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BUSINESS-TO-BUSINESS ELECTRONIC COMMERCE IN PUBLISHING, RETAIL DISTRIBUTION AND PHARMACEUTICALS DISTRIBUTION IN FRANCE

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FOREWORD

This report has been prepared in the context of the OECD work programme on electronic commerce. It is a contribution to the development of the OECD Electronic commerce Business Impacts Project (EBIP).

The OECD Working Party on the Information Economy (WPIE) reviewed an earlier draft of this report and as recommended by this Working Party, the Information, Computer and Communications Policy (ICCP) Committee agreed to the declassification of this paper through a written procedure. This final version incorporates comments by Member countries.

The report was prepared by Muriel Faverie, in collaboration with Graham Vickery of the OECD Directorate for Science, Technology and Industry and benefited from contributions from other staff of the ICCP Division.

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SUMMARY

In early 1999, the OECD launched an internationally comparable study of the diffusion and economic and competitive impacts of business-to-business electronic commerce over the Internet. A first set of case studies was conducted in France between February 1999 and September 1999. Three sectors were chosen for their different characteristics: book publishing, mass retail distribution (clothing, textiles, food and drink, furnishings, etc.) and pharmaceuticals distribution. The differences across sectors are substantial and relate to the nature of the product (whether it can be digitised, is costly or is perishable), the nature of transactions between suppliers and purchasers, the market structure and regulation. This report gives a first set of results concerning sectoral differences in the spread of business-to-business electronic commerce and related organisational and economic effects.

This initial work concentrated particularly on business-to-business e-commerce. It is based on a set of firm-level case studies covering both business start-ups (innovative enterprises born with the Internet) and traditional firms, well established in their market before the widespread use of computerised communications and the Internet. This made it possible to study the relations among the various parts of supply and value chains and, in particular, the dynamic effect of new business models implemented by start-ups on other firms.

The principal conclusion of the study is that the use of business-to-business e-commerce via the Internet follows four main strategic trends in the three sectors studied, although with extremely different impacts. These strategic trends are:

- *Rationalisation of activities* and increased productivity by automating business transactions.

- *Innovation* through the setting up of new business models and disintermediation of some business functions.

- *Increased integration of the supplier-producer-client-consumer value chain* and the evolution of business processes from being driven by supply to being driven by demand.

- *Competition* to maintain or enhance market share or to counter new entrants.

The book-publishing sector is strongly affected by strategies to innovate and integrate the value chain. New business models for digital publishing and distribution and on-demand publishing are undermining the sector's traditional organisation and economics. This is essentially due to the nature of the product, the fact that it can be converted into digital form and the resulting disintermediation and reintermediation effects.

In retail distribution, business-to-business electronic commerce over the Internet is used primarily to pursue strategies to rationalise business processes and to shift towards more demand-driven organisation, as a complement to existing EDI technologies, applications and strategies.

The pharmaceuticals distribution sector is already a major user of EDI and information technologies, and business is demand-driven. Innovation strategies have emerged, including among clients

and pharmacists. They involve disintermediation and the bypassing of some established distribution transactions and the internationalisation of sourcing. The major pharmaceuticals distributors regard these approaches as fragmented, with little effect on established distribution structures. However, the market leader (OCP, with 40.5% of the pharmaceuticals distribution market) uses the Internet as a strategic means of differentiation to counter competition from mass retailers and new distribution channels for non-prescription medical products and other products sold in pharmacies.

In all three sectors, the dominant trend is towards demand-driven strategies and organisation. This involves reorganisation – notably of logistics and transport – which has a significant impact on the spread of e-commerce. The rate of diffusion and use of e-commerce does not seem to depend greatly on availability of or access to e-commerce technologies. Rather, it depends on the important material and human investments needed as well as the reorganisation and the amount of time required to generate and circulate knowledge about how the new technologies and systems work. Thus, in these sectors, success or failure on the Internet does not depend solely on first-mover advantage. This puts into perspective the ability of Internet start-ups to compete effectively with traditional enterprises, even when the latter have not yet wholeheartedly moved into e-business.

The impact of these developments on competition is not simple to measure. The idea that the Internet increases competition can be questioned. The Internet makes it possible to broaden potential markets by giving access to more suppliers and clients. However, because of the structure of some EDI applications via the Web, supplier Web sites and extranets, transactions may be organised in ways that are more hierarchical than competitive. Whether the new markets will be increasingly or decreasingly contestable[1] still depends on the types of contracts set up between participating firms. And these in turn depend to a great extent on existing market structures.

This report has four parts. Part I describes the main trends in the spread of business-to-business e-commerce in firms in the three sectors and the effects on the economics and organisation of each one. Part II looks at factors that explain the differences among the sectors. Part III addresses the impact of business-to-business e-commerce via the Internet on market structures and competition, and is followed by some Conclusions. The scope of the study and the methodology used, with a list of the different enterprises involved, are set out in Annex 1. Annex 2 provides data on the development of electronic commerce in France. A glossary of technical terms used in the report can be found in Annex 3.

I. THREE SECTORS, THREE DYNAMICS

Four main general trends can be discerned in the development of business-to-business electronic commerce via the Internet: *i)* rationalisation of business activities and productivity by the automation of transactions and business processes; *ii)* innovation to set up new business models and to disintermediate certain functions; *iii)* integration of the value chain and a shift in business processes from supply-driven to demand-driven approaches; *iv)* and defensive or offensive strategies to compete against new market entrants. These four strategies are observed in the three sectors examined, but their effects on the economics and organisation of the sectors differ greatly.

Destructuring and restructuring supply: book publishing

Book publishing, in France as elsewhere, is strongly affected by e-commerce via the Internet. Changes were first felt in bookshops at the downstream end of the system but now affect the entire trade. In addition to shops selling books in paper form to consumers, there are now points of sale for books in digital form, distribution sites for bookshops opened by distributors or wholesalers, and sites which, like that of Éditions Lamy, offer added value services based upon information and its centralisation. On the Internet itself there are now electronic links between book distribution sites and other sites, such as those of supermarkets.

Book selling on the Internet is a major issue for all players in the business in that it challenges the existing organisation. The latter is threatened by three effects: *i)* the expansion of digital book distribution; the risk that intermediaries will be removed from certain functions (*e.g*. agencies, distributors); *ii)* a new economic pattern will be introduced; and *iii)* the fact that the current organisation of book distribution does not lend itself to selling via the Internet.

New business models and the breakdown of traditional boundaries

A particular characteristic of books is that content is separable from container. The text can be digitised and sold and delivered over the Internet. As a result, new models of digital publishing and distribution methods have arisen (Box 1). They have a new type of organisation (digitisation of the text, direct publisher/consumer contact and publishing on demand) and are defining a new cost structure. This is breaking down the boundaries between production, printing, publication and distribution, the various trades that traditionally structure the sector. All these functions are now being carried out by the publisher.[2]

Box 1. Digital publication and publication on demand

www.00h00.com (in French, "*zéro heure*") is an electronic publishing site created in June 1998. Its business, like that of a publisher, is to select texts, purchase the copyright and publish books. However, it differs from a traditional publisher in that instead of producing thousands of copies of a book and placing them in bookshops, it publishes the book on demand, either on the Web in electronic form or by mail in paper form. It publishes and sells recent works, or reissues out-of-copyright classics which can be downloaded (Acrobat, "protected" by a code) or received in paper form. One year after its creation, the site offered over 200 titles. The entire process takes place on-line. An extract and a table of contents of each book is presented. The client makes his/her choice, orders the book and pays for it. The digitised text is transmitted directly by electronic mail from the publisher to the client, who may either read it on screen or print it. The firm's digital printing equipment also allows it to offer an on-demand publishing service. In this case, the client receives the book in paper form by mail within 48 hours.

Cylibris (www.cylibris.com) is an on-demand publishing site for original books. It also employs the new digital printing and reproduction technologies to sell books on demand in either paper or electronic form. To avoid problems of copyright and direct competition with traditional publishers, Cylibris has specialised in publishing authors' first books. The site was created in May 1997 and now, two years later, offers 25 titles. The visitor to the site can read extracts from the book, order it and pay online. The book is then sent by mail.

Source: OECD.

Traditional publishers are moving to e-commerce via the Internet slowly and pragmatically. The issue is what electronic commerce and the direct publisher-consumer link can do for them. Most do not believe that electronic books will replace paper books, but they foresee complementarity between added value Internet services and traditional services. This is the view of Lamy, a publisher specialising in the sale of legal books and journals (www.lamy.fr), which is using digitised information to develop a range of services for consulting databases and special books against payment. This publisher is also a leader in the transport field. On the basis of its reputation and its experience in electronic services, it established in 1997 a freight service which operates as a clearinghouse for carrier services, *Téléroute PC*, accessible via Internet (www.lamy.fr) and reserved for subscribers. Thus, while e-commerce via the Internet is breaking down the boundaries between the different parts of the book trade, it is also breaking them down between sectors. This illustrates the shift from an industrial and commercial economy based upon tangible resources to an information economy that utilises virtual resources such as knowledge, skills and experience.

Disintermediation and new cost structures

In the digital publishing model, disintermediation is total. Printing, transport and logistics costs are eliminated, as are those for marketing and field salesmen. Practically all costs related to retail sales at a physical site are also eliminated, as the bookshop is virtual. Digital publishers, like virtual bookshops, must nevertheless ensure their visibility on the Web, and this means a considerable investment in advertising and communication.[3] However, this organisation costs nearly 65% less than traditional book distribution (Table 1). This figure resembles those generally cited for the US publishing sector (Schavey, 1998). In virtual form, a book makes a profit once the print run exceeds 100 copies, ten times fewer than in traditional publishing. Incidentally, prices on the 00h00 site show that the downloaded version of a book costs three to five times less than the paper edition. The difference should increase further as the business develops and as these sites increase productivity (lower costs under the heading "miscellaneous" in Table 1).

On-demand publishing faces certain costs in addition to those of digital publishing: the publishing, printing and transport costs that do not benefit from the economies of scale of the traditional arrangement. The total cost of publishing and distributing such a book would come to about 20% less than that of a traditional book (Lupieri et Stehli, 1999). In France, since paper books fall under the Lang Act, the price of paper books offered by 00h00 are within 10% (plus or minus 5% of the price to the public) of

those proposed by any other virtual or physical bookshop. However, with on-demand publishing, all the books produced in paper form are sold, so that costs related to remainders should be reduced by about 20%.

Table 1. Disintermediation and new cost structures in publishing

Traditional publishing			Digital publishing		
Organisation		**Costs[1]**	**Organisation**		**Costs[2]**
Publishing	Copyright	FRF 6	Publishing	Copyright	FRF 6
	Printing	FRF 33		Printing	FRF 0
	Miscellaneous	FRF 4		Miscellaneous	FRF 4
Marketing	Advertising		Marketing	On line advertising	
	Field salesmen	FRF 10		Visibility of site	FRF 10
Wholesale distribution	Stocks		On line distribution	Stocks	FRF 0
	Logistics	FRF 10		Logistics	FRF 0
	Transport			Labour	FRF 13
				Transport	FRF 2
Retail distribution	Stocks	FRF 37			
	Rent				
	Labour				
	Total	FRF 100		Total	FRF 35

1. Assumption based on the current distribution of resources for a book priced at FRF 100 by the Lang Act.
2. Marginal cost of producing a digital book that would cost FRF 100 in a bookshop.

