

**The Impact of Internet on the Operations of Medium
and Large Industrial Enterprises**

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Introduction

The use of the Internet has been expanding increasingly rapidly with the globalization of trade in products and services, intensifying competition and fast technological change. The United States of America, Canada and the European Union countries were the first to make use of it but, since 1996, there has been a considerable growth of networks in the emerging countries of Asia, Latin America and Oceania.

The new information and communication technologies provide business firms in Senegal with opportunities for growth and integration into international markets and they should see the Internet as a lever for developing internal and external trade. In March 2000 there was a successful political regime change in Senegal and in the national institutional environment and these, together with the acceleration of sub-regional (WAEMU) and regional (ECOWAS) economic integration, the globalization of economic options and fast technological changes, are forcing these industrial units to draw up a coherent strategy for inserting themselves into world trade. Their operational surroundings, that of the “economic world”, indicate that economies of scale are achieved less and less in time and more and more in space.

These technologies increase flexibility in the conception of production equipment, the manufacturing process and decision-making within firms, while the requirements of the world market are multiplying, radicalizing and generalizing in terms of rapidity, flexibility, relaunching and quality. Thus the survival and growth of any business depends increasingly on its effectiveness. This has come to mean total quality, ISO certification, just-in-time production and zero default. Senegalese industrial enterprise is still in its early stages and it is learning techniques and methods of organizing production, marketing of products and information exchange. However, it experiences a number of difficulties, viz:

- a limited local market;
- strong competition from products originating from developed and the so-called emerging countries (dumping, under-invoicing, smuggling);
- limited availability of local inputs (raw materials for industry);
- low productivity of the local labour force;
- insufficient financial products/facilities for the different stages of enterprise development (creation, growth, restructuring, etc.);
- poor state of the basic infrastructures, taking into account the interdependence of infrastructure and economic growth;
- weak capacity for innovation and development research;
- relative inefficacy of administrative support to the private sector, etc.

Since 1999 the State and the private sector have been declaring their intention to turn Senegal into an emerging country over during the next twenty years. However, this will depend on having a dynamic manufacturing sector and making Internet into a tool for developing business enterprises.

The influence that each economy exercises on the rest of the world increasingly depends on the extent of its opening up and the geographical orientation of its trade flows. Through their ability to link up with a large number of enterprises, both in time and space, the new information and communication technologies have transformed business relationships and improved systems for data collection, treatment and dissemination. They offer less developed countries (and in particular Senegal) and their business enterprises new opportunities of growth and integration into the international markets. Hence, for Senegal, the issue is now how to select, through use of the Internet, all technological and/or information changes relating to commerce, finance and management that would help improve the competitiveness of its industrial enterprises. This paper attempts to respond to this question, using the following approaches:

- evaluating the extent to which Internet is used in the medium and large industrial enterprises of Senegal;
- identifying the profile of the heads of business firms that are using this technological tool;
- studying the use of Internet in these firms ;
- analysing the possibility of correlating the degree of Internet utilization with the opening of business firms to the world market.

The industrial enterprise, as a leading economic agent capable of using the Internet, can contribute to economic and social development. The new geographical pattern of trade in Senegal, as a result of the sub-regional economic integration through the West African Economic and Monetary Union (WAEMU), indicates that similar studies should be carried out in the other member countries of the Union in order to make heads of enterprises more aware of the opportunities provided to African industry by Internet.

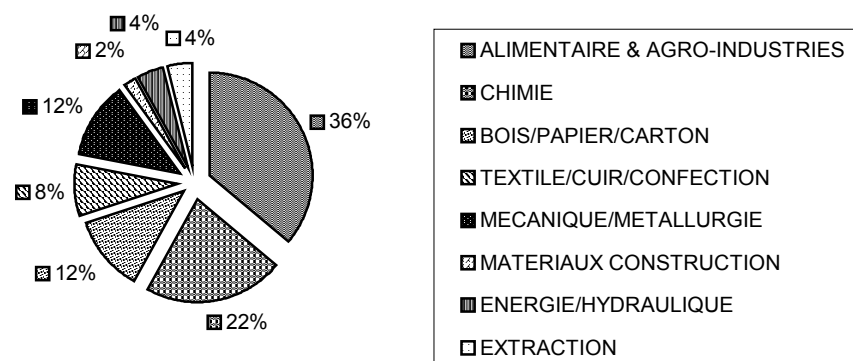
The methodology used in this study is carried out in five phases:

- determining a sample of fifty (50) medium and large firms in the industrial sector;
- drawing up a questionnaire;
- carrying out the survey;
- treating the resulting data, using Filemaker Pro;
- analysing the data.

In order to determine the sample it was necessary to divide, by sub-sectors of activity, the 319 firms included in the last census of industrial enterprises,¹ which was carried out in 1995.

¹ UNDP/Government of Senegal, *L'industrie sénégalaise de 1992-1995*, Dakar, May 1997

Figure 1: Division of industrial enterprises by sector of activities



On this basis, 50 medium and large industrial firms likely to use Internet were identified. They were divided as follows:

- 18 in the food and agro-industrial sector, representing 36 per cent of the sample, divided according to the following table:

Table 1: Firms in the food and agro-industrial sub-sector

Main activity	Number of firms
Fish	3
Milk and derived products	3
Fatty substances	1
Grains and flour	3
Confectionery and biscuits	3
Drinks	1
Tobacco	1
Tomatoes	1
Cooked meats	1
Poultry	1

- 11 industries in the chemical sub-sector, representing 21 per cent of the sample and active in the fields indicated in table 2:

Table 2: Firms in the chemical industries

Main activity	Number of firms
Soap and toothpaste	1
Oxygen	1
Paints	1
Pharmaceutical products	3
Batteries	1
PVC (vinyl) products	1
Plastic products	1
Oil products	1

