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**The hidden face of electronic commerce
between enterprises**

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THE HIDDEN FACE OF ELECTRONIC COMMERCE BETWEEN ENTERPRISES

LA FACE CACHÉE DU COMMERCE ÉLECTRONIQUE INTER-ENTREPRISES

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ABSTRACT : Does the development of new means of circulating and processing information (notably the internet) ensure an immediate and easy access to information by every economic agent? Strategic information, that which is essential to define and implement the technical and financial strategies of organisations, is in the centre of the global competition between enterprises and becomes a real economic good. The industry of information expands strongly, notably over the internet. Electronic transactions between enterprises are characterised by the buying and selling of strategic information. But the access capacity to information depends on the quantity of human and financial resources which permits to large enterprises to acquire, process and protect information. Electronic commerce is in the hands of large size's enterprises

RÉSUMÉ : Le développement de nouveaux moyens techniques de diffusion et de traitement de l'information (notamment Internet) assure-t-il un accès immédiat et facile à l'information pour tous les acteurs économiques ? L'information stratégique, celle qui est essentielle à la définition et à la mise en œuvre des stratégies techno-financières des entreprises, est au cœur de la concurrence mondiale et devient un bien économique à part entière. L'industrie de l'information se développe fortement, notamment via Internet. Les transactions électroniques interentreprises sont caractérisés par l'achat et la vente d'informations stratégiques. Mais la capacité d'accès à l'information dépend de la quantité des ressources humaines et financières qui permet aux plus grandes entreprises d'acquérir, de traiter et de protéger l'information. Le commerce électronique est entre les mains des entreprises de grande taille.

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INTRODUCTION

The new economy of information, knowledge and networks is, for many economists and policy makers, the new phase of capitalism's growth and prosperity. Immediate and free information for everyone would erase differences, ensure co-operation and would become an inexhaustible source of creativity and innovation. But, behind this image of the new economy, reality is very different. Business intelligence, i.e. the legal activities of "seeking, processing and dissemination of the information useful to economic agents"¹ is today becoming a real field of economic activities in which innovative start-ups and large firms looking for new markets are investing

As yet information has been collected by enterprises and the administration in order to satisfy their own needs (stronger efficiency, national defence), but it is now becoming a real economic good. According to IBM's estimates, the average growth of the business intelligence market is of 50% per year and will rise to 113 billion dollars in 2002. In France, the market of professional electronic information amounted to 5.4 billion French Francs in 1998, according to the French Group of the Information Industry (GFII), and is the second European market, before Germany and after Great-Britain.

The aim of this paper is to study the causes and consequences of the development of the information market and industry, notably through the Internet and electronic commerce. In particular, does the development of those new means of circulating and processing information ensure immediate and easy access to information by every economic agent? In the first part of this paper, we will study the characteristics and the economic functions of information in the current context of global competition. The second part reviews the industry (its actors) and the market of electronic information. Then, the third part focuses on the access costs to the Internet and to the information circulating over the Internet. In conclusion, it appears that the new electronic means do not modify the unequal distribution of information. Strategic information, that which is essential to define and implement the technical and financial strategies of organizations is captured by those who possess abundant human, financial, scientific and technical resources.

INFORMATION, A PECULIAR GOOD

Calling information an economic good does not seem to be in agreement with its characteristics. An economic good is defined as a useful object, available in a definite quantity, exchangeable at a fixed

¹Useful information serves to "elaborate and implement in a coherent way, the strategy and the tactics necessary to reach the targets defined by the enterprise in order to improve its rank in its competitive context", Martre (1994).

price and which can only be consumed by a consumer at one and the same time. Information does not meet this definition. Information is not divisible (what is a half of information?), it is hardly measurable (in which unit?), it is not perishable and can be consumed by more than one person at the same time (case of a radio broadcast, of a movie,...). Furthermore, creating new information is expensive, but its duplicating is not: it is for example useless to re-formulate the idea of the wheel in order to produce a new model of bicycle...² Facing those difficulties, it took the economic theory time to study information as an economic good. More naturally, information has been studied as a means of regulating markets: the pure and perfect competition of the neo-classical economists³ is linked to transparency. This means that consumers and producers know the price and the quantity of the goods available on the market. Then, the recognition of the imperfect distribution of information threw light on the games and the strategies defined by economic agents⁴.