Source: OECD.

The organisation of the book trade is not immediately threatened by these new business models, since more than 98% of publishing turnover is still earned through traditional publishing and distribution. However, certain observers (Choi *et al.*, 1998) predict that books in paper form will disappear and that the model proposed by 00h00 and Cylibris will prevail. Nonetheless, most sector representatives interviewed believe that the substitution phenomenon will only concern short texts such as novels, poetry, magazine articles and scientific or specialist journals, encyclopaedias, dictionaries and practical guides (do-it-yourself, gardening, cooking, decorating, etc.) or school manuals. For other works, such as literary works, essays, plays and the classics, large-scale replacement is not expected to occur. Indeed, the new digital publishers, such as 00h00.com and Cylibris, state that they occupy niche markets and deal with marginal demand. In the case of Cylibris, for example, the low cost of producing and distributing a book in digital form enables it to publish first time authors without much risk.

The question as to whether digital books will replace or merely complement books in paper form remains unanswered. Some in traditional publishing would prefer an outcome in which legislation would oblige virtual publishers (paper or digital form) to issue only books that had first appeared in traditional bookshops.

The book trade representatives participating in the study were most concerned by the on-demand publishing model and the risks that disintermediation and undermining of established procedures represent.

In fact, use of the Internet to sell traditional paper books, combined with network logistics, could completely undermine the present means of publishing, marketing and distributing books. In the on-demand model, marketing and distribution need no salesmen in the field. Also, anyone (or almost anyone) in the trade can set up a virtual bookshop provided that they have comprehensive and high-quality information and a system that reacts rapidly and seamlessly to demand. In publishing, the best information is still that of publishers, and this ensures their business and their place in the sector. However, the various logistics jobs traditionally carried out by distributors are not very clearly delineated. Certain printers already manage stock and undertake mail order; some have recently introduced on-demand-printing facilities which allow them to react rapidly to changes in demand. With the Internet, the book trade could be reduced to an association between the publisher, who would manage the database as well as all marketing and sales, and the printer, who would manage production and logistics. The Internet challenges the trade's existing organisation by removing the boundaries of jobs and producing an upward-moving vertical integration for the bookshop and a downward-moving integration for the publisher and printer.

In order to safeguard their position and their business, traditional distributors and bookshops are adopting a "first-in-the-field" approach. They are digitising the activities that can be digitised, such as information, marketing and trade links, and introducing on-demand publication services and new logistics.

Business-to-business electronic commerce serving the new organisation of trade and logistics

In France, the logistics of book distribution has traditionally been supply-led. A publisher who decides to publish a book contacts his/her usual distributor. Depending on the book's characteristics (author, subject, etc.), these partners work out an initial estimate of expected sales. On this basis, the publisher decides the size of the first print run. The field sales team then presents the book to bookshops, which submit their orders. The size of the print run is revised on the basis of the number of orders received. This first step is what the trade calls "standard orders", which are equivalent to about half of bookshop turnover. Electronic networks are not used at this stage, as orders pass directly through the salesmen and the bookshops. The networks intervene at the restocking stage, when a bookshop decides, having regard to its stock, sales forecasts or some other reason,[4] to order more copies. These orders are passed in various ways. Most are processed by telephone, fax and mail. Others are processed via the Minitel and EDI. The transactions take place either directly, between the bookshops and the distributors, or through the exchange platform set up by Dilicom, whose ordering service has been available on the Internet since 1998 (Box 2).

Box 2. Dilicom, an EDI exchange platform between bookshops and distributors

Dilicom is the new name of Edilectre, a corporation set up in 1989 by book distributors, bookshops and various bodies representing the book trade, such as the *Syndicat National de l'Édition* (National Publishing Federation) or the *Cercle de la Librairie* (The Bookshop Club). Its aim was to create, and is now to run and develop, a business-to-business EDI service for the book trade. Edilectre can accommodate EDI messages in different formats, which enables all distributors and member bookshops to process orders using the same database and the same system. In technical terms, Dilicom can receive, translate and transmit in 12 languages over any network. The service is accessible through Minitel, computer systems dedicated to ordering and management, and, since July 1998, the Internet. It is used by bookshops only for resupply purposes.

At the beginning of March 1999, the service was being used by 2 731 bookshops, or about 13% of the total in France. The database, Edilectre, contained about 350 000 titles, published by 1 800 publishers and distributed by 100 distributors. It accounted for about 65% of book distribution turnover in France. Nearly 70% of messages from bookshops came via Minitel, which accounted for only 2% of orders; about 5% came over the Internet. Over the last ten years, Dilicom has posted the same turnover, FRF 7 million, with expanding business offset by reduced prices.
Source: OECD.

According to bookshops, this system, with its supply-driven approach, is poorly suited to virtual bookshops, especially when these are independent, like Alapage.com (www.alapage.com) or *Le Furet du Nord* (www.furetdunord.fr). Such bookshops are open 24 hours a day and offer their customers over 400 000 titles. They carry little or no stock and send out orders for books several times a day in small numbers or even single units, according to demand. Virtual bookshops,[5] which account for a very small share of sector turnover, are increasing the trend, already apparent in traditional bookshops, to move from a supply-driven to a demand-driven distribution model, and from a situation where orders were typically for a small number of items in large quantities (a bookshop like Fnac handles about 50 000 titles), to one in which a large number of titles are ordered in small quantities.

In order to cope with demand, the trade has set up a number of schemes using EDI networks and the Internet to handle transactions between the different players (orders, logistic follow-up and payment). Such developments would not be effective without the digitisation of titles, a unified reference system throughout the sector, the establishment of on-demand printing systems, and the introduction of specific stock and logistic arrangements (Box 3).

Box 3. New logistics in book publishing

The multimedia group Havas is a subsidiary of Vivendi, which in 1998 posted a turnover of FRF 19 billion. In April 1999, Havas Service, the distribution subsidiary of Havas, announced that in one year's time the company would offer on-demand printing services and a logistic circuit parallel to the traditional delivery route in order to meet demand from virtual bookshops. This move is also intended to back up the development of the site selling cultural products, BOL France, which Havas opened in partnership with Bertelsmann. Havas sees its entry into the world of the Internet and these developments in its logistics primarily as a way of countering the risks of disintermediation arising from the increase in virtual bookshops, the expansion of new digital printing business models, as well as the potential advent of new transport and logistics firms into the market.

In another example, Fnac has split its logistics system into two to support its developing strategy of selling over the Internet: on the one hand, the logistics of its traditional bookshop business and, on the other, its activity as an Internet bookshop. In May 1999, Fnac bought the *Société Française du Livre*, a book distribution wholesaler specialising in logistics and capable of delivering 60 000 titles in 48 hours. Fnac aims to develop and integrate this logistics tool to respond efficiently to demand arising from its direct sales site on the Internet. This development adds to but does not endanger the established logistics system of the firm's retail stores (which relies on stocks and uses EDI networks for 99% of its orders).
Source: OECD.

Electronic commerce and the regulatory framework

E-commerce via the Internet may also challenge the effectiveness of existing regulations. As noted above, the entire economy of the publishing sector is changing. Traditionally, it has been regulated by two laws: the Lang Act, which sets book prices and arranges the distribution of profit throughout the trade, and copyright legislation.

The Lang Act, promulgated in 1981, addresses the traditional production and distribution of books. The Internet-based organisation appears to limit its effectiveness by introducing new biases. First, a geographical bias: the Lang Act, which sets a price for a book, applies only in France; nothing prevents a virtual bookshop from circumventing it[6] by setting up in a neighbouring country. Second, an economic bias: profit is distributed from the bottom up, according to the theoretical value added by the different players, so that with disintermediation, the profits of publishers increase to the detriment of downstream actors. One may ask how these factors will affect the growth of electronic commerce. Some in the trade, usually new entrants, feel protected by a law which enables them to avoid price competition and finance their expansion. The activities of virtual bookshops located outside France but selling French books are

still too small to worry them, and the investment necessary to introduce distribution logistics systems is considerable. However, others in the trade believe that the law prevents new downstream entrants from developing their business as quickly as they need to, in that their income does not reflect the services they offer.

Although information is expensive to produce, its reproduction and distribution over the Internet cost practically nothing, both for those who create it and for those who pirate it. In France, as in the other OECD countries, laws on copyright and intellectual property have been adapted to apply to books in digital form on the Internet and infringements of the rights of publishers and authors can thus be challenged under the law.[7] However, it is difficult to identify infringements and to take appropriate action, in view of the changing technologies and the sheer scale of the Internet.

Electronic commerce and demand-driven business: retail distribution

In retail distribution, the effects of business rationalisation and of organising and giving impetus to a demand-driven approach seem much more important than those of the intermediation and disintermediation of systems.

The problems facing the mass retail sector are the maturity of the domestic market, the reduction of margins and the limitations of price competition. This situation is not new, and over a number of years distributors have reacted by developing strategies for rationalising activities, extending business abroad, differentiating brands, and emphasising quality-based competition, all of which make extensive use of information technologies.

For example, since the early 1980s there have been costly schemes for computerising the value chain from main suppliers through to checkout and for standardising the languages, processes and standards used. In this context, electronic commerce over the Internet has three effects. The first is to add to the existing information structure by developing internal or external electronic links with suppliers not equipped with EDI, as well as with partners and clients. The aim is to create a global information system capable of feeding the maximum amount of information back from client to producer so that, ultimately, cash registers generate the orders driving the business. The second effect of e-commerce over the Internet is to make the system more dynamic by improving the knowledge of clients and developing new links with them (be they enterprises, institutions or individuals). The third effect is to increase rationalisation of the business.

The Internet at the service of a new information structure

In retail distribution, the Internet can be used for many purposes: search for financial data, on-line recruitment, technical databases for retailers and salesmen in the field, EDI applications with suppliers, commercial Web sites, etc. These applications are based on new information structures. The example of *La Redoute* gives an overview of the way in which the Internet can be combined with other information technologies to create a global information system (Box 4).

Box 4. La Redoute and the Internet

La Redoute is part of the *Pinault Printemps La Redoute* (PPR) group, which is very advanced in terms of electronic commerce.[8] In 1998, PPR invested FRF 42 million in e-commerce, and in 1999 was to increase its investment to FRF 80 million. The group's study of e-commerce led La Redoute to invest in restructuring its information architecture so as to use Internet technologies internally (introduction of an intranet), as well as externally with its suppliers of goods and services, its contractors and carriers.

An intranet. The current intranet project (1997-2000) is intended to provide all line staff (management and sales) and supervisors on industrial sites with networked computers (PCs). This involves about 4 500 people on over 100 sites (headquarters, subsidiaries, warehouses, agencies and stores). The objective is twofold: primarily, to facilitate internal communication and, secondly, to improve circulation and use of information between sites and between divisions of the firm by introducing e-mail systems and systems for collecting, storing, processing and distributing information. This internal network also gives Internet access to a limited number of people presumed to need it in their work: possibly a few hundred in departments involved in purchasing, selling, communications, management and strategy.