Gum arabic	1
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- 6 production units in the wood/paper/cardboard sub-sector, representing 12 per cent of the sample and divided thus:

Table 3: Wood and paper firms

Main activity	Number of firms
Wooden furniture	1
Paper/cardboard articles and products	1
Printed paper articles and products	2
Paper/cardboard packaging	1
Wooden matches	1

- 6 enterprises in the metallurgical/mechanical sub-sector, representing 11 per cent of the sample and divided as in the following table:

Table 4: Metallurgical and mechanical firms

Main activity	Number of firms
Agricultural materials	1
Iron and steel pipes and sections	1
Iron packaging for food products	1
Plastic/cast iron/iron/steel packaging	1
Household goods in enamelled iron and steel	1
Maintenance and rectification	1

- 4 textile/leather/clothing production units, representing 8 per cent of the sample and divided as indicated in the following table:

Table 5: Textile and ready-made clothing firms

Main activity	Number of firms
Spinning	1
Spinning and weaving	1
Ready-made clothing	1
Spinning, weaving, dyeing, printing, ready-made clothing	1

- 2 enterprises in the extraction sub-sector, representing 4 per cent of the sample: Phosphates (1) and Attapulgate (1).
- There is 1 production unit for construction materials (representing 2 per cent of the sample), which is a cement factory. There is also 1 industrial plant for the production and distribution of electricity (1 per cent of the sample).

The questionnaire prepared for the heads of the selected enterprises served as the basis for a field study. Filemaker Pro² was used to treat the data. To analyse the extent to

² The authors of this paper work in the industrial field : Philippe Barry is the secretary-general of the Syndicat professionnel des Industries et des Mines du Sénégal (SPIDS), which groups 92 medium and

which Internet is utilized in the different firms, different cross-sorting was carried out, based on the following variables (see annexe for the break-down of the sample):

- extent of use of information technology;
- origin of capital;
- cultural background of the head of the industrial enterprise (age, level of training and original nationality);
- sector of activities ;
- direction of trade flows.

large industrial firms ; and Hamidou Diop is the secretary-general of the Conseil national du patronat du Sénégal, representing 18 employers' associations and 620 enterprises.

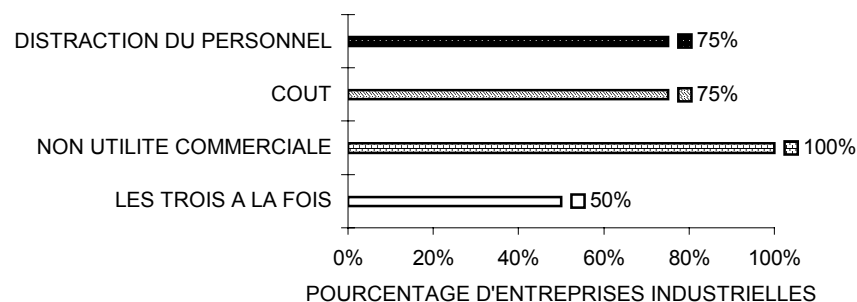
Connection to and Use of Internet in Medium and Large Industrial Firms

Connection to Internet

Connecting to Internet has become a daily practice in the medium and large industrial enterprises of Senegal, 92 per cent being connected to the world network. Since 1996 there has been a constant increase in the use of Internet, both in the number of firms having access to the Web and in the quantity of daily connections. The percentage of firms having access to the world network has continually increased: 13 per cent in 1996, 22 per cent in 1997, 24 per cent in 1997 and 34 per cent in 1999. This development shows the importance attributed to the Internet by the heads of these enterprises. The average frequency of connection is always on the increase: 56 per cent of the firms connect several times a day on average ; 22 per cent, twice a day ; and 22 per cent, once a day.

Most of the industrial firms that are not connected to the world network (8 per cent) are headed by people of Senegalese origin. To justify their non-connection, they explain that the main reason is commercial. As far as they are concerned, Internet cannot act as a lever for improving their share of the market. Other reasons given are mainly the risk of employees amusing themselves on the Web and the hourly cost of utilizing it, considered to be still high.

Figure II: Reasons for non-connection to Internet



Lack of connection to the world network can in fact be explained by the reluctance of the heads of enterprise to use information technology. The “elderly” age and the “low” level of training account for this reticence. In 83 per cent of the industrial enterprises access to Internet is limited to the head of the enterprise and it is only in 15 per cent of them that his close colleagues are authorized to use it.

Two reasons are given by heads of enterprise for restricting access to the world network. The first is because of the cost of Internet, which is considered a not negligible financial burden by 45 per cent of the heads of enterprise of Senegalese

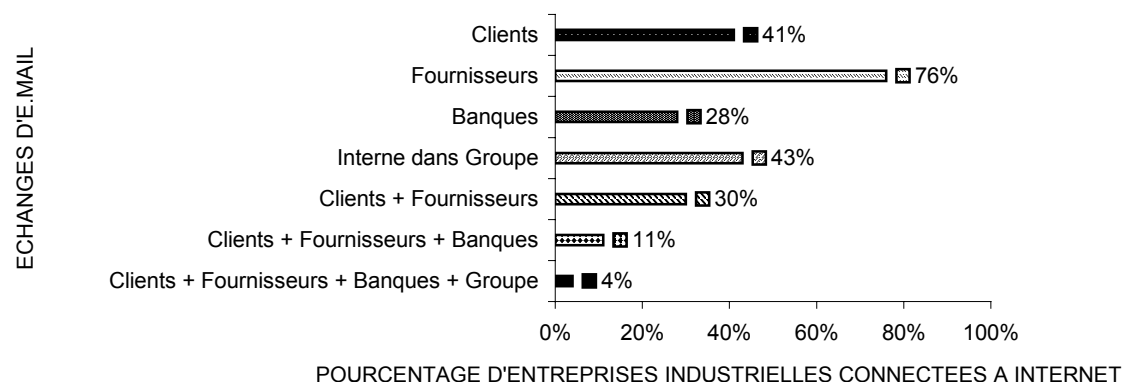
origin, 22 per cent of Lebanese origin and 9 per cent of French origin. This view is held by heads who have business profiles as self-taught technicians (33 per cent) and as senior managers (16 per cent).