But information has another economic function: it is used in the production and the renewal of goods (Laperche, 1998). Information is the raw material of innovation, defined by economist J. A. Schumpeter (1912) as a new combination of production means with, as a consequence, increased profits for entrepreneurs. This combination of production means can take different forms: new product, new method of production, new organisation of production, new source of raw material, new market. In the context of globalisation, the implementation of the innovative process, the nerve of competition, requires the acquisition and the use, in the production and in the definition of the corporate strategy, of substantial volumes of strategic information (Laperche, 2000). Strategic information consists of the whole information which, once integrated in the organisation and implementation process of production, facilitates the creation and the quick renewal of goods and services, as well as the management of human, scientific, technical and financial resources possessed by firms.

Strategic information can be divided into three categories:

- Enterprises utilize *scientific and technical information*, stemming from the work of scientists, engineers and technicians, as a means of producing new goods and services. Their capacity to quickly renew their offer, i.e. to implement an innovative process, depends on their ability to acquire, protect and integrate the scientific and technical information which circulates on the market into their technological patrimony.

² On the characteristics of information see for example Madec (1980) and the work of the evolutionist economists (who are applying part of Schumpeter's methodology to the analysis of research and development, e.g. David (1998), Arrow (2000))...

³ The Neoclassical approach was developed at the end of the 19th century. The main first authors (Walras, Jevons, Merger) developed a micro-economic approach, based on pure and perfect competition, which comprises five major hypotheses : 1) atomicity, which means that there are a lot of sellers and buyers on the market and none of them is able to affect prices 2) free entry and free exit from the market, 3) product homogeneity 4) homogeneity and substitutability of production factors 5) transparency, i.e. free circulation of perfect information on prices and products.

⁴ In the context of the crisis of the thirties, some economists (notably Joan Robinson, *The economics of imperfect competition*, 1933 and E. Chamberlain, *The theory of Monopolistic Competition*, 1933) have challenged the hypothesis of pure and perfect competition. Then, new micro-economics theories were developed, this time in the context of imperfect competition. This is for example the case of the theory of Games, first developed by J. Neuman and O. Morgenstern (*Theory of Games and Economic Behaviour*), which studies the strategies implemented by actors in a context of imperfect information.

- *Economic and business information* is essential to the firms' positioning on new market segments or to reinforce the international growth of their production capacity. This type of information permits to understand the characteristics of the targeted markets: size, characteristics of competition, consumer tastes, technical or organisational standards, economic or political risk, etc.

- Finally, *financial information* (evolution of the quotations on the stock-exchange, stock-exchange statement in general) is more and more important for organizations. In all industrial sectors, companies implement global technical and financial strategies (See Uzunidis, 1996). This expression describes the overlapping of the production, commercial, and financial components of corporate strategies. In order to be able to diversify their offer, organizations focus on their technological competencies which are the basis of their efficiency, and reinforce them through mergers, take-overs and strategic alliances. At the same time, firms outsource the segments downstream the production process of goods and services (for example the final assembling and commercialisation, diverse management services). Thus, the firm's main activity consists in managing a portfolio containing more or less steady financial investments (from buy-out to joint-venture and franchise) and spread over different countries.

The strategies implemented by firms and their information needs contribute to explain the transformation of information into an economic good, sold as any other good, even if its characteristics are peculiar. More and more enterprises (new ones and old ones) specialise in seeking, processing and managing information for the account of large firms. The latter ones then integrate the information into their informational patrimony in order to reinforce their efficiency. But another explanation lies in the development of new electronic means (notably the Internet) of circulating information. Those two elements explain if not the birth, surely the unprecedented development of the information industry and market.