An EFI (electronic form interchange) Web server with goods suppliers not equipped with EDI. At the same time, La Redoute is involved with CAMIF, Quelle and Manutant in the EFOVAD project (exchange of computerised data with distance-selling suppliers) in introducing a common EFI Web site for suppliers. The aim is to integrate suppliers with which traditional EDI systems have not been set up. For La Redoute, this means over 95% of suppliers and over 90% of volume ordered. Most of these suppliers are small or foreign; transactions are occasional and involve only limited flows of goods and services. At present, the scheme involves about 60 suppliers (about 15 already use the service) and should involve over 1 000 by the end of 2000. The system should enable La Redoute to use EDI in its entire purchasing chain with suppliers. It is seen as a supplement to the conventional EDI system that already exists with 25 of La Redoute's biggest suppliers and which is expected to be maintained. The aim, as for EDI, is to reduce delays and errors, to improve stock management and, in the long run, to ensure feedback in real time and thus be better informed about demand and improve the firm's reactivity to market changes.

An EFI transport and logistics Web server. The firm is planning to introduce a similar system with suppliers of services, particularly those involved in logistics and transport of merchandise. The firm sees this project as very important and simpler to introduce than others, since the transport sector, especially international transport, has already made good progress in using information technologies. The scheme provides for equipping with EDI the 40 carriers (road, air, etc.) handling the most traffic (70% of the total). The EFI Web approach will be kept for carriers handling less traffic and for small transport businesses.

An EFI Web server for contractors. Another current trial concerns the direct link between distributor and contractor via the EFI Web. It is being implemented under the European project Tex.At.Work.[9] For La Redoute, the aim is to build an information network that will enable it to direct, practically in real time, activities throughout the production and logistics circuit from raw material supplies through to delivery, via design and production. The goal is to improve the quality of the response of supply to demand by adjusting supply to meet demand, reducing stock and delays and reducing the number of unsold products. At present, the experiment is being carried out with three contractors.

Source: OECD.

Towards demand-driven business

One aim of these comprehensive information systems is to return the maximum amount of information from client to producer, in order to construct a reactive system whose point of departure is the final consumer and in which distributor and supplier work closely together to maximise consumer satisfaction and reduce costs. The two main features of this system are exchange of paperless, high-quality information and a continuous flow of merchandise. At the same time, marketing strategies are evolving and

changing from product marketing to a marketing strategy for each type of category (category management).

Table 2. A better supply-demand management system

Use of the Internet	Increasing a demand approach
Internet site	Relational marketing. Customised site, customised supply. Data mining.
Intranet	Collection, processing, circulation and treatment of information.
Extranet	Feedback of information to the suppliers concerning clients and demand.
EFI Web or EDI Web for suppliers	Extension of the automated circulation of information to all suppliers through to the suppliers of raw materials. Feedback of client information to production. Search for a better adaptation of supply to rapid changes in demand.
EFI Web or EDI Web for carriers	Knowledge of the location and status of the shipment at any time. Improvement of the quality of transport and delivery of products.

Source: OECD.

The second expected effect is rationalisation, with fax, telephone and mail transactions replaced by electronic transactions with automated processes. When applied from the production line through to the POS (point-of-sale) till, automation should minimise stock shortages, losses and all sources of non-value in the links among the commercial partners. By seeking jointly to improve the overall efficiency of the supply chain, rather than taking isolated productivity measures, partners can achieve cost reductions throughout the marketing cycle, from production through to final sale. Savings are achieved in terms of the cost of processing orders (fewer re-entries), but primarily in terms of reducing the number of errors, disputes and delays. A commercial Internet site also offers a cheap way of improving stock management, for example through short promotional operations for unsold products at practically negligible cost (see Table 3).

Table 3. Rationalisation of activities

Use of the Internet	Sources of rationalisation and greater productivity
External and internal communication	Reduction of the costs of communication and information transmission.
Supplier Web sites	Reduction of stocks and delays. Reduction of information re-entries. Reduction of errors and the costs of handling errors. Reduction of the human cost of management and purchasing follow-up. Reduction of purchasing costs and opening of markets to foreign or new suppliers.
Carrier sites	Reduction of delays and errors. Reduction of information re-entries. Improving reliability of activities. Reduction of transport costs.
Commercial sites	Reduction of the costs of advertising, promotion and relational marketing. Improvement of stock management and reduction of the number of unsold products and delays.

Source: OECD.

As the example of La Redoute (Box 4) shows, all suppliers are potentially concerned by the introduction of EFI Web sites, not only those in sourcing, logistics and transport, but also those involved with supplies, manufacture and procurement of raw materials. For the big names, this means many thousands of suppliers. The development of EDI is very uneven. Firms like Casino or Leclerc, which specialise in retail distribution, are already linked by classic EDI systems to more than 75% of their suppliers for between 80% and 90% of the total flow of products ordered; in the mail order sector, distributors are linked by EDI to only 30% of their suppliers on average for less than 30% of the total.

A new logistics organisation

As in publishing, changes in how business activities are driven are almost always accompanied by logistic reorganisation. Non-perishable goods are generally distributed via two different circuits: orders from stock or orders filled directly. Orders from stock involve products stocked by distributors. Management on the basis of stock is costly in terms of fixed assets but results in wider margins, since the firm deals in large quantities and benefits from supply-side economies of scale. It also allows for managing stock on an “as and when” basis, which reduces the risk of stock shortages and delays. Orders placed directly are for products stored by the suppliers. These are generally heavy or cumbersome products or those for which demand is low. Orders taken by the distributors are sent directly to the suppliers. Because the quality of management of stocks, transport and logistics depends upon the supplier, the distributor is exposed to certain risks (notably stock shortages) which are out of his control. All the actors interviewed in this sector believe that it is practically impossible to operate the whole circuit on a continuous basis. Rather, they foresee benefiting from EDI links with all their suppliers in order to reduce the number of orders issued “directly” and increase the number of orders “from stock”. This runs counter to the expected effects of information networks on the logistic model, but does correspond to what can be seen

elsewhere.[10] The idea is to reduce the quantities of a product in stock by optimising supply and to use the space saved to increase the number of products stored so as to be able to respond more rapidly to demand by benefiting from in-house logistics of known quality. For specialist mail order distributors, for example, this development should ultimately enable them to deliver any product ordered in less than 24 hours.

From the store to the shopping mall: affiliation and a new strategy

Internet technologies also offer the opportunity to broaden the supply side by linking the site to product suppliers or to additional services. The system is simple: hypertext links are inserted in a catalogue to incorporate supplies processed and managed by others. All retail distribution sites and many e-commerce Internet sites use affiliation systems to launch their first offer on the Internet. Affiliation links mainly are for offers of books, holidays and computer equipment, products and services for which e-commerce via the Internet is already well established and which serve as loss leaders. For the affiliated enterprise, this is a way to extend its supply to encompass products for which the logistics are outside its control. At the same time, it allows the initial supplier to develop a veritable backup network which enhances its visibility and accessibility on the Web. Alapage.com and Marcopoly, two business start-ups born on the Internet – one specialising in book distribution and the other in domestic appliances – have developed this affiliation strategy. In August 1999, Alapage.com celebrated its 1001st affiliate.

This practice breaks with a traditional approach in which distribution encompasses supply both theoretically and in terms of organisation and cost. Theoretically, for the affiliate distributor, “distributing” simply means selecting and giving exposure to an offer by accommodating it on its site. This approach is closer to the shopping mall than to the store. Moreover, the cost of incorporating new offers is practically zero. The direct link between the affiliate site and the initial site allows the initial supplier to receive and process orders automatically with no intermediary other than the medium of the site and the network. For the affiliate, this additional offer involves no transactions, organisation or additional work apart from selecting and negotiating with a supplier. The only traces of the transaction are a record of the transaction and a commission paid by the initial supplier to the affiliate as a function of sales (5-7% of sales). With this system, traditional distributors can capitalise on their experience in selecting products and suppliers as well as their reputation and their own site at very low cost and with practically zero risk and investment (physical, financial or logistic).

Electronic commerce and competitive market strategies: pharmaceuticals distribution

In pharmaceuticals distribution, the main economic and organisational impact of the growth of e-commerce via the Internet is not really due to disintermediation or rationalisation. In this sector, distributors already have an effective logistic system, so that they need not be concerned about the development of direct links made possible by the Internet between pharmacists and the laboratories. In fact, the three main distributors are not concerned about pharmaceuticals distribution but about the supply of non-prescription medical products and other products sold in pharmacies, an area which mass retailers and specialist distribution channels have recently entered. Traditional distribution to pharmacies does not necessarily have a price advantage over the new competitors. It does, however, have three strong points: its scientific appearance, the quality of its service and its logistics. It is these three qualities that OCP, the market leader with 40.5% of the distribution market, has decided to emphasise by creating OCP Point: an ordering platform accessible via an extranet and reserved for pharmacists.

The Internet is not undermining traditional drug distribution

Drug distribution in France has three basic characteristics that protect distributors from the effects of disintermediation and change felt elsewhere. It is a stable market; tight control by public health legislation preserves it from foreign and intersectoral competition; rationalisation strategies have already played their part with computerisation of the sector by EDI (upstream) and videotext (downstream).

The main players in pharmaceuticals trade are drug manufacturers, distributors and pharmacies. Distributors are thus at the centre of the logistics circuit from laboratories (350) to pharmacists (about 22 500). The 203 distribution centres employ 14 000 people, process 630 million orders a year and post a turnover in excess of FRF 81 billion. Three groups share this market: OCP with 40.5%, Alliance Santé with 29.7% and CERP with 25.6%. These market shares have changed little over the last five years.

Pharmaceuticals distribution is highly regulated. In France, "consumers" of prescribed drugs are reimbursed part of the cost by Social Security agencies. These drugs must have marketing authorisation and are sold at a set price negotiated between the *Commission économique du médicament* (drugs commission) and the laboratory and can be distributed only through pharmacies. The law also requires distributors to supply all pharmacies in France within 24 hours and to stock 90% of the "reimbursable" drugs, or about 35 000 products. Each distributor must carry at least one month's stock. Pharmacies are located throughout the country on the basis of a quota that depends on the local population and the number of existing pharmacies. Pharmacists (the manager and staff) must be graduates of university pharmacy departments.

This concentrated market structure and regulatory control have encouraged the emergence of an overall information infrastructure which links pharmacies to manufacturers over two standardised networks: EDI upstream between distributors and manufacturers, and videotext downstream between distributors and pharmacies. At the distributor level, these networks are supplemented by automatic systems for processing orders and monitoring stocks. Some 80-90% of orders go through these networks. Pharmacists transmit orders to distributors three or four times a day; deliveries take place at a similar rate. The introduction of the downstream network led to an overall drop in stocks and ordering costs, which Caby and Jaegger (1997) estimated at 60% over ten years. New added value services for pharmacists have been created on the basis of aggregation and processing of the data provided by the system.

The Internet and competitive strategy: the distribution of non-prescription medical products and other products sold in pharmacies

The advent of e-commerce via the Internet cannot disrupt either the established organisation or the economy of the sector, at least as regards drugs. However, drugs are not the only products sold in French pharmacies. Traditionally, they have also distributed a whole range of non-prescription medical products and other products (*parapharmaceuticals*) which do not appear on the official list of drugs.[11] The competitive situation is different for these products. Their prices are not fixed and their sale is not controlled by law. This segment has recently seen the arrival of foreign manufacturers and wholesalers that sell their products in France via the Internet, as well as pharmacists' purchasing groups that use the Internet to negotiate directly with manufacturers. It is not the new arrivals that present a danger for the distributors, because their own logistic systems are too advanced to be threatened by these new organisations. The real competition comes from the chains of specialist stores and mass retailers that have recently entered the market. They compete directly with pharmacies and do not use the services of the distributors; they form their own links with the laboratories and use their own logistic systems to supply their stores. Non-prescription medical products and other products account for nearly 50% of turnover in pharmacies.