The second reason expressed by these economic actors is that utilization of the Internet is premature, given the nature of industrial activity and its external contacts. This is expressed above all by 44 per cent of the heads of firms who are of Lebanese origin, followed by 36 per cent of Senegalese origin and 9 per cent of French origin. When the level of training is investigated it was found that this viewpoint is held by 44 per cent of those who are self-taught technicians and 19 per cent of those who have a senior manager profile.

Use of the Internet

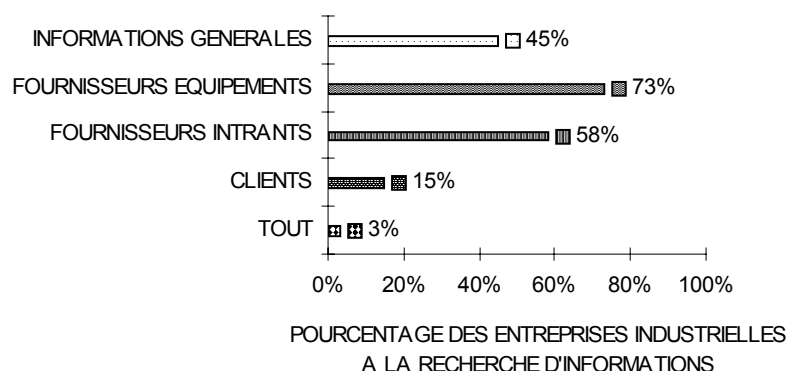
Electronic mailing constitutes the main use of the Internet. While 92 per cent of industrial firms are connected to the world network, it is nevertheless clear that there is an under-utilization of this technology, particularly of its various functions. This is not the case only in 11 per cent of the production units.

Figure III: E-mail exchanges in industrial enterprises



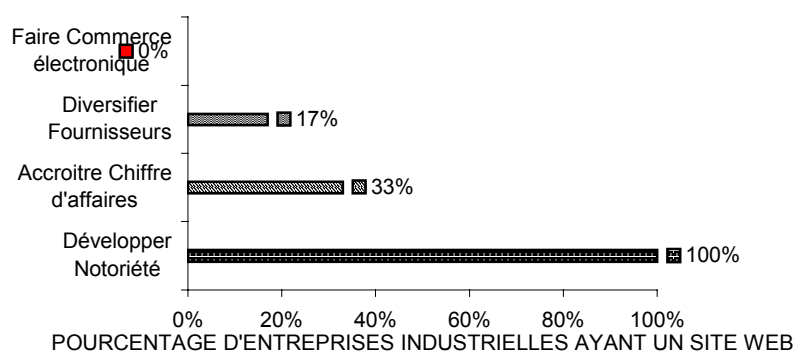
Intensive utilization of electronic mail is only to be found in the branches of the transnationals (19 per cent), the mechanical/metallurgical enterprises (33 per cent), those in the wood and paper sub-sector (20 per cent) and the food and agro-industrial firms (12 per cent). It is carried out mainly by heads of enterprises of French nationality (17 per cent), aged between 51 and 60 years (21 per cent). The Web is used intensively only in 3 per cent of the industrial firms.

Figure IV: Information sought through the web



This low rate shows how far there is to go before a genuine e-commerce “culture” is established in Senegal. The web is very much employed in the branches of the multinationals (8 per cent) and in the chemical industrial sector (13 per cent). Its main user is the head of an enterprise of French origin (5 per cent), aged between 40 and 50 years (5 per cent) and “senior managers” (3 per cent). All in all, industrial firms are still not very aware of the need to be visible on the Net. Thirteen per cent of them have a web site, but none of them are involved in electronic commerce.

Figure No. V: Reasons given for creating a web site



A web site has been set up in enterprises set up with French capital (30 per cent), whose chief is a senior manager (14 per cent). The main reason given for not using this technological invention is that it is commercially useless. This justification is given in 95 per cent of the enterprises connected to the Internet. The cost of creating a site is the argument given by 5 per cent of these companies. Nevertheless, 45 per cent of the industrial units connected to the World Web intend to create their web site by 2002.

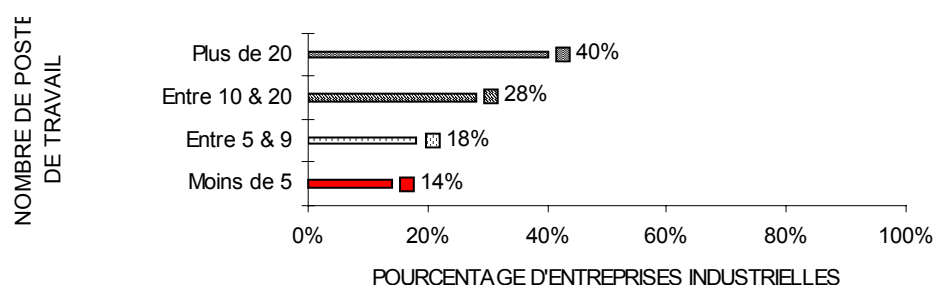
Internet in the Development Strategies of Medium and Large Industrial Firms

In 67 per cent of the industrial enterprises connected to the World Web, Internet is considered as an information and communication tool that is indispensable for their activities. However, there are differences as concerns the extent of its importance : 24 per cent consider it “very important”, 43 per cent as “important”, 22 per cent as “not important” and 11 per cent as “of no importance”. The relative perception of the importance of Internet is especially strong in enterprises which have more than 20 employees (35 per cent), the branches of multinationals (38 per cent) and in which the head of the enterprise is under 40 years of age (60 per cent) and with a senior manager profile (24 per cent).