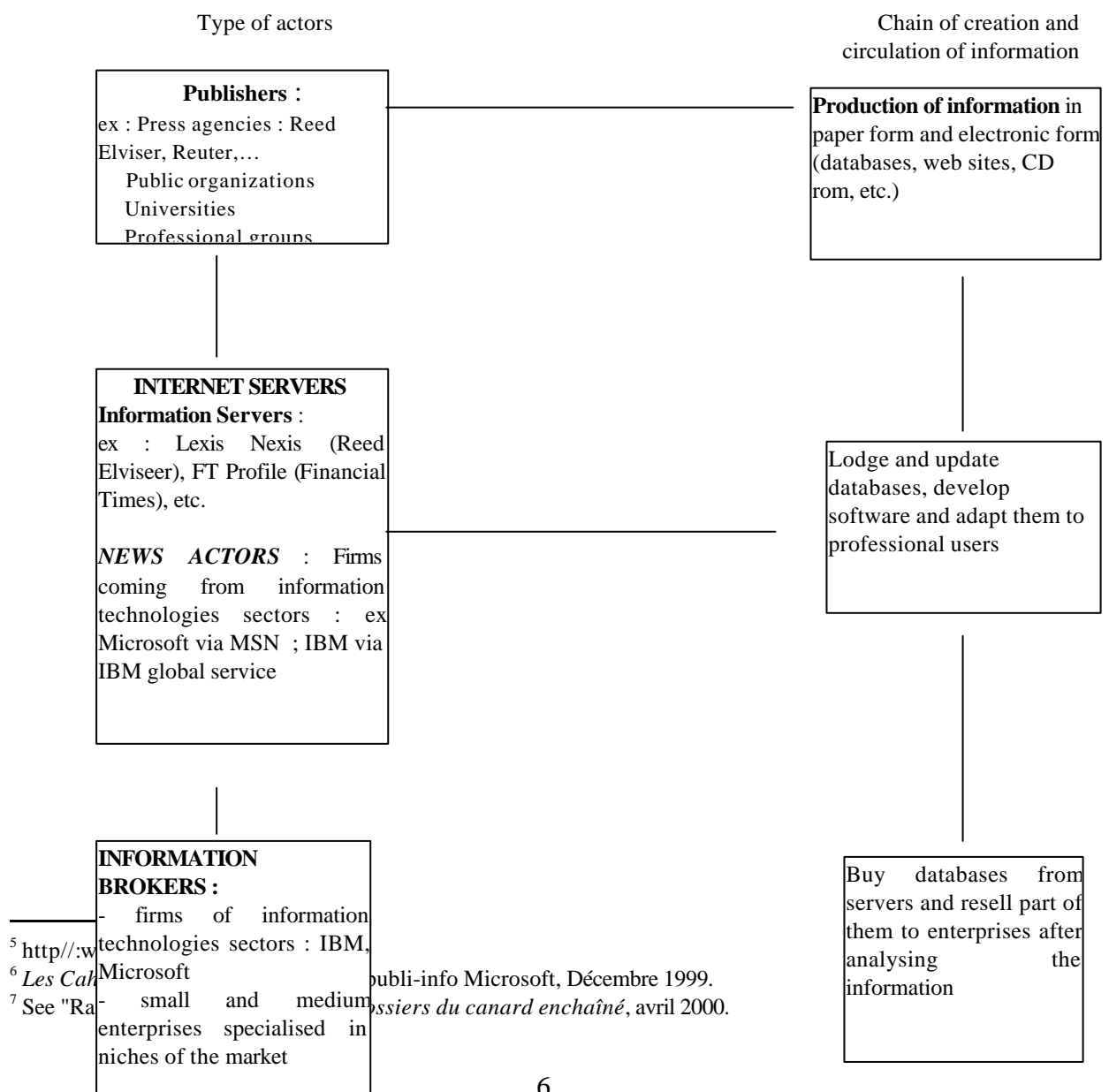
THE INDUSTRY OF INFORMATION AND ITS ELECTRONIC COMMERCE

The industry of information is not a new one. During the 19th century, press agencies such as Havas, Wolff, Reuter, the economic and financial press (*Financial Times*, *Wall Street Journal*) and the first enterprises specialising in business intelligence emerged (Mattelard, 1998). Today, this industry is booming, but in an electronic form. Business intelligence is more and more linked to the Internet, and soon to the mobile phone which will represent more than 60% of the Internet access in 2003. Information is hidden and can be found thanks to electronic spies, in other words the Internet service providers (for example Yahoo.com, Msn.com...). Then, it is processed by powerful software and computers (for example data storage software, data extraction software...)

