (see "Measuring the City's Fund Strengths", *Financial Times*, 15 January 1997).
5. "Exchange Warns of Internet Risk", *Wall Street Journal*, 8 June 1995.