If Internet is to maximize profits there has to be training of personnel in information technology and the Internet (which has been carried out in 50 per cent of the industrial enterprises connected to the world web) and the creation of jobs concerned with information technology (carried out by 43 per cent of the production units concerned). Furthermore, a so-called professional viewdata is being developed between industry, banks and various businesses in the service sector. Fifty-four per cent of the industrial enterprises connected to Internet benefit, through a viewdata network, from banking services. But only 13 per cent of the enterprises have access to other services through a viewdata network.

Viewdata improves the internal operations of industrial enterprises by giving them easy access to information and a new method of management and data treatment. But all this is closely related to the extent of their information technology use. Only 68 per cent of these enterprises have at least 10 employees.

Figure VI: Information technology stock of industrial enterprises



The average age of IT equipment is less than two years in 84 per cent of the industrial enterprises, which means that the computers have been recently acquired or replaced.

Table 6: IT equipment

Year of purchase or renewal of IT equipment	Percentage of industrial firms
before 1997	10
1997	6
1998	42
1999	32
2000	10

The most intensive acquisition of IT equipment by industrial firms took place in 1998. This was partly due to new ranges of machines and information tools appearing on the market and partly because the use of IT tools became generalized (Intranet and Extranet networks). The enterprises often use software for word processing, making tables and data bases and more rarely use specific software for computer-assisted production. Concerning the latter, the only exceptions noted were the branches of the multinationals and the enterprises set up with French capital.

Using Internet to develop human resources

There is a policy for training personnel which is closely linked to the degree of IT skills in 51 per cent of the firms, of which 10 per cent include specific training in the use of Internet. This policy is to be found more often in the multinational branches, due to the utilization of Intranet and Extranet networks which, for 67 per cent of them, affects the training personnel. The percentage is 64 per cent for the firms whose capital is Senegalese, 38 per cent for those with Lebanese capital and 20 per cent for those with French capital.

The creation of jobs linked to IT and Internet is more advanced in the branches of the multinationals and industrial enterprises with Senegalese capital. There are not more than 3 permanent jobs in 45 per cent of the units with Senegalese capital, 38 per cent in multinational branches, 30 per cent in enterprises with French capital and 13 per cent with capital of Lebanese origin. However, it fluctuates between 3 and 5 permanent jobs in 13 per cent of the multinational branches and 10 per cent of the production units with capital of French origin. It exceeds 5 permanent jobs in 9 per cent of the industrial enterprises with Senegalese capital and 6 per cent of the multinational branches.

Using Internet for commercial purposes

In spite of the fact that 95 and 94 per cent respectively of the exporting and importing industrial enterprises are connected to the World Web, Internet is not yet seen as:

- a powerful commercial tool, even though it transmits all kinds of information in numerical form at lower cost and helps to lower the price of products;
- an effective management instrument for trans-border trade, reducing the general costs of marketing, transport and distribution;
- an appropriate tool for carrying out studies on products and markets, creating and reinforcing commercial ties, optimizing the value added of a product, etc.

And yet the sample highlights the strong dependence of the enterprises vis-à-vis external markets. This is the case for 94 per cent of the units that import inputs, 80 per cent of those that export finished products and 74 per cent of those that are both importing inputs and exporting finished products. The connection to the World Web is made by two categories of enterprise. The first category exports finished products to the countries that are members of WAEMU³ (the highest rate of connection to Internet is 97 per cent); to neighbouring countries⁴ (96 per cent); to France (88 per cent), to other countries⁵ (86 per cent) and to the rest of Africa⁶ (71 per cent). The number of industrial enterprises connected to Internet varies according to whether their exports are to countries close by or to France. The second category, which import inputs, have

³ These are: Benin, Burkina Faso, Côte d'Ivoire, Guinea Bissau, Mali, Niger, Togo

⁴ Gambia, Guinea Conakry, Mauritania

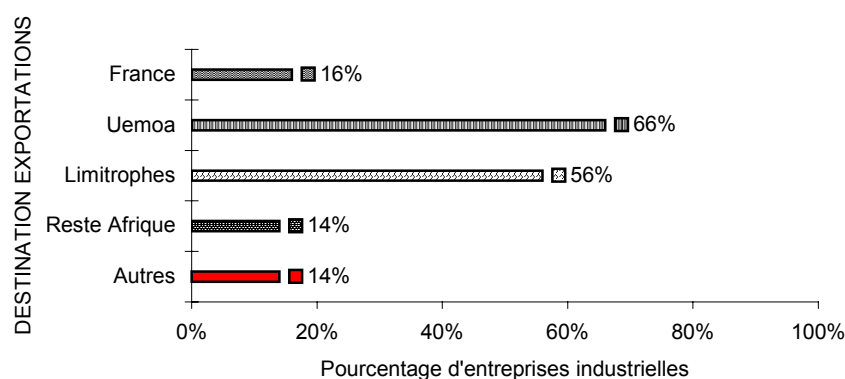
⁵ Except for France, WAEMU countries, neighbouring countries, rest of Africa

⁶ Except for WAEMU countries and neighbouring countries

a variable rate of connection: 98 per cent of the firms importing their inputs from France, 78 per cent when the WAEMU countries are their suppliers and 67 per cent when the inputs come from other neighbouring countries. Many firms connect to Internet when the imported inputs come from distant countries or from France.