In order to meet the growing needs, new agents are building a real chain of electronic information (scheme 1): publishers produce information in paper form (newspapers, magazines) or in electronic form (databases, web sites, on line data services). By January 2000, 1 billion documents were available on line, 2.4% in French and 86.6% in English. Internet servers lodge databases, synthesise them and adapt them to the needs of professional consumers. Brokers buy data, analyse them and resell them to enterprises. Large groups specialised in information technologies tap this new business, thus becoming service providers and information brokers. IBM for example is less interested in producing computers and is more and more specialised in information services which represent 30%

of its turnover. Its Business Intelligence department operates the information systems of Les Galeries Lafayette, Mammouth, Miele...⁵ Microsoft has created a large network of co-operation with enterprises specialised in electronic commerce and develops its electronic commerce strategy following three ways: by improving the Windows operating system, Microsoft taps the promising market of personal data confidentiality and payment security. Furthermore, Microsoft proposes to enterprises all the software necessary to start an electronic commerce activity. Finally, its MSN server helps consumers and producers to get in touch⁶. Innovative entrepreneurs are on the increase: some of them offer global services of business intelligence, associating press reviews, information retrieval, documentary engineering and training. Others are specialised in market niches like knowledge management or analyse the rumours circulating on web sites. The enterprises specialised in press reviews have a tendency to disorganise the chain of circulation of electronic information. These (such as for example Central Cast, News-invest, Mediapps,...) propose abstracts of articles already published on the servers of information producers (as *Le Monde*, *La Tribune*, ...) and resell them to enterprises (from industries to other servers or Internet service providers as for example Yahoo!). The problem is that those enterprises do not always pay the information producers...⁷

Scheme 1: The industry of electronic information



Electronic commerce has expanded exponentially over the past five years. Defined in a loose sense as "all the activities of exchange over the Internet generating value for the enterprise, its suppliers and its clients" (OECD - Lorentz, 1999), it is difficult to measure precisely how widespread e-commerce is. The indicators often cited (because they can be compared internationally) are the number of secured servers, the number of Internet hosts⁸ and the number of web users (Coppel, 2000). All of these indicators have expanded at a brisk pace. In March 2000, there were 66810 secure servers in all OECD countries, up 97% compared with a year earlier. The number of Internet hosts has increased at an exponential rate: following Network Wizzard (**Erreur! Signet non défini.**), there were 12.9 million Internet hosts in July 1996 and 56.2 million in 1999. It can be estimated that they could reach 100 million by the end of 2000. According to the Computer Industry Almanac, the number of web users reached 147 million in 1998 and is estimated to reach 300 million at the end of 2000 (Internet society, **Erreur! Signet non défini.**

Electronic commerce transactions are also very difficult to measure. The estimates published by consulting groups vary widely, due to diverse definitions and scope (table 1). But they all reveal extremely rapid growth -doubling the value of transactions every 12-18 months since the middle of the 1990s.

Table 1: Consultant estimates of World Wide e-commerce

US\$ billion	1999	2003	Average annual growth
E-marketer	98.4	1244	89%
IDC	111.4	1317	85%
Activmedia	95	1324	93%
Forrester low (a)	70	1800	125%
Forrester high (a)	170	3200	108%
Boston Consulting Group	1000	4600	46%