A strategic network: the OCP extranet

Hence OCP (40.5% of the market) decided to use the Internet to develop added value services to improve the quality of services offered by pharmacies over those offered by mass retailers and specialist chains. It has developed OCP Point (Box 5), available only to pharmacists from an ordering platform accessible via an extranet. It has a central interface between the ordering system and the OCP stock control system to which information on drugs and the pharmacy trade is added. The platform is similar to that of the Gehe group (the second German distributor of pharmaceuticals) of which OCP is a subsidiary. Gehe had developed this scheme with a view to strengthening its client-supplier links. The underlying competitive aim is to draw in clients by offering attractive ancillary services and reach the more dynamic and competitive pharmacists while avoiding price competition. Developing an extranet service seemed to be the most effective way to pursue this strategy: low equipment and user costs, multimedia capability and a positive image, with entry limited to members.

Box 5. An extranet between a distributor and pharmacists

OCP Point is not a public Internet site. It is an ordering platform accessible by extranet which is available only to pharmacists and which should replace an earlier ordering system using modems.

OCP Point sets up an ordering interface with direct access to the stocks of the local distribution warehouse used by the pharmacist. The latter can then send orders directly via the Internet while verifying that the drugs needed are available. OCP Point also incorporates an interface with existing stock management tools, so that pharmacists do not need to re-enter orders. Invoicing is done independently. Pharmacists identified as clients have an account that is debited and they receive an overall invoice at the end of each month. They can check the balance of their account at any time by consulting the OCP Point site. This service should ultimately provide an invoicing history. It also provides information services on legislation relevant to the sector, drugs and their effects, scientific research, the method of organising and running a pharmacy, marketing advice, and so on. OCP Point also establishes links to other sites such as those of the Pasteur Institute and the Ministry of Health.

For pharmacists to access these services, they must be subscribers and suitably authenticated. This technical approach has been made possible by the recent tolerance, on the part of the authorities, of the use of encryption on the Internet. Both the service and the subscription are free of charge. In practice, however the pharmacist must still pay FRF 80 a month for access to the “Click a Doc” drugs database which provides data on 35 000 products and without which most of the functions of the service would be meaningless. This data bank is not new: it already existed and was sold in the form of a monthly CD-ROM. OCP Point is accompanied by an attractive hardware offer for a multimedia PC for FRF 5 000, under a global agreement concluded with Global Santé and Compaq.

In May 1999, after OCP Point had been available for less than six months, 600 pharmacists were subscribers and on line.

Source: Benghozi and Faverie (1999).

The new OCP service brings together, at a single location and from a single terminal, functions previously accessible from a variety of sources and systems: magazines and information brochures, CD-ROMs for drug databases, a Fahrenberger card transmission system for sending orders, the Minitel as a source of general information (notably a legal database on pharmaceuticals) and data on product availability, and again the Minitel for acknowledgements that orders had been received.

The project was launched without a business plan or any real economic evaluation of the project's potential financial benefit to the enterprise. Its objectives were more strategic than economic: to allow OCP to retain its position as an intermediary and its market share by helping to defend its traditional clients, the pharmacists, who were seriously affected by the advent of new competitors. Moreover, the time was ripe, as existing procedures (ordering through automatic reading of Fahrenberger cards, acknowledgement of receipt by Minitel) are obsolete. In addition, most health professionals now expect to use this type of network. OCP therefore sought to strengthen its position by anticipating change and making OCP Point an unavoidable portal site.

II. DYNAMICS OF DIFFERENTIAL DIFFUSION

Different technological choices according to the transaction

Business-to-business electronic commerce is expanding in many ways. Traditional EDI systems using added-value networks and Minitel business-to-business sites have recently been joined by the Internet or extranets.

Business-to-business transactions that use the World Wide Web can be grouped into three different categories: open commercial sites (open to the largest number), Web sites reserved for partners, and federating sites. The open of commercial Web sites are defined in the same way as those aimed at final consumers. They are on-line shops like that of CAMIF *Collectivités et Entreprises*. Businesses that open sites reserved to partners use the Internet for exchanges of the "EDI-light"[12] type to supplement their traditional EDI. These are usually Web-EDI or Web-EFI sites for ordering or transmitting orders like those created between La Redoute and its partners. Access requires an entry code and, like EDI, is conditional on recognition of the firm as a partner (client or supplier) and on the use of common procedures. Finally, there are Web sites that act as intermediaries and link supply and demand sides. These are venues for encounters and exchange or clearinghouses, such as the freight clearinghouse opened by Éditions Lamy.

Like intranets, extranets have borrowed their technology from the Internet. The intranet is internal to the enterprise and operates on networks that do not communicate with the exterior. The extranet on the other hand communicates with partners outside the enterprise using public networks, but it is protected by "firewalls". Access controls not located in the protocol make it possible to retain closure and confidentiality at the highest network levels and to adapt each type of electronic link to the characteristics of the transaction. The infrastructure no longer needs to be proprietary for the service to be confidential. This is why increasing numbers of business-to-business transactions take place through the Internet.

Three main factors are involved in choosing among these approaches: the position of the transaction in the production process, the strategy of the dominant player and *en route* dependencies.

Position of the transaction in the production process

Transactions between businesses can be subdivided into three main categories:

- Final sale transactions concerning finished goods purchased for consumption by businesses.
- Transactions included in a production process: these cover products brought in to be processed or assembled and then resold.
- Transactions forming part of an intermediate distribution process: these cover finished products purchased for resale.

The first category, which includes supplies, office machines and general information, usually employs commercial Web sites – Internet shops open to all, as in the case of CAMIF *Collectivités et Entreprises* (www.camif.fr). Before the advent of the Internet, this firm distributed these products and its services by means of catalogues sent by mail or given to clients by salespeople. Discussions took place face-to-face, on the telephone or on paper. The Internet commercial site has decision aids, estimates, contracts and means of communicating with the sales team; it should ultimately replace the use of paper and telephone and serve as a demonstration system and sales tool for salespeople. On the supply side, these sites are leading to the implementation of new business models such as Dell's, which at first sight do not appear very different from those of public commercial sites. Clients' purchases are not linked to production and the production cycle and take place with suppliers that differ greatly from one another and over time. Such transactions are highly dependent on clients' ability to set up the decentralised organisation and logistics necessary for managing purchasing. The development of this type of transaction is also linked to the evolution of legislation that governs trade.

The second and third categories concern intermediate transactions, which are very different from the first type in that they are integrated in a value chain. Goods enter a cycle that should be seamless and results in management in terms of flows and stocks. According to certain sources, these categories would not lead to the largest number of Internet transactions (10-20%) but would produce the greatest value (70-90%). These two categories differ from one another in the source and form of the added value involved in the transaction. In the second category, transactions form part of a process of added value creation linked to the production or modification of a product. For example, La Redoute arranges transactions, via an EFI Web site, between those who sell textiles and those who make various articles for them. In the third category, the transactions are solely intermediary (logistics and distribution). This category covers activities such as those of the purchasing centres like GALEC, book distributors like Livredis and Inter Forum, subsidiaries of Havas Service, and drug distributors like OCP. The EDI Web, the EFI Web or the extranet supplement the existing information structures – traditional EDI – without necessarily undermining them. Indeed, certain enterprises plan to extend their EDI using added value networks of the Allegro or Transpac type as they expand their use of e-commerce for buying and selling over the Internet. These firms tend to prefer EDI solutions when flows are substantial, transactions recurrent or strategic, and inputs dedicated.

These results bear out the relation pointed out by Williamson (1975) between the nature of the inputs and of the transaction and the technological choice of the electronic link. These approaches vary according to the position of the transaction in the production system, the extent to which the input is dedicated, transaction volumes, confidentiality of the transaction and business uncertainty and position with regard to risk. The more the electronic link is closed and specific, the more the transaction is customised, difficult to measure, exchanges are frequent and the degree of uncertainty high. Conversely, the electronic link may be open when the asset is generic (including no secret, strategic or new information), when the transaction is remote from the production process and when the flows exchanged are measurable (it is necessary to be able to put a price on the transaction) and the exchange is occasional.

Table 4. Categories of business-to-business e-commerce: a trial taxonomy

	Types of product	Characteristics and trends	Technological choice	Specific obstacles
Final sale to enterprises.	Computer software and hardware Information, advice Books Travel Office supplies	Commerce between sectors. Electronic commerce trends: • Move to all-electronic systems (choice, signature, contract, payment, etc.) • New business models.	The Internet replaces other media: paper catalogues, telephone, fax, appointments with the salesmen, Minitel.	Sales organisation must evolve, be simplified and decentralised. Problem of trust, legal recognition of electronic signature on the contract and of proof.
Sale of intermediate products bought in for processing or similar.	All intermediate products: • Raw materials • Semi-finished products • Segments	Commerce in sector value chain. Exchange of transaction information: orders, invoices, etc. Management in terms of flows and stocks.	The Internet (EFI Web) complements EDI. Replacement of paper catalogue, mail, telephone, fax.	No specific obstacles: there are problems of costs of use, low level of computerisation of SMEs, security and reliability of networks and transactions.
Sale of finished products bought for resale.	All finished products.	Sectoral commerce (specialist retailers like pharmacies and bookshops). Intersectoral commerce (mass retail). Management in terms of flows and stocks.	The Internet complements EDI. Replacement of paper catalogue, mail, telephone, fax and Minitel.	Links to development of e-commerce for final sale ⇒ reorganisation of logistics, creation of know-how.

Source: OECD.

Market strategy and electronic links

The use of proprietary or closed networks like extranets can help strengthen market power by creating lock-in effects, by increasing switching costs, and hierarchical effects, by reinforcing information, order and control procedures, or by creating specific or dedicated inputs.

En route dependencies

Like any instrument, information technologies generate knowledge, procedures, organisations and development that cannot be challenged without delays and switching costs. They tend to create development opportunities and constraints (Nelson and Winter, 1982; Teece, 1982) that cause an enterprise to develop along a specific path and explain why entrepreneurs in a given sector, faced with the same

developments, do not react in the same way or introduce the same innovations. The development of electronic commerce is not proof against this dependency effect (Greenstein, 1999).

Different diffusion trends in different sectors

Digitisation of products and services varies

In a sector where the products traded have a usage value which depends on their ability to be digitised (information, intellectual added value), e-commerce, whether business-to-business or business-to-consumer, develops more rapidly than in other sectors. It is the case for book publishing. The effects of electronic commerce on its organisation, economics and regulation are much greater. The digitisation of the product traded undermines the established organisation, economy and positions.

In all other cases, the Internet can be used for commercial exchanges that govern the physical transaction: choice of product, discussion of prices and delivery times, ordering, following up orders, payment. For such exchanges, the Internet tends to replace the fax, telephone, Minitel and mail, but not necessarily EDI.