Research for information of a general nature (regulatory, juridical, fiscal and financial) and of a professional nature (clients, input suppliers, equipment supplies) via the Web is not very advanced in the industrial firms exporting finished products or importing inputs. Both these categories have an identical percentage of usage: 3 per cent. For the heads of industrial enterprises, this low rate is above all due to the characteristics of their markets. Thus the export of finished products which figure on the assets side of industrial firms depends mainly on a few country-clients: to neighbouring countries and WAEMU members.

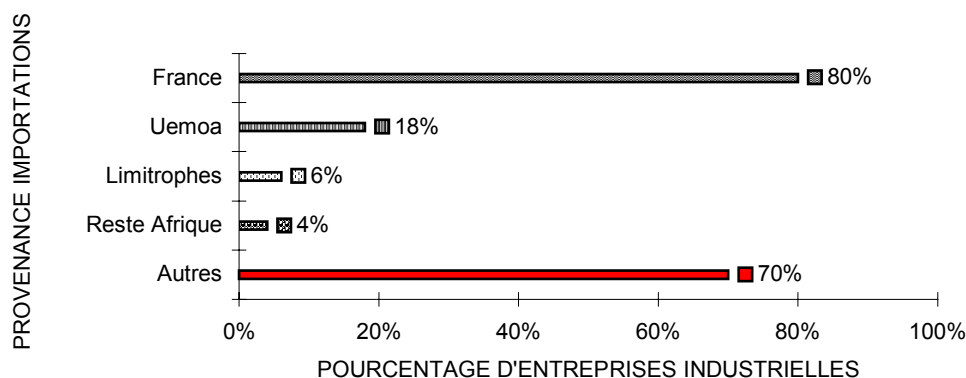
Figure VII: Destination of finished product exports of industrial enterprises



The heads of the enterprises that were studied consider that their products do not have a comparative advantage, in terms of competitive price and quality, except for the markets of WAEMU and ECOWAS, as well as for those of neighbouring countries. They do not consider that Internet can help create or consolidate commercial ties in these nearby countries because of the poor quality of telecommunications in most of the ECOWAS countries, the lack of reliable information on the Net and the absence of certification of electronic signatures.

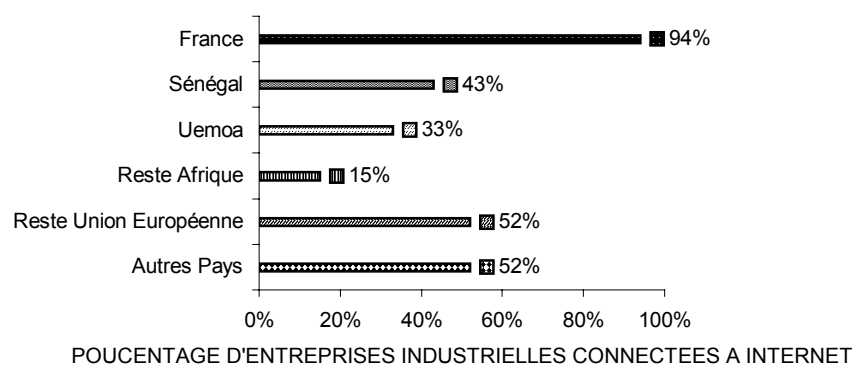
Inputs are invariably imported from only a few supply countries (France, Germany, Brazil) even though, in 58 per cent of the industrial firms, the Web is used to find other suppliers.

Figure VIII: Suppliers of inputs to industrial enterprises



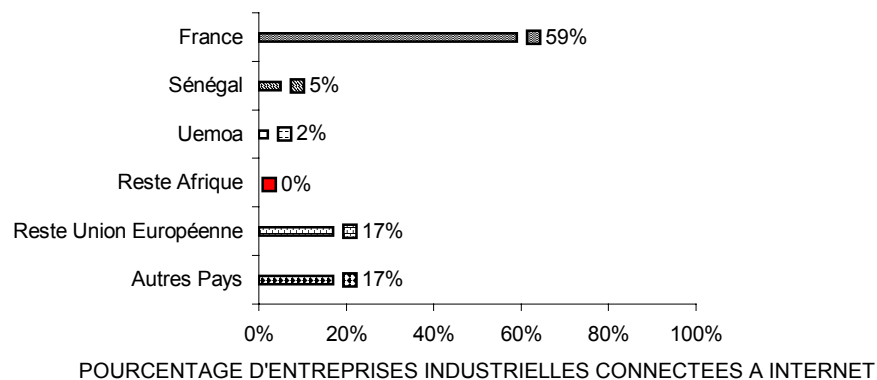
This situation shows that the Web is poorly utilized, in other words it does not contribute to a diversification of input suppliers that are not supported by the enterprise management or the head office (in the case of the multinational branches). This is confirmed by the destination of e-mails, which are sent to France by 94 per cent of the industrial enterprises.