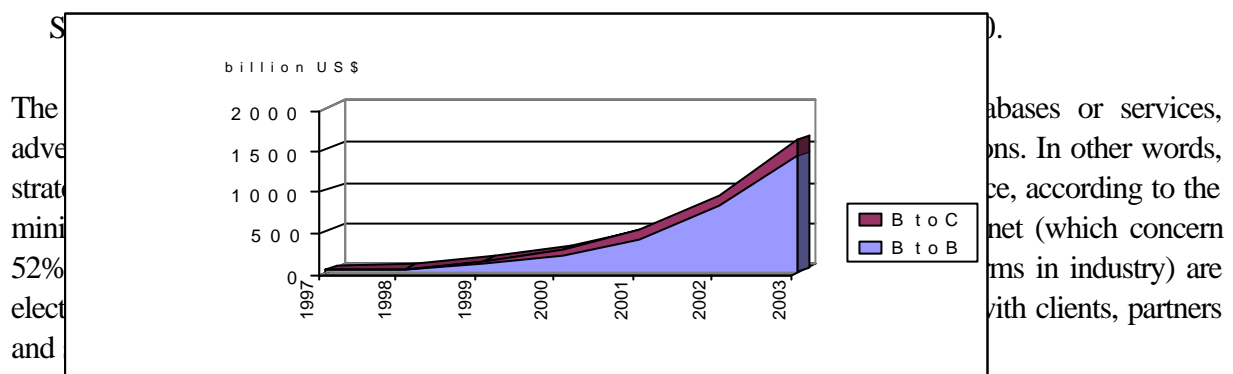
(a) includes internet-based EDI

Source: Coppel (2000).

⁸ The definitions we take are those of Coppel (2000, p.5). Internet hosts are defined as " any computer system with an internet protocol address connected to the network". Secure servers "allow users to encrypt information on, for instance, credit card data, which facilitates e-commerce. A count of secure servers, therefore, gives a reasonable measure of the distribution of e-commerce activities across countries".

Electronic commerce transactions can be here divided in two large categories: trade between business and consumers (BtoC) or between businesses (BtoB)⁹. But, the largest share of electronic commerce takes place between businesses, which accounts for 70% to 80% of all electronic sales. Furthermore, nearly 30% of the relations between the subsidiaries of a global enterprise, i.e. 70% of world-wide trade in 2000 are realized over the Internet¹⁰. Trade between business and consumer, despite its extremely rapid growth accounted for a very low percentage of retail sales at the end of the 1990s: 0.48% in the United States, 0.20% in Europe, with 0.30% in Germany, 0.37% in Great Britain and only 0.14% in France (Coppel, 2000). Thus, enterprises are the main actors of electronic commerce (as suppliers and consumers). And the projected values show the future importance of transactions between enterprises (Table 2).

Table 2: Recent and projected values of B2B and B2C electronic commerce



How could we explain that electronic commerce is more utilised by enterprises? Three reasons can be put forward. First, as Coppel mentions it, part of the progression in BtoB sales is linked to the rapid migration of supply chain management from relatively expensive closed EDI (Electronic Data Interchange) networks towards the Internet. Consumers are less used to utilising electronic communication links and the profile of the Internet user shows (in OECD countries) that a high level of education, high income and youth are key elements for the use of the Internet. Secondly, the need of reactivity, in the context of global competition can explain the important use of the Internet by enterprises. For consumers, this need is less important, even if it is becoming a real way of life! Finally, the costs of the equipment, of the access to the Internet, even if they are going down (see part three), and the lack of security still curb, in a lot of countries, the use of the Internet by consumers.

Governments have had an important role in the development of the Internet and of electronic commerce. Computers are machines born in the context of World War II. Before being an information superhighway, the Internet was originally an information network linking the organizations working for the American Ministry of Defence. Today, the development of an information industry and market is again linked to public policies. The political watch systems are placed at the disposal of enterprises: it is for example the case of *Echelon*, a world-wide network using communication

⁹ Other forms of electronic commerce exist in reality or potentially : for example transactions between consumers (CtoC), between consumers and business (CtoB), between business and government (BtoG), between government and business or consumers (GtoB), (GtoC),...

¹⁰ See "B to B or not to be", *Les dossiers du canard enchaîné*, avril 2000.

satellites. Built during the cold war under the aegis of the United States, it today intercepts the business information useful to American firms (Fernandez, 1999).