Pre-existing technologies

Use of the Internet as a medium for business applications varies considerably among sectors, partly as a function of the technologies already in use (legacy technologies), but also according to the size of the firm and the extent to which it is computerised. The more highly computerised a sector, the simpler it is to develop its transactions on the Internet. The more a sector uses EDI, the quicker it can move to the Internet, but the less important the Internet will be to the sector's activity and organisation. A sector that is less computerised will clearly move more slowly, but Internet business applications will be more numerous and more extensive. The Internet facilitates the introduction of EDI solutions (of the "EDI-light" type) in sectors where such exchanges are not well developed (Box 6).

Box 6. EFI Web, EDI, Minitel, fax and telephone: complementarity and substitution[13]

Mail order distributors use EDI systems with 30% of their suppliers. Those introducing systems of the Web-EFI type aim to use these new technologies to extend EDI to all their suppliers and thus replace fax, telephone and mail.

Distributors in retail distribution use an EDI system with 75% of their suppliers; the EDI Web and EFI Web should allow them to extend EDI to all their suppliers and replace fax, telephone and mail.

On the Dilicom publishing exchange platform, EDI is used by nearly 65% of distributors and 13% of bookshops. Nearly 70% of messages from bookshops arrive by Minitel. The manager of Dilicom expects that in the near future 50% of these messages will come via the Internet.

In the pharmaceuticals sector, the OCP extranet already has 16 000 client pharmacies that should ultimately use the Internet instead of the Minitel.

Every business interviewed predicted that their Internet budget would grow.

Source: OECD.

Market structure

The spread of the use of the Internet and of e-commerce via the Internet varies considerably among sectors according to the way in which projects are organised. There are communal strategies and individual strategies. The choice of strategy is frequently linked to the market structure, the project originator's position in the market and supply-side characteristics.

In the publishing sector, for example, bookshops deal with a fairly limited number of distributors (less than 100) but tend to offer an exhaustive list of titles. Yet, distributors are not wholesalers and distribute only part of what booksellers offer: they tend to have links with one or a few publishers. This and the virtual absence of wholesalers force bookshops to deal with almost every publisher and distributor. In addition, distributors and bookshops do not negotiate prices, since these and the distribution of profit are determined by the Lang Act on the basis of the price set by the publisher.[14] This situation is undoubtedly the reason for this sector's interest in a collective EDI system and the ease with which it came into existence, with the establishment in 1989 of EDI Edilectre (the old name of Dilicom), which, at least in theory, allows all bookshops to use the service so long as they have at least a Minitel. At the other end of the network, Dilicom's services are used by 65% of distributors. As a result, a bookshop like Fnac passes 99% of its orders by EDI and all bookshops, even the smallest, can access the platform using inexpensive systems like the Minitel or the Internet. However, the spread of electronic commerce is encountering an obstacle in the shape of bookshops' very low level of computerisation. A major absentee from this community is the Hachette group which has nearly 30% of the publishing and distribution market. It continues to use customised systems (EDI, Minitel or the Internet) which are accessible to bookshops but not to its competitors, in order to protect its market share.

The retail distribution case studies differ from those in publishing insofar as the focus is generally on upstream links between distributors and suppliers. Downstream links between distributors and stores were of course already organised on the basis of private internal systems and EDI on a value added network. Distributors in this sector deal with a large number of suppliers (several thousand) some of which are small or geographically distant. Most are common to the various distributors. The distributors build their supply (with several thousand items for each client) by contacting suppliers. Hence the idea of supplementing existing EDI systems by setting up ordering systems using a community type EFI Web (see Box 7).

Box 7. EFOVAD - Development of a community EFI Web approach

The EFOVAD (*Échange de données informatisées entre les fournisseurs de vente à distance* – computerised data exchange between distance selling suppliers) association was set up in June 1992 at the initiative of La Redoute. It seeks to develop and promote standardised EDI between mail order firms and their suppliers. At present, the association has 67 members: the mail order and distance selling federation, four distributors (La Redoute, CAMIF, Manutant and Quelle) and 62 suppliers.

In 1998, EFOVAD created a suppliers' Web site, the objective being to extend EDI to all suppliers.

In terms of the operation of EFOVAD's EFI Web site, the distributor sends purchasing orders by "standard" EDI. After appropriate translation, the orders are placed on an intranet server. Suppliers access this server via the Internet, where they can read the order and import the documents necessary for sending the products to their microcomputer and print them out. In return, the suppliers acknowledge receipt of the order and confirm shipment on the EFI Web server. The data are then sent to the distributors after translation into standard EDI format (the EDIFACT standard).
Source: EFOVAD.

In the pharmaceuticals sector, the transactions most affected by the Internet are not upstream links between manufacturers and distributors, who already use EDI, but downstream transactions between distributors and pharmacists. As in publishing, retailers are independent from distributors. However, as in retail distribution, distributors control the supply. This means that the pharmacist does not need to contact several suppliers for his stock. In addition, there is no price competition. Distributors therefore must develop other types of advantage, such as introducing an electronic link and offering value-added services. This is why a firm like OCP has no intention of opening up its extranet to its competitors.

The introduction of centralising bodies and projects like those of Dilicom in publishing or EFOVAD in mail order distribution has two kinds of effects. The first is to increase diffusion by sharing the investment necessary for introducing and using the systems and by creating and diffusing information about their uses and effects. The second is to nullify the competitive advantage and strategic effect of locking the system by standardising the procedures necessary for its use by a community of competing partners. The electronic link is then more operational than strategic.

The choice of individualised strategies usually leads to closed Internet use (access reserved for a few members, extranet, etc.). Such strategies are frequently used by market leaders and are justified either by the nature of the transaction (involving a confidential or dedicated input for example) or by the firm's strategy to protect its market share by not sharing the benefits of the electronic transaction with competitors. The electronic Internet link makes it possible to shut out competitors and to lock in suppliers and clients, whereupon it becomes more strategic than operational.

E-commerce projects remain fragmented

The case studies carried out for this report show that there are many and varied business-to-business uses of the Internet. However, in France and in the rest of Europe, enterprises are still at the hesitant learning stage with regard to e-commerce via the Internet[15].They adopt solutions for extremely diverse economic and strategic reasons on the basis of initiatives that, at least at present, often seem localised and scattered. Incidentally, the managers of these enterprises see this as a good thing. Such initiatives allow for the introduction and testing of new strategies and solutions, usually at low cost. They also lead to hands-on learning processes and the natural selection of skills. According to Orlikowski (1999, p. 15): "Technology must be used to have effect and such use is varied, embedded and emergent." As a result, information about these different uses and their economic and strategic implications is, as a rule, as dispersed as the initiatives themselves, as there does not yet appear to have been an overall appraisal in terms either of investment or results.

Table 5. Trends and obstacles to the development of business-to-business electronic commerce: sectoral and international differences

Factors	Assumptions concerning effects of B-to-B electronic commerce via the Internet
Nature of the product	• Digitisable →enhances development of business-to-business electronic commerce. Most important effect = disintermediation • Non-digitisable →development of EDI for transactions →rate of development linked for example to rate of development of logistics
Degree of computerisation of enterprises	• Computerisation → enhances development of Electronic commerce
Existing technologies	EDI • EFI Web = complements EDI • ↗ EDI = ↗ EFI Web Minitel • Web = replaces Minitel • ➦Minitel = ↗ EFI Web Note: the network effect initially hinders (hardware and services already in place) but facilitates transition once decided.
Nature of transaction	• Recurrent, strategic, dedicated input: ↗ preference for EDI • Occasional, routine, generic input: ↗ preference for Internet solutions (EDI Web, EFI Web)
Firm size	• No obvious link between size of firms and b-to-b electronic commerce. • Phenomenon 1: the figures show[16] that large firms are better equipped than small ones even for the Internet and Web sites. • Phenomenon 2: smaller firms have no EDI and should therefore have a strong tendency to use the Web. Here again, EDI/EFI Web complementarity. ↗ size = ↗ facilities and use of EDI and Internet media
Market structure	Fragmented market • Large number of small firms • No influence on organisation of market or trade • No EDI = ↗ development of replacement Internet solutions (for example in textiles) Monopoly or oligopoly market • Large firms • EDI already developed = ↗ development of complementary Internet solutions (for example, publishing) International market = ↗ development of Internet solutions (textiles)
Strategy of dominant firms	• Operational strategy: the aim is to rationalise exchanges for transactions with the maximum number of the firm's partners, suppliers and clients. → tendency to introduce open Internet systems (Internet sites). • Market strategies: the aim is to automate exchanges and offer after-sales services to clients and suppliers but excluding competitors. Tendency to introduce closed systems (extranet sites).
Organisation of the sector	• Sector strongly federated by trade organisations (book publishing for example) → EDI highly developed → introduction of a collective approach. • Sector not federated → introduction of individual solutions.

Source: OECD.

III. IMPACT ON MARKET STRUCTURES AND COMPETITION

It is generally believed that using the Internet to buy and sell is bound to enhance competition and benefit the final purchaser. This belief is based upon two assumptions. The first is that an open, standardised worldwide infrastructure needing only inexpensive access systems reduces transaction costs. This should widen the market, reduce the effectiveness of hierarchies, enable consumers to avoid intermediaries and thus lead to almost perfect competition. The second assumption is that the move from a supply-driven to a demand-driven approach, based upon improved knowledge and with production adapted to demand, should give the consumer more market power (Smith *et al.*, 1999). These assumptions are sometimes borne out. However, a number of elements that appeared in the course of the research for this study suggest that there is scope for discussion and for putting them into perspective by showing what might work against the competitive effects of Internet mediation.

The Internet, markets and hierarchy

According to a strict application of the theory of transaction costs (Williamson, 1975), the use of electronic mediation and processing should make hierarchies less effective and lead to a tendency to externalise activities and make greater use of the market. This is the view of Malone *et al.* (1987) who expect hierarchical effects to diminish as networks become more standardised. At the same time, the hierarchical and centralised organisation of enterprises should gradually be replaced by a model in which decision-making and control are decentralised and linked (Malone, 1997).

The Internet and externalisation

Externalisation of certain activities linked to the introduction of Internet services, computer services and specialist services when creating and maintaining Web sites has been observed. However, the reasons behind this externalisation are as much uncertainty, rapid development of information technologies and the need for frequent renegotiation and changes of partner as any mediation made possible by the Internet.

The Internet and hierarchies

It has also been observed that all electronic links via the Internet do not lessen hierarchy. The use of certain electronic links via the Internet, like EDI light or the extranet, to replace paper and telephone transactions results, for example, in links that seem more hierarchical than competitive. None of the enterprises interviewed said that they use these applications to open up the market to more suppliers or to new partners. The aim is to rationalise links that already exist and to incorporate them into an automatic ordering and information system with a view to creating seamless sourcing for the supplier and to reduce the stocks held by the distributor. Common protocols and automatic procedures help strengthen links between producers and suppliers by adding to the control systems each partner has set up. Accordingly, the introduction of these EFI or EDI Web sites leads not to a wider market but to more hierarchy.

To conclude that hierarchy is diminished by use of the Internet in client-supplier relationships would require either verifying that services and functions are externalised or observing that existing EDI links were replaced by electronic markets or by more open systems of the EDI Web or the EFI Web type. However, such a transition has not been observed; rather, there has been a move from certain physical markets to electronic markets, with Internet transactions replacing those involving paper, telephone, fax or Minitel.