Figure IX: Destination of e-mails



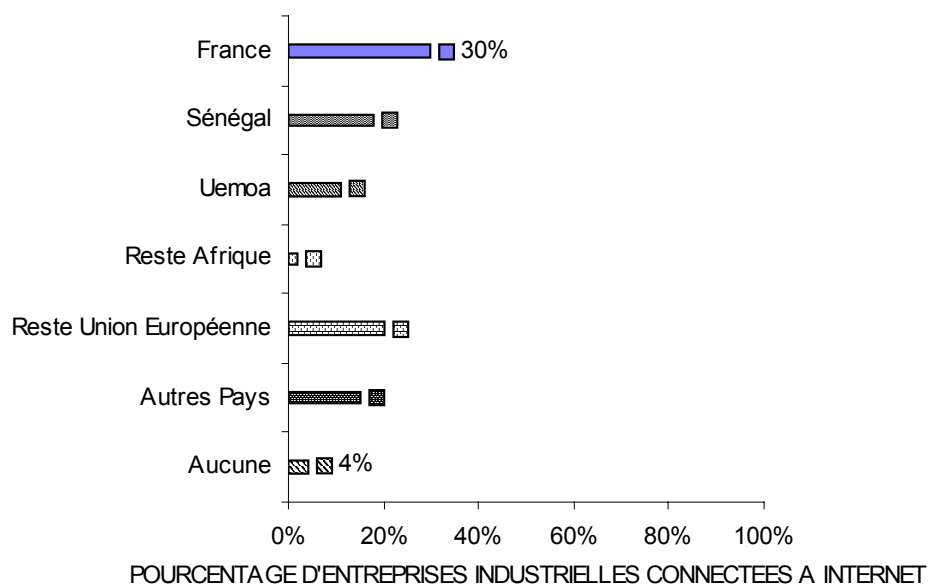
France is the first destination of e-mails for 59 per cent of the industrial enterprises.

Figure X: First destination of e-mails



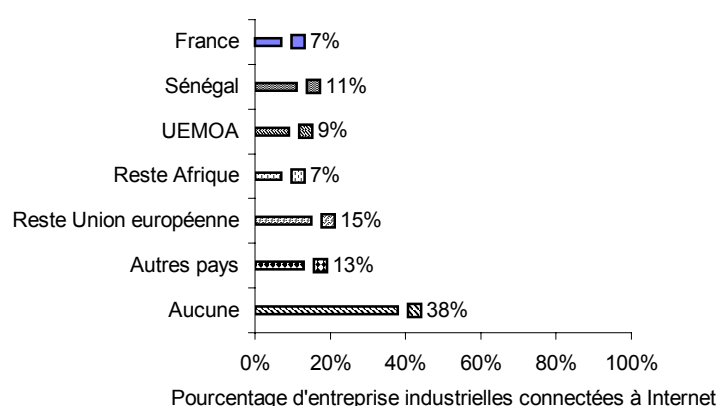
Four per cent of the enterprises have no second destination of their e-mails.

Figure XI: Second destination of e-mails



For 38 per cent of industrial enterprises there is no third destination of e-mails.

Figure XII: Third destination of e-mails



This under-utilization of Internet by industrial enterprises is clearer still when e-mail exchanges are examined in function of the destination of exports. Of the 66 per cent of enterprises that export finished products towards the countries of WAEMU, none of the latter figure as the first destination of electronic mail, only 13 per cent figure as second destination and 9 per cent as third destination. Out of the 56 per cent of the units exporting finished products towards neighbouring countries, none counts them as first, second or third destination of their electronic mailing. The same can be said for the origin of imports. Thus, of the 70 per cent of enterprises importing inputs from other countries, 20 per cent are the first destination of their electronic correspondence, 17 per cent as the second destination and 9 per cent as the third destination. Furthermore, industrial enterprises that are importing inputs are more active on the Net than their counterpart exporters of finished products. The respective percentages are 14 and 11 per cent.

These low percentages show that a web site is not yet seen as a necessity, in spite of the strong dependence on external markets. The percentage of industrial units that are connected to the Internet and who have expressed their intention to be on the Net by 2002 is higher when they are exporting finished products (47 per cent) than when they are importing inputs. The reasons given by firms that have no intention of creating a web site are that it is not commercially useful (for all those who export finished products and 95 per cent of those importing inputs) and that it is costly (for 5 per cent of the enterprises importing inputs).

This under-utilization of the Internet is all the more regrettable in that the world market has a considerable influence on the 56 per cent of the enterprises involved in the main organized markets of primary commodities (forward markets, markets of negotiable options on contracts with expiry dates) and with the fluctuations of the American dollar. In sum, there is absolutely no correlation between the extent of influence of the world market and the use of the Web to search for general and professional information.

Using Internet for commercial co-operation with partners

Banks and financial institutions

Twenty-eight per cent of the industrial enterprises use electronic mail in their relations with banks. This method of communication is particularly well exploited by the branches of the transnationals (50 per cent), the businesses with capital originating from France (30 per cent), those exporting finished products (32 per cent) and those importing inputs (25 per cent).

The banking sector makes considerable efforts to provide a range of services through viewdata for industrial enterprises. At the time of our survey, 54 per cent benefited from such services.

Ministerial departments

There is no exchange of electronic messages between the industrial enterprises and the Administration services. This is evident from the way in which the latter are poorly equipped in computers and the low level of their connection to Internet. Thus, in spite of the desire of the public authorities to promote this technological instrument, the Administration is still far from having mastered it. This is not only a brake on the development of the Internet but also an obstacle in getting businessmen involved in an Internet culture.

Employer associations and professional organizations

The use of electronic mail in the exchanges between industrial enterprises and the private sector (employer associations, professional organizations, embassy commercial attachés) is almost non-existent. The SPIDS, the employers federation which is a member of the National Employers Council (CNP), is the only organization of the private sector (OSP) that uses electronic mail to collect, process and distribute information to its members. There is no Internet in the possession of employer associations, like the CNP and its 18 professional federations (except for SPIDS), the National Confederation of Senegalese Employers (CNES), the National Union of Senegalese Traders and Industrialists (UNACOIS), the Economic Grouping of Senegal (GES), the Organization of Traders, Farmers, Artisans and Industrials of Senegal (OCCAIS), etc. All these structures continue to use the traditional methods for collecting, processing and distributing information.