Furthermore, not only governments financed an important part of the infrastructure useful to develop the commercial use of the Internet, but they also urge firms to implement business intelligence strategies. Their main action means are budget, law and training. In France, for example, if large groups, linked to the Defence sector, lead a dynamic strategy of business intelligence, small and medium-sized enterprises do not. The French government supports those enterprises with budget and training. In every country, governments use the law in order to help firms to obtain and protect strategic information. In the United States, the relations between knowledge and power have been understood by large groups since the early 1950s, when technological watch departments were built. Today, the law of repression of industrial espionage, which came into effect in 1996, has an extra-territorial operation field. It can be imposed in and out of the United States, and always when the economic interests of the United States are threatened. In France as well, the law has been adjusted to the growing role of strategic information for firms' efficiency, and the main elements of the national economic and scientific potential have been integrated in the provisions of "the protection of the fundamental interests of the nation". (Warusfel, 1996).

The development of the industry of information and its electronic commerce facilitates in theory the circulation of information, and for many people contributes to build a "global village" in which everyone may easily access to information. But this hypothesis can be challenged by studying the access capacity to information.

WHAT ACCESS CAPACITY TO INFORMATION?

The access capacity to the information circulating over the Internet can be divided into three components studied below:

- a)- the distribution of the infrastructure necessary to access to the Internet and the distribution of Internet servers, web sites and users
- b)- the access costs to the Internet
- c)- the access costs to information itself

a) The distribution of the infrastructure, of Internet servers, web sites and users

The hypothesis of the building of a global village is first questioned when we study the world-wide distribution of computers, Internet servers, web sites and users. The market of information technologies (big information systems, individual computers, peripherals, software, services) is very concentrated in the countries of the Triad (United States, Europe, Japan): in 1997, OECD countries accounted for 90% of the demand, and G7 countries for 88%, and at the end of the 1990s, the United States and Japan are still the first world-wide producer of data processing material, accounting for more than 80% of the world-wide production (see Coppin, 1999). At the end of 1998, nearly 3 million web sites were counted in the World but 96 % were concentrated in OECD countries. And the distribution is the same for the users. Their number, supposed to reach, as we mentioned above, 300 million at the end of 2000, only accounts for 5% of the world-wide population.

b) The access costs to the Internet

Furthermore, among OECD countries, access costs to the Internet are very different. Following J. Coppel (2000) access costs to the Internet comprise 3 components: fixed and usage telecommunication charges and the fees of an Internet service provider. The total cost on average in OECD countries has fallen from \$92 for 40 hours at peak rates in 1999 to \$76 by March 2000. But, among OECD countries, price disparity has increased. Usage costs have dropped, in part linked to the liberalisation of fixed telecommunications networks. But, in some countries, access to the Internet has lagged due to high local communication charges, which is significant for engaging in e-commerce for consumers and small businesses alike. So, usage costs in the United States, Canada, Mexico, Finland and Australia are some three times lower than in Belgium, the Czech Republic, Hungary and Poland, the most expensive countries, for 40 hours at peak access. Access costs to the Internet in the United Kingdom and in France are lower than the OECD average, reaching respectively \$55 and \$58.

This explains the dichotomy existing in the business use of the Internet in OECD countries, with usage substantially higher among large firms than small firms. In Japan for example, Internet penetration among firms with more than 300 employees has reached 80% but is only 20% in firms with less than 6 employees (Coppel, 2000). In France, Internet penetration among industrial firms with more than 500 employees reaches more than 95% but is under 60% in firms with less than 250 employees (Sessi, 1997).

Even if the liberalisation of telecommunication, including the liberalisation of the local loop contributes to lower the access costs to the Internet, it doesn't mean that information will be easily accessible. As a matter of fact, much more important than the access to the Internet is the access to the information circulating on the Internet.

c) The access costs to information

As we mentioned above, information is becoming a real economic good, bought and sold as any other good, partly due to the growing need of strategic information for firms as well as to their organisation (outsourcing) and to the development of new communication means (notably the Internet). Business intelligence is today an economic weapon: it facilitates the capture of new markets, lowers production costs and communication expenses. But the positive experiments are often associated to the names of large firms¹¹, because the marketing of information is linked to the increase of its price. In order to build a personal database used to follow the flow of goods and to classify the customers, the necessary investment can be from 305 000 Euro up to more than 3 million Euro. The *Centre Européen de Documentation*, which collects free information provided by enterprises, invoices this activity for nearly 2000 Euro up to more than 4500 Euro per year, depending on the geographical area. In France, the minimum price for an enquiry reaches 4500 Euro and often exceeds 38 000 Euro.