Therefore, the distinction made by Malone *et al.* (1987) between the electronic market and the electronic hierarchy seems inadequate for organising the entire range of electronic links. As pointed out by Ciborra (1993), a large number of organisational forms are growing up between these two poles. The extent of their competition or hierarchy is not solely linked to the nature of the network and the organisation of the infrastructure; a network is a medium; and hierarchy, control and power depend on the relationship established between the partners by this medium, by market structures, input and output procedures, investments and contracts. The choice of the medium is important in a commercial relation, but it is not the only factor that structures trade and defines the powers of negotiation within it. Other things being equal, irreversible costs and transition costs are probably lower on the Internet than in any other medium, whether electronic or not, but the procedures, contracts and hardware and software investment generated by a partnership relationship tend to create lock-in situations. This effect is not linked to the network itself, to the fact that it is proprietary or open and standardised, but to the fact that any network creates or strengthens a relationship of control and order. To interpret a market situation, it is not enough to examine the choice of the electronic infrastructure.

This outcome confirms the results of studies carried out in France on the Télétel (Steeter *et al*., 1993) which show that a standardised and open infrastructure does not suffice to make transactions open and that even on a non-proprietary network, electronic links related to production tend to be organised on the basis of hierarchical rather than market links. Hierarchies do not exist only because they are more efficient than the market in terms of transaction costs, but also for strategic reasons: to lock suppliers and clients into a relation of safeguarding or creating a rare or strategic input, or even of co-operating (Johnston and Lawrence, 1998; Powell, 1990).

Disintermediation versus re-intermediation

The postulation of a direct market without intermediaries (described notably by Wigand and Benjamin, 1995) can be put in context thanks to empirical data and the results of theoretical studies showing that if electronic intermediation via the Internet leads to the disappearance of traditional intermediaries, the development of electronic markets brings forth new ones (Kannan *et al*., 1999; Petit, 1996).

It is not, however, a question of substitution. The functions are not necessarily the same. To take the example of publishing, the use of electronic networks in this sector is tending to eliminate the traditional circulation and distribution intermediaries, which are not replaced. Their functions are internalised by publishers. New arrivals on the scene produce information services or information transmission services. They come from technical fields outside the sector, such as computing or, more frequently, credit card processing, and are becoming integrated into the field. They develop specific value-added services.

The existence and activities of these new intermediaries have an impact on competition and market power relations. Most of those whose function is to select, combine and circulate information, like the freight clearinghouse set up by Éditions Lamy, increase the amount of information available to competitors and consumers, and this should make sellers relatively less powerful. As regards those

introducing EDI-light systems, for example, everything depends on who runs the system. The intermediary provides clients with value-added information services on its clients or suppliers, together with automatic monitoring systems, and so increases its market power over that of its partners. Changes in market power are highly dependent on the pre-existing market structure and the extent to which the intermediary is dependent on or independent of a particular player.

Markets on the Internet and new entry barriers

New international marketplaces are being created on the Internet, which are open to more buyers and sellers than physical markets and supposed to be more efficient in terms of competition, price elasticity and reduced transaction costs (Smith *et al*., 1999). The falling costs of access, hardware and communication, and the standardisation of protocols, are helping to make markets wider and more open. Also involved are all the techniques that facilitate access and selection of sites and information, such as search engines. However, the question arises as to whether Internet markets are actually more contestable (Baumol *et al*., 1982) than physical markets. To quote Bollier (1996, p. 40), "Developing an online service is not only a question of finding greater efficiency and improved performance at lower cost by increasing response time or effectiveness. It is primarily a way of establishing power and market domination capable of providing long-term competitive advantages." For the moment, the rate at which markets and services on electronic networks are developing is increasing competition. It is shaking up established industry and markets by making it possible to offer cheaper replacement products and services and products with higher added value. However, from a dynamic point of view (considering market changes over several time periods), it is uncertain whether using the Internet is in fact making markets more contestable. The weapons and the approaches are changing; the economics and the strategies are different, as are the ways of creating a dominant position. While the need to possess substantial physical assets (production and distribution channels) to achieve equilibrium has long constituted a barrier to entering traditional markets, the effects of positive network externalities and of lock-in, as well as the problems of visibility and the extent of investment in advertising and re-engineering, could have the same effect on the Internet markets (Varian, 1999).

The positive externalities of networks: visibility and first-mover advantages

Positive network externalities refer to the fact that the utility of a product or service increases as it is circulated to a greater number of consumers (Katz and Shapiro, 1985). They may be direct (as in the case of the telephone) or indirect, by facilitating the adoption of a service or technology (Rosenberg, 1982; Cowan, 1991) as well as its supply (Lelbeinstein, 1950) and the supply of complementary products (Chou and Shy, 1990). With regard to services on the Internet, positive externalities on the supply side are linked to economies of scale and, on the demand side, to effects of image and reputation. The greater the information content of the product or service, the more important these effects. Indeed, a specific feature of information is that although it is costly to produce, it can be reproduced practically free of charge. Accordingly, the marginal cost of supply tends to zero, and the effects of value increases related to reputation and diffusion do not encounter any real limits due to size or productive or distributive capacity.

At the same time, the Internet is experiencing growing problems of visibility and accessibility to services and information. A contrary effect of its development and of massive inputs of information is that information is lost. "Realtors always say that the value of property depends on three factors: its location, its location and its location. Today anybody can create their own Web page ... the problem is then to get oneself known" (Shapiro and Varian, 1999). If a service is to be visible and accessible, it must be present at practically unavoidable points in the network, such as search engines, access providers or certain publishers. In fact, there are few of these and space on them is expensive. The Amazon.com bookshop, the

overall leader as regards presence and reputation,[17] reached an agreement in 1998 with AOL that apparently cost EUR 19 million in order to advertise to 8 500 000 subscribers (Shapiro and Varian, 1999, p. 12).

Also, banner ads are gradually yielding to affiliation strategies that sometimes lead to exclusivity contracts. Related product effects as well as the lock-in effects of the installed base then appear between affiliated services and portals.

As already pointed out, these effects of positive network externalities – related products and lock-in that combine to give advantages to first movers – are present in every sector and for all services, and this should encourage firms to increase their size and market share, to merge and to create international oligopolies and thus to make access to their market more difficult for small and medium-sized firms. However, as Baumol *et al*. (1982) have shown and Shapiro and Varian (1999) have recalled, the principle of contestability is not linked to the number of actors in a market but to an actor's capacity to abuse his dominant position. In the case of products and services with a high non-digitisable content, positive network externalities are limited by productive and logistic capabilities as well as by the existence of geographical and temporal barriers.

The importance of logistics

The Internet is not just another distribution channel, it is also a market where a new distribution economy is taking shape. It must be remembered that the ways in which added value is turned to account in the virtual and physical worlds are not the same. Quite apart from the investment in advertising and visibility that any enterprise must engage in, something that is less costly for a firm which already has a well-known name, a traditional enterprise developing its activities on the Internet must first of all redesign its supply side and undertake a reorganisation that requires high tangible and intangible investment. "Brynjolfsson looked at how the market evaluated different types of investment. If an enterprise invests one dollar in plant or equipment, its financial worth goes up by one dollar. If it invests one dollar in information technology, its worth increases by seven dollars. He explains that for every dollar invested in information technologies, six others are needed to make the most of them (in software, the organisation of work, etc.)" (Shapiro and Varian, 1999).

Firms offering tangible products such as books in paper form, mass retail products and pharmaceuticals must also invest in stocks, transport and logistics. The spread of electronic networks does not eliminate stocks, as illustrated by the increasing number of Amazon.com warehouses, but electronic commerce requires developing the logistics. Moreover, along with the development of e-commerce, there is growing competition with respect to the quality of the logistics, which forces those involved to internalise this segment (see the section on new logistics organisation above). In the emerging information economy, where not all goods and services are or can be digitised, the quality of logistics (from procurement to delivery) is becoming a basic strategic issue, a sensitive spot in the distribution channel and probably a new generator of added value.

The traditional distribution firms studied see this as an opportunity to profit from one of their strong points. Thus, they try to improve these functions, which are at the core of their business, using traditional EDI or the Internet. Their logistic systems are not initially adapted to the new electronic commerce, but they understand the work and the necessary platforms and channels are already in place.

At present, distribution is still organised in the classic manner with purchase control, large stocks and long delivery times. This puts start-ups like Marcopoly and Alapage (see Box 8) in a difficult situation, and means managing the interface between a new sales model (highly reactive, small quantities, a great

variety of products) and a traditional distribution model (low reactivity, large quantities, selected products). The necessary investment and reorganisation are hindering new entrants and affecting outcomes.[18]

Box 8. Marcopoly and Alapage: the logistic problems of new sales models

A surprising result of the case studies carried out for this report is that some new business models for selling via the Internet organise their logistics like their physical competitors: the same electronic networks and the same physical supply systems.

Such is the case for Marcopoly and Alapage.com. Marcopoly is a new distributor of domestic appliances, which was created on the Internet in 1997 and still exists only there. The original idea was to profit from Web server technologies to offer a comprehensive range of goods and tools to enable consumers to compare products and make their choice objectively. Alapage, created on the Minitel in 1987 and then on the Internet in 1997, is a virtual bookstore (see Annex 1).

These two actors have developed business models for on-demand end sales which run counter to the standard logistic model. Theoretically, their business is demand-driven: they carry little or no stock, order products individually and have them delivered very quickly to their clients.

Thus, in a context where logistics are generally still supply-driven, these new business models risk availability and timing problems, which force them to create stock, thereby preventing them from benefiting from a large part of the competitive advantage promised by their model.

So far, these new business models do not have sufficient market share to be able to modify upstream business activity. They therefore have to innovate to meet the new demand. Alapage is seeking, together with wholesalers, to introduce a new distribution organisation, and Marcopoly is holding discussions with its main suppliers with a view to setting up EDI links enabling them to monitor and manage the supply/demand relationships in real time.
Source: Benghozi and Faverie (1999).

More power to the consumer?

Electronic markets and consumer power

An important question is whether the change from physical to Internet markets gives more power to the buyer. According to Williamson (1975), electronic trading is liable to reduce information assymetries and uncertainty by enabling purchasers to obtain information on all potential suppliers and their prices. As already pointed out, however, the Internet suffers from problems of visibility and of positive network externalities related to circulation and reputation.

It is interesting to look at electronic affiliation in the light of this issue (see the section “From the store to the shopping mall”). Electronic affiliation makes it possible for a given offer to be present on several sites. It increases the number of sites where the same offer is present but does not differentiate it. A site like Alapage.com claims to have over 1 000 affiliates in France. Not all affiliations are visible, as the name Alapage does not appear on certain sites. There is a great deal of such duplication on the Internet and it can give the illusion that there are many more offers and competitors.

Demand-driven business and consumer power

Research for the present study has revealed that e-commerce via the Internet is closely bound by the way that business is run, which is gradually changing from being supply-driven to being demand-

driven. This kind of organisation, which is based on the collection and processing of individual data (one-to-one marketing) or on particular consumer subgroups, should improve the quality of customer service, the offers received (direct marketing) and the fit between supply and demand. It should not only make the services more efficient but also increase the role of the consumer in negotiations. However, examples of the way in which individualised information is used show that it is also exploited by certain firms to evaluate and limit their risks, segment or even choose their clients (Wolley, 1998). This puts into perspective the assumption that the final consumer's power is increased.

Electronic commerce and competition

Three remarks on competition effects bring this chapter to a close.