Given this situation, UNDP and UNIDO are supporting a programme to create awareness of the use of Internet and an information system. The great challenge remains that of the usefulness of the information put out by the private sector organizations for their members through their own web sites. All heads of enterprises lament the absence, on the Internet, of any « Senegalese » content that is useful for their activities.

It should also be noted that there is a lack of awareness of the need to keep up with technological innovations among most of the heads of enterprises. Only a minority realize the importance of general and professional information for the development of entrepreneurial activities.

Development partners

There is almost no recourse to Internet in the exchanges between industrial enterprises and their development partners in the context of Senegalese bilateral and multilateral assistance. The only support structure to the private sector (set up by the European Community) uses this new technology in its relations with industrial enterprises. Its programme, European Business Assistance Scheme makes it possible to download assistance application forms.

The Obstacles to Using Internet

Even if a broad movement is inducing an increasing number of industrial firms to be interested in the Internet, still relatively few have understood the advantages offered by this technology and make use of it. The heads of enterprises have singled out five main obstacles. The first concerns virus transmission : it was cited by 43 per cent of the industrial firms. Accordingly the only steps taken have been to separate the connection to the world network of work stations concerned with administrative management, accounts and production. Fear of malfunctioning in the computerized management system on the Internet is strongest when the head of the enterprise is of French origin (52 per cent), followed by those of Senegalese origin (36 per cent) and those of Lebanese origin (33 per cent).

Confidentiality of information rate second in the list and it was cited by 43 per cent of the industrial enterprises. Their heads said that information could be intercepted and modified by a third person. Security and Internet are still, for many of them, two irreconcilable terms. To deal with this security problem within the enterprise, access to the Internet is limited and, at the end of each day, all the electronic messages that have been sent are checked by one of the managers.

The third obstacle concerns the low rate of appropriation/utilization of Internet by commercial and non-commercial partners. This reason was cited by 75 per cent of the industrial enterprises, whose heads said that Internet was not greatly used by partners such as clients, suppliers, banks, insurance companies, development partners, etc. The diffidence of the Administration towards Internet was highlighted by 95 per cent of the industrial enterprises, whose heads felt that this penalized them in their administrative procedures and was costly in terms of both time and transport. They expressed the need for administrative forms to be put on line so as to simplify the gathering of data. According to them, Internet facilitates the decentralization process and helps solve the problem of urban transport in Dakar.

Furthermore, while the computerization of the Administration is a priority for the public authorities, it is essential to resolve the deficit in the local production of content useful for entrepreneurs and even for private citizens. The heads of enterprises would like to consult and download legislative and regulatory texts through the Internet.

Profitability that is difficult to evaluate is the fifth and last obstacle, which was mentioned by 85 per cent of the industrial enterprises. This can be explained by the fact that Internet, which is considered as a management tool, requires high technical

qualifications. Surfing on the Net and searching for information requires an amount of time that is disproportionate to the results yielded (a problem linked to the quality of the network and the exponential growth of demand). Furthermore, it is difficult to know at what moment the surfers are going to respond to offers of products and services that have been put on the World Web. Lack of knowledge about safe methods of payment is another aspect of this problem, but setting up a transaction system would require an expensive security infrastructure.

Conclusion

The industrial enterprises use Internet frequently through their electronic mail. But it has not made great changes in their operation methods. This is explained by a series of factors : they do not use the Internet for electronic commerce (which opens up possibilities of developing internal and external trade) ; there is a lack of « Senegalese » content that would be useful in the activities of enterprises ; and the Administration, private sector organizations and their different partners (commercial and non-commercial) are under-equipped or completely lacking in information technology equipment.

A number of steps need to be taken to help industrial firms benefit from all the technological changes, to create or reinforce commercial alliances, to develop new products or services for new markets and to make important transactions. There needs to be training in the preparation of web sites for electronic commerce, in the setting up of digital libraries and web gateways and in the presentation of demonstration models of virtual exhibitions and of transactions on protected lines.

The main advantage for an enterprise active on the Net is that its size does not matter on the network. Hence, the private sector organizations, the development partners in bilateral and multilateral co-operation should all work together in this field.

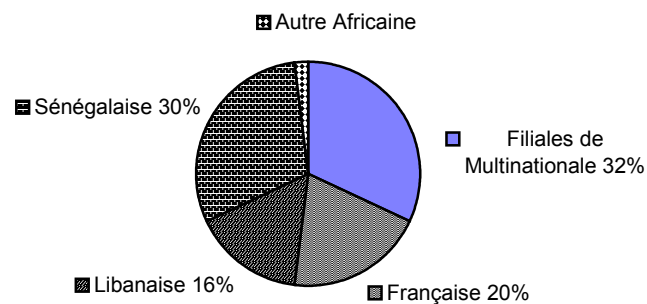
It is up to the State to promote the development of « Internet content » by putting on line the administrative forms and various services intended for enterprises and citizens. It also has an educational role to play by adopting the new information and communication technologies, particularly the Internet.