¹¹ For example, France Telecom operates files in order to create targeted subscriptions. Dell and Amazon.com store information on their customers and follow them thanks to electronic spies (cookies) in order to make custom-made offers. This one to one marketing strategy is also lead by the Doubleclick enterprise (specialised in advertising) which follows web users in order to know their tastes and to stick target advertisements.

The "global village" promised by the Internet is in reality a toll-motorway: according to experts, 80% of the information provided by Internet service providers is free of charge, but these sources create a need for the 20% of the information which remain, hidden in professional databases, reliable but available with charge for admission, such as for example subscriptions. Most public servers (administration, universities) and private servers (press agencies, media) are now selling their information and prices increase with the accuracy of the information sought. Public databases are more and more often managed by private firms which acquire the operating rights and sell the information to consumers, even to public administration which produce the data!¹²

Thus, large groups possessing important human, financial, scientific and technical resources can easily access to strategic information, which is still hard for small and medium-sized enterprises. Corporate strategies also ensure better protection of information. The learning processes (learning by doing, by using, by learning)¹³ implemented in large groups give single characteristics to information and make its transferability difficult. As we studied in the first part of this paper, information is often considered as a free and public good, due to its particular characteristics. But the capacity of large firms to acquire information (also thanks to the financing of innovative start-ups -corporate venture-, to the signature of strategic alliances with other large enterprises in the fields of research and development, production and marketing of goods), to give single characteristics to the information they acquire (thanks to learning processes) and to protect it (thanks to the definition of technical and trade standards, to the more frequent use of property rights -patents, trademarks, models- to the greater perfection and safety of their informational systems), large groups convert this "free good" into one which can be appropriated and is more and more expensive. The information systems of large enterprises (Intranet) organised in networks is a two-tier system : while the information useful to the implementation of the corporate strategy is "open" and accessible to every employee, the most valuable information (which is at the basis of the definition of productive and trade strategy) circulates in closed circuit (firewalls). Thus, this information is better protected from cyber crime (information stealing) (see Uzunidis, Boutillier, 1997). Information seems to belong to the agents who process it. These are building "informational barriers to entry" for small enterprises looking for establishing themselves on their markets.

CONCLUSION

As a conclusion, we could say that the growing, but very unequal use of new electronic means of seeking, processing and circulating information can be considered as the main support of large groups' appropriation strategies of strategic information. The industry and the market of information are growing and converting information into a real economic good. This has been explained here by the growing need of strategic information by firms, by their new organisational methods (networks and outsourcing) and by the development of new technical means of circulating information. These contribute to individualise the access to information and allow the commercialisation of all types of information. But, the main part of the information circulating over the Internet plays the role of an

¹² For example, the US Securities and Exchange Commission had to buy its own data from a private enterprise which operated the database, and it is the same for example in France with the ORT enterprise which operates the databases of the French trade register, see Quéau (2000).

¹³ Those concepts have been developed by industrial economists. For an explanation of all those processes, see Y. Morvan, *Fondements d'économie industrielle*, Economica, Paris, 1992.

advertising bait in order to reach the strategic information hidden in databases available with charge for admission.

As a consequence, firms which have important resources can access to the strategic information, process it and protect it. Today, information circulation over the Internet belongs to those who process it and then sell it as any other good. The technical means of circulating information can't help to build a global village of free information for everyone because those means are appropriated by large firms which aim at expanding their influence on the "electronic Age" they are building.

Finally, in order that electronic commerce may become a reality (in terms of profits, of productivity gains and finally of economic utility), there are a lot of obstacles to get round, notably concerning the security of electronic transactions, the problems of taxation and of goods forwarding...

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