First, using the Internet for electronic mediation does not necessarily open up the electronic market, as transactions over a network – even with standardised infrastructure – can be closed at the level of applications, procedures, contracts and investment. Thus, Internet transactions are not free of lock-in or hierarchical power effects. While new market places are created on the Internet, new forms of hierarchical co-ordination are as well.

Second, this study has shown that disintermediation is usually accompanied by re-intermediation. Furthermore, contrary to a widespread notion, intermediaries are not always neutral in terms of their influence on the market and competition.

Third, in terms of the assumption that there are no entry barriers to electronic markets, it appears that while barriers to entry in traditional markets (distance and geographical borders, communication and transport costs) tend to diminish thanks to Internet mediation, other barriers linked to positive network externalities, related product strategies and lock-in may be raised.

IV. CONCLUSIONS

The present cross-sectoral comparison reaches conclusions that are in line with those commonly reached on the establishment of electronic networks and market structures. Caby and Jaegger (1997) show that the effects of information technologies depend on the context in which they are applied and that there is no reason why these effects should be the same in different sectors. The present study shows that at the level of the firms in the three sectors examined, four main strategic trends appear but to varying extents and with very different impacts. The differences observed depend not only upon the nature of the products exchanged and the transactions, but also on many other factors, such as the existence of other technologies, market structure, the regulatory framework, the strategy of dominant firms, the laws governing business activity and the sector's history and culture.

Analysis in terms of transaction costs is insufficient to explain the technological choices made and the expected economic and organisational effects. The firms interviewed in the course of this study emphasised that hindrances or delays to entry are due more to the learning process, "second entry" strategies and investment in reorganisation than to the price of hardware and communications.

In terms of the impact of Internet use on market structure, it is clear that technical and economic trends related to the open and standardised international network are reflected in the appearance of new electronic markets, the extension of traditional markets to international level and the lowering of entry barriers, all of which increase competition. But the Internet economy is also generating other effects (such as network, brand name and advertising effects) that work against the tendency towards increased competition. These other effects working against increased competition are more important the more the product can be digitised or is lightweight, and the more the cost and organisation of logistics are relatively insignificant. They are less important if products or transactions cannot be digitised and physical activities (such as stock and logistics) carry a heavier weight in terms of quality of services and the competitive differentiation of firms.

It must also be borne in mind that the Internet's technical and economic characteristics and standardisation of the network do not eliminate firms' strategic capacity to close electronic links and incorporate them in forms of governance that are sometimes closer to hierarchy than to market competition.

Finally this indicates that business organisations and intermediaries offering information technology services play an extremely important role not only as regards the choice and diffusion of computer and communications solutions but also as regards their degree of openness and expected competitive effects.

Policy implications

Given the stage reached by electronic markets on the Internet in terms of innovation and learning, everything that constitutes a market is in the process of being defined and redefined: products, industrial organisation, trade and competition rules, the basis of regulation and legislation. The primary objective of innovating players is to define the market in their favour (Faverie, 1996). They do this by proposing and

assisting in the selection of supply close to their own technological trajectory; by segmenting the market to suit their purposes; by helping define the rules of practice (recommendations and proposals for organisation, standardisation, etc.). At this stage, the objective of the authorities is twofold; on the one hand, they must rely on existing dominance and technological trajectories to give impetus to market development, but, on the other, they must reduce the risks of abuse of market power by encouraging the opening of markets to the largest number of enterprises.

Encouraging the spread of e-commerce by mobilising business organisations

The results of this study suggest that the spread of electronic commerce and positive effects in terms of competition can be encouraged by policies based on sectoral monitoring, diffusion and access programmes worked out in co-operation with business organisations.

New questions concerning the established legal framework

The book publishing study in this report and many other sectoral studies show that economic, organisational and competitive trends linked to new business models and new uses of electronic commerce over the Internet make it difficult to apply existing regulations and question established legal frameworks in some industries.

Applying competition policies and anti-trust legislation

The study also demonstrates that the Internet, by its nature, does not automatically lead to more openness and competition and that the strategies followed by firms remain decisive. Although e-commerce is changing the industrial and commercial scene by accentuating some phenomena, such as the effects of positive network externalities, linked sales and lock-in effects, fundamentally economic rules and firms' strategies remain the same. This means that e-commerce via the Internet is opening up a new field for the application of competition policies and antitrust legislation without changing the essentials (Shapiro and Varian, 1999).

The need for further analysis

Finally, this study has raised a number of issues that deserve further attention:

Sectoral or national trends?

The first concerns differentiating and ranking diffusion factors and economic and organisational effects between those due to sectoral characteristics and those due to national characteristics. Part II of the study lists a number of key factors underlying the differences observed in book publishing, retail distribution and pharmaceuticals distribution in France. The present study of three sectors suggests that the way in which electronic commerce spreads and its economic and organisational impacts differ not only on the basis of the sector but also on the country in which the sector is located, given that countries' market structure, pre-existing technologies and market regulation and framework laws differ, as do their knowledge bases and competencies. For this reason representatives of OECD countries considered it worthwhile to pursue further sectoral studies, using a common methodology and a broader choice of sectors so as to compare sector and national results and test these assumptions.[19]

The role of the computing, telecommunications and banking sectors

The computing, telecommunications and banking sectors have specific roles in the development of electronic commerce, both business-to-business and business-to-consumer. They make great use of the Internet but are also solution providers. This and most other studies show that intermediaries in the computing, telecommunications and banking sectors play an important role in structuring and restructuring in other sectors, a role which it would pay to study more carefully.

Role and specific features of SMEs

This study says little specifically about small and medium-sized enterprises (SMEs), since the few that were studied were start-ups born with the Internet. The OECD is undertaking further work on the competitive use of electronic commerce by SMEs and issues specific to the impacts of electronic commerce on SMEs.[20]

ANNEX 1. SCOPE AND METHODOLOGY OF THE STUDY

Between February and September 1999, a set of case study interviews was carried out on distribution-related business-to-business electronic commerce in France. The scope of the study was relatively broad, since the first step was to construct and test a questionnaire that spanned the use of business-to-business electronic commerce as exhaustively as possible and to assess economic effects in sectors as different as publishing and retail distribution.

When selecting firms for the study, however, a contradiction appeared between the breadth of the subject and the limited number of cases the study could cover. The topic was therefore narrowed, using three criteria:

- The case studies should concern users of business-to-business electronic commerce.

- The firms selected had to have different products, market situations, levels of international activity and legal structures, in order to see how each element affects the use of business-to-business electronic commerce.

- The case studies, unlike most carried out in this area, should not concern only new entrants or innovators introducing new business models but also traditional firms established well before the emergence of computerisation of communications and the Internet, in order to see whether the different players competed or were complementary and to look at the effects of these relations on the sector's value chain and changes in the cost function.

On the basis of these criteria, 30 firms in retail distribution and mail orders (food and drink, clothing/textiles, furniture), publishing and pharmaceuticals distribution were contacted. Eleven were used for the case studies: five from book publishing, five from retail distribution (one firm, CAMIF, was used twice because of its different activities) and one from pharmaceuticals. Six were mail order specialists. The over-representation of mail order firms was due to the fact that they responded positively and more quickly than others, which reflects the importance for mail order sales firms of issues related to use of the Internet.

A major consequence of the positioning of the survey is that sites related to consumer transactions are not excluded, but the particular focus of the study is not how such sites sell things but how they buy them.

The case studies were conducted on the basis of interviews (one to five per firm) using a questionnaire addressing business-to-business electronic commerce on the Internet. Interview material was supplemented by sector-based data and published studies.

Three additional case studies were included of new business models, two in the publishing sector (00h00 and Cylibris) the Editions Lamy and Casino, a mass distributor, on the basis of press sources (without personal interviews). Of the firms in the case studies, ten were traditional firms, mostly large and long established in their markets (see presentation list on these firms). Five were much more recent, mostly

small, and created as a result of computerisation of communications and the Internet. They are briefly presented in Table 6.

The data collected were partial and do not give an exhaustive view of the situation of business-to-business electronic commerce in these sectors in France. A certain number of results were obtained, the interpretation of which remains subject to the quantitative and qualitative limitations of the sample.

It should also be noted that most of the Internet uses presented here do not fall within the narrow definition of electronic commerce, insofar as the vast majority do not result either in on-line payment or electronic delivery. However, they fit a broader definition, which spans all uses of electronic media in commercial transactions.

Table 6. Firms taking part in the study

Firms	Activity	Customers	Turnover MF	Employees
00h00[1] www.00h00.com	Digital bookshop. New business model.	Consumers	0.30	10
Alapage www.alapage.fr	Internet bookshop. New business model.	Consumers	27	40
CAMIF www.camif.fr	Retail distribution distributor with core furniture distribution business. In third place in France in terms of share of the mail order market.	Consumers	4 511[2]	1 916[2]
CAMIF Collectivités et Entreprises www.camif.fr	Distributor of office supplies and equipment by mail order.	Firms and local authorities	650[2]	170
Casino[1] www.c-online.fr	Retail distribution purchasing group.	Retailers and consumers	92 853	60 000
Cylibris[1] Www.cylibris.fr	Publishing on demand. New business model.	Consumers	0.25	5
Dilicom Www.edilectre.fr	Economic interest grouping for the implementation and management of an EDI platform, created by an association of book distributors and bookstores.	Book distributors and bookstores	7	4
Fnac Www.fnac.fr	Distributor of cultural products. Traditional bookshop and Internet bookshop. France's largest bookseller.	Consumers	13 969	8 925
France Loisirs www.franceloisirs.com	Mail order distributor of cultural products.	Consumers	3 492[2]	4 108[2]
Groupement d'achats Leclerc	Retail distribution purchasing group whose core business is the procurement and distribution of fresh produce.	Independent stores	182[2]	100[2]
Havas Www.havas.fr	Book distributor.	Bookstores	19 000	20 000
Éditions Lamy www.lamy.fr	Specialised legal publisher.	Consumers and professionals	NA	NA
La Redoute Www.nowhere.fr	General-purpose mail order house whose core business is textiles.	Consumers	9 500	13 000
Marcopoly Www.marcopoly.fr	Distributor of household appliances on the Internet. New business model.	Consumers	NA	6
OCP	Distributor of pharmaceuticals products.	Pharmacies	36 000	5 400

1. The case studies of 00h00, Cylibris and Casino were conducted from press sources and did not involve interviews.
2. 1997 data; all other data are for 1998.

ANNEX 2. SELECTED INDICATORS OF E-COMMERCE VIA THE INTERNET IN FRANCE

According to recent research, the number of electronic commerce business-to-consumer Web sites is growing fast but remains relatively small.

Table 7. Turnover on the Internet (online business-to-consumer sales)1 FRF millions

Source	1997	1998	1999	2000
Benchmark Group (1998)[2]	50	300	-	-
Benchmark Group (1999)[3]	50	400	800	2000

1. Estimated or projected.
2. Survey of the 55 most active sales sites in France.
3. Survey of the 75 most active sales sites in France.

Source: Benchmark Group, 1998; 1999.

According to the PL7 Conseil study (1998), commissioned and used by EDIFRANCE, AFCEE and the Lorentz Task Force (Lorentz, 1998), French firms do not use the Internet much for business-to-business transactions because they use other EDI resources and the Minitel. In France, EDI remains one of the most powerful driving forces behind the development of electronic commerce. The survey, carried out in 1997 on a sample of 1 500 firms described as "representative of 150 000 French firms with more than ten employees", also reports that the vast majority of exchanges (98%) are business-to-business[21] (see Box 9).