Annexes

Annex 1: Main findings of the sample survey on medium and large industrial enterprises

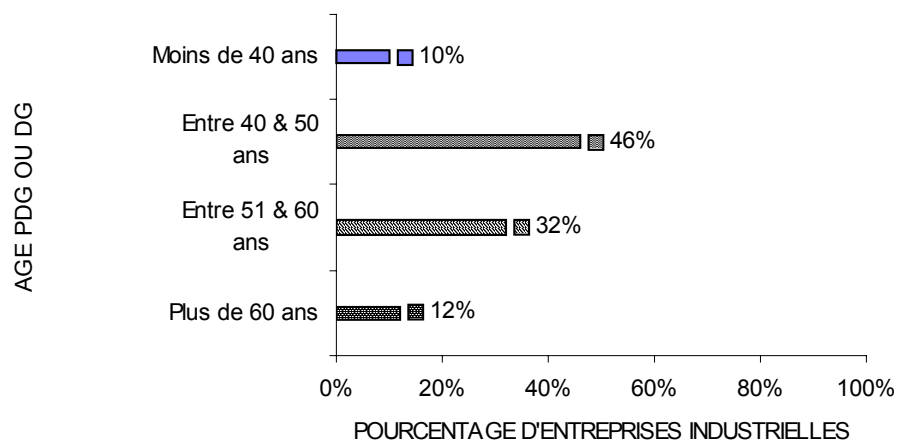
Predominance of foreign capital (70 per cent of the industrial enterprises).

Figure XIII: Origin of the capital of industrial enterprises



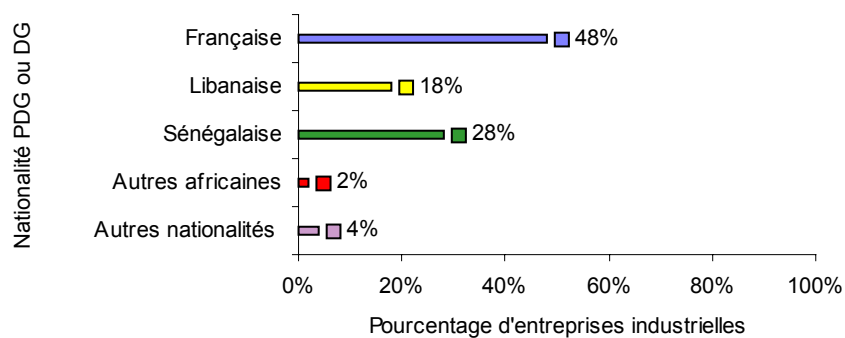
Age of the heads of enterprises: few of them are less than 40 years old and 46 per cent are in the most important age group, that of 40 to 50 years old.

Figure XIV: Age of the managing director of the industrial enterprises



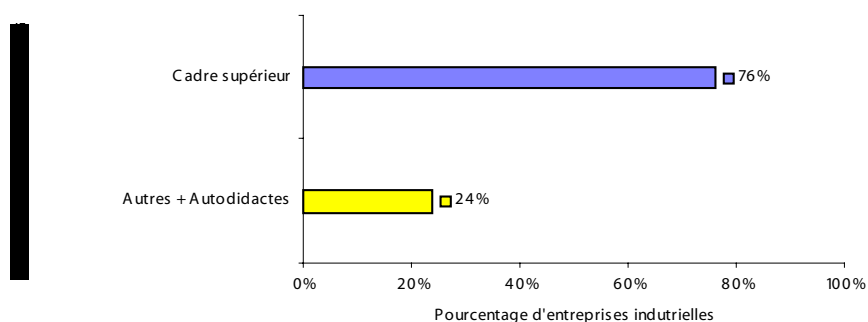
Original nationality⁷ of the enterprise heads: almost half are of French nationality.

Figure XV: Original nationality of the managing directors of industrial enterprises



Level of education/training⁸ of heads of enterprise : a quarter correspond to the profile of technician or those who are self-taught.

Figure XVI: Level of training of managing director of industrial enterprises



⁷ By “other Africans” is meant those of African nationality other than Senegalese ;
By “other nationalities” is meant French, Lebanese, Senegalese, and “other African” nationalities

⁸ Profile of senior manager = BAC + at least 4 years of further studies
Profile of technician, self-taught = less than BAC + 4 years of further studies

Annex 2: The firms surveyed

Name of firm	Sector
1. SOBOA	Food
2. SAPROLAIT	Food
3. Noujaim	Food
4. CHOCOSEN	Food
5. SENTENAC	Food
6. SOCAS	Food
7. IKAGEL	Food
8. NESTLE	Food
9. BDM	Food
10. SEDIMA	Food
11. CDA	Food
12. MTOA-SAI	Food
13. GINA	Food
14. SONACOS	Food
15. VALMER	Food
16. INTRAF	Food
17. GMD	Food
18. NMA	Food
19. SAI	Wood/paper/cardboard
20. SIPS	Wood/paper/cardboard
21. Rochette	Wood/paper/cardboard
22. CAFAL	Wood/paper/cardboard
23. Le Bois	Wood/paper/cardboard
24. SIC	Wood/paper/cardboard
25. SIGELEC	Chemicals
26. SEGOA	Chemicals
27. Colgate	Chemicals
28. SOPROKA	Chemicals
29. Seigneurie	Chemicals
30. Rhone Poulenc	Chemicals
31. PARKE DAVIS	Chemicals
32. Valdafrique	Chemicals
33. ELF Oil	Chemicals
34. Transtech Industries	Chemicals
35. CCIS	Chemicals
36. SENELEC	Water/electricity
37. SDE	Water/electricity
38. PROCHIMAT	Mining/extraction
39. SSPT	Mining/extraction
40. SOCOCIM	Construction materials
41. FUMOA	Mechanical/Metallurgical
42. SENEMECA	Mechanical/Metallurgical

43. SISMAR	Mechanical/Metallurgical
44. Q-FONDS	Mechanical/Metallurgical
45. DIPROM-SITRA-TOUBA GAZ	Mechanical/Metallurgical
46. CARNAUD	Mechanical/Metallurgical
47. COTOA	Textiles/leather/ready-made clothing
48. CCV	Textiles/leather/ready-made clothing
49. SOSEFIL	Textiles/leather/ready-made clothing
50. NSTS	Textiles/leather/ready-made clothing