Box 9. Snapshot of the situation of electronic commerce in France

- 39% of French firms use electronic commerce.
- 98% of exchanges are business-to-business.
- The Minitel is used twice as much as the Internet for electronic commerce; 22% of firms said that they used the Minitel, 11% the Internet and 17% EDI.
- These mediums are used differently, depending on applications. The Internet and EDI are used twice as much as the Minitel to spread information (EDI is used to spread information concerning, for example, catalogues of products or technical sheets between partners). On the other hand, the Minitel is used five times as much as the Internet or EDI for purchases. For sales activity, EDI is used about one and a half times as much as the Internet or the Minitel. The Minitel is also the medium most used for electronic payment (54%) followed by EDI (42%) and the Internet (4%).
- 73% of firms using electronic exchange only do it for one commercial application (information, purchase, sale or payment).
- Large firms are the biggest users of electronic commerce: 82% of major accounts (over 500 employees) have developed electronic commerce solutions, compared with 54% of firms with 51 to 100 employees and 35% of firms with 10 to 20 employees.
- The Minitel is still the primary vector for widespread use of electronic commerce by SMEs with fewer than 50 employees.

1 Business-to-business or business-to-consumer, all electronic media included

Source: PL7 CONSEIL (1998).

A 1999 study by the Benchmark Group reported that in August 1998 only 405 of the top 1 500 French firms by turnover (27%) had set up a Web site. Of those firms with a Web site, 56% offered a first level of on-line customer service and 9% were able to sell on line (see Box 10).

Box 10. Large French enterprises and the Internet

What do the 1 500 largest French enterprises (by turnover) do on the Internet?

- 405 have opened one or more Web sites.
- 227 offer at least some client services on line.
- 36 have opened at least one Web site for on-line sales.

Source: Benchmark Group (1999).

A Locabail survey of European SMEs confirms this (Table 8). The methodologies used for these two studies are too different to be able to compare the data, but both show that the diffusion of the Internet is limited in both large firms and in SMEs. This trend goes hand in hand with computerisation rates and the implementation of networks in French companies (Box 11).

Table 8. Diffusion of the Internet in European SMEs

	France	Italy	Germany	England	Spain	Total
Number of SMEs[1]	256 044	190 168	394 179	307 128	356 204	1 503 723
SMEs connected to the Internet	40%	40%	68%	67%	41%	53%
SMEs with a Web-site	13%	14%	16%	41%	12%	19%

1. SME: 6 to 200 employees.
Source: UFB Locabail (1999). Survey based on a sample of 6 000 European firms.

Box 11. Extent and use of networks in France

- 63% of French firms had a computer network in 1997, compared with 32% in 1994.
- Almost 100% of SMEs have computers but only 33% of them use networks. This rate increases to 88% for large firms.
- 45% of firms surveyed transfer data between departments (purchasing, sales, accounts, etc.) and 33% between these departments and production departments.
- 17% exchange computerised data with their customers, 15% with public authorities, 14% with their subcontractors and suppliers.
- 28.2% use the Internet.
- 13% have set up a Web site.

Survey carried out by the Industrial Statistics Unit of the Ministry of Industry.

Source: SESSI (1999).

ANNEX 3. GLOSSARY[22]

AFCEE	*Association française pour le commerce et les echanges electroniques* [French Association for Electronic Commerce and Exchange]. The AFCEE is a non-profit association governed by the French Law of 1901 set up at the beginning of 1996 by the "Club de l'Arche", Edifrance, Mercatel and AFTEL Multimédia, which decided to pool their efforts to promote electronic commerce in France: www2.atelier.fr/AFCEE
ALLEGRO	*Automatisation des liaisons avec le langage d'echange GENCOD par réseau d'ordinateurs* [Automation of computer network links using the Gencod language]. The electronic message handling service was started by GENCOD using Bull hardware and the Transpac X400 network. It supports e-mail messages in the GENCOD and UN/EDIFACT languages. Allegro is used in the supermarket sector.
ATLAS 400	Electronic mail service offered by Transpac for computer data exchanges. The service is based upon the X 400 recommendations of ITU-T.
Business process reengineering	Method for reconfiguring information systems and business procedures.
EDI	Electronic Data Interchange. The electronic exchange of structured data between computers (between applications) using predetermined standard messages and a particular mode of communication.
EDIFACT	Electronic Data Interchange for Administration, Commerce and Transport. Pertains to the United Nations rules approved and published by the UN Economic Commission for Europe.
EDIFRANCE	The Edifrance association was set up in January 1990 to promote the use of EDI and to demonstrate the fundamental contribution it can make to business competitivity: www.edifrance.org
EDI light	See Web EFI.
Electronic commerce	For the purposes of this study, the definition of electronic commerce has been widened to encompass all on-line transactions: quotations, sale and purchase orders, etc. Payment is not necessarily included.
Interactive EDI	Interactive Electronic Data Interchange. Consists of a series of exchanges of paired messages (question/answer) between two computers, in real time (traditional EDI is effectively off-line).
Extranet	An extranet is an intranet opened up to a limited number of selected partners outside the business.
Interface	The medium where two sub-systems of a given computer system interact and exchange information. By extension, the device enabling two systems of different specifications to work together.
Internet	Worldwide network formed by linking up computer networks that use the same communications protocol (TCP/IP), which then operate as a single virtual and co-operative network.
Intranet	Network employing the technology of the Internet and the Web in an information system within a particular business. The intranet can be shielded behind a "firewall" (software protecting the network from outside intrusion) so that the circulation of the information remains strictly inside the enterprise.

Modem	Modulator-demodulator. Electronic system that converts digital computer data into analog form for transmission over a telephone line.
Multimedia	Generic term denoting all techniques, programmes and methods used to integrate data from a variety of sources (text, images, sound, etc.).
Open EDI	Exchange of computer data between a large number of independent organisations applying standard procedures and seeking to ensure the interoperability of computer systems and types of data, over time and between business sectors, permitting multiple simultaneous transactions with a common, explicit business objective.
Open system	A system that offers interoperability and standardisation at every level of the application (ISO 8402). In general terms it means monitoring an entity from production of its component parts to the end of its use; in EDI, from the separation of the physical flow and the flow of information pertaining to it.
TCP/IP	Transmission Control Protocol/Internet Protocol. Protocols corresponding to those of layers 3 (network) and 4 (transport) in the interconnection model of open systems (ISO).
Translator or Translation (programme/ package or module)	Software that converts data from one format into another, such as a common language format. The programme translates the data in an internal file (prepared by an internal application) into data in a common language (UN/EDIFACT, for example). Then it generates the standardised structure of the message by placing the translated data at the correct position in the structure. For transmission, it translates from the enterprise's internal format into the EDIFACT format. At reception, it translates in the opposite direction. This programme utilises tables of EDIFACT elements (messages, segments, data and lists of codes) and tables of correspondence between data from internal files and message data. Synonyms: converter, conversion programme or package.
Web-EFI (or EDI light)	(*Echange de formulaire informatisé*) Electronic form exchange. A new form of electronic exchange that combines the techniques of the Internet with EDI and allows small businesses to embark upon EDI at limited cost and using standardised data. The principle is to clearly display or print the EDI messages received. The user wishing to place an order sends an ordering message identical to the one he would send to a supplier with an EDI facility. The EFI receiving station converts the structured order file into a form that can be displayed on screen. The supplier can work on the order displayed and modify it to produce a new EDI message, which is then transmitted back to the source of the order.

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NOTES

1. Refers to the concept of "contestability" reviewed by Baumol *et al*. (1982).

2. This approach is also observed in the music and software sector.

3. On Thursday, 9 September 1999, the on-line bookshop BOL France launched a promotion aimed at advertising BOL Services and making net surfers more aware of electronic commerce. Between 5.30 p.m. and 8.30 p.m. on that day, it was possible to obtain books free of charge by logging on to the site. Some 10 000 orders were received in 2 hours. The investment necessary for this type of operation is of the order of several hundred thousand francs.

4. An unplanned phenomenon such as an author appearing on television.

5. www.alapage.com www.fnac.fr, www.bol.fr, www.furetdunord.fr

6. For example, see the site of Proxis, a Belgian specialist in selling books and CDs at "giveaway prices" which evades the Lang Act by selling books to French Web surfers at a price below the legal minimum. www.proxis.be

7. Tonnellier and Lemarchand (1997): Copyright acknowledged on the net: initial pursuit, initial decision and first analysis.

8. The Pinault Printemps La Redoute Group (1998 pretax turnover of FRF 108 billion for a workforce of 70 000) combines a number of well-known names like Printemps, Conforama, the La Redoute Group and Fnac and trade distribution names such as Pinault, Becob and Guilbert (the European leader with a worldwide presence in supply of office furniture and machines).

9. The aim of the European project is to define a new organisational model for advanced communications in the European textile and clothes industry, that would enable them to be integrated into existing information systems, particularly in the transport sector, and to explore new approaches to organisation and management that would enable the industry to become more competitive. The project budget is ECU 3.67 million and is partly funded by the European Commission. European co-ordination of the project is by ASTER aster@ervet.nettunuo.it. In France, the technical co-ordinator is the *Centre d'études techniques des industries de l'habillement*. The EDI-li Website was set up and is accommodated by www.nyconsultant.fr.

10. Amazon.com for example has opened a number of giant warehouses.

11. For example shampoos, soap, beauty products, babies' dummies and adhesive plasters.

12 Originally the term used was EDI-light. EDI-lite is now used in particular by those offering these systems, both terms refer to the same solutions. EDI-light is used in this report.

13. At present, this change is almost imperceptible: Internet use is still low (less than 5% of ordering and selling instructions in all our case studies), both in B-to-B and B-to-C applications. The reason is probably

that the Internet is in the start-up phase in France. However, the declared growth rates (verified or expected) are high at about +40% a month. All those interviewed predicted the disappearance of the Minitel in the relatively near future (three to five years).

14. The Lang Act fixes the prices of different types of book (to within 5%). It was passed to protect small bookshops against competition from the major chains.

15. According to a survey by Andersen Consulting, "Europe takes off", conducted in May 1999 of 350 European business managers, 40% of them plan to enter this field within the next five years and 40% consider that the Internet has already changed the way they do business.

16. See the results of *PL7 Conseil* (1998) in Annex 2.

17. See Strategic Group Advertising on the Internet 1999 at http//:www.strategisgroup.com/.

18. As can be seen from the accounts of Amazon.com in the United States or those of the E-Laser and Télémarket subsidiaries of Galeries Lafayettes in France.

19. In mid-2000, ten OECD countries had actively joined this project: the Netherlands, France, Canada, Italy, Korea, Mexico, Norway, Spain, Sweden and the United Kingdom. Others had expressed great interest in this work and the possibility that some would later participate in the project.

20. See work for the OECD conference "Enhancing the competitiveness of SMEs in the Global Economy: Strategies and Policies" document DSTI/IND/PME(2000)1/FINAL, held 13-15 June 2000 in Bologna, Italy.

21. The Lorentz report (1998) reduces this figure to 80%, the figure now quoted in all official studies concerning France.

22. Most definitions are drawn from the *Glossaire EDI et Commerce électronique*, published on the Edifrance Web site www.edifrance.org.