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

Philippe Barry and Hamidou Diop

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UNRISD, Palais des Nations
1211 Geneva 10, Switzerland

Tel: (41 22) 9173020
Fax: (41 22) 9170650
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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 inefficacity 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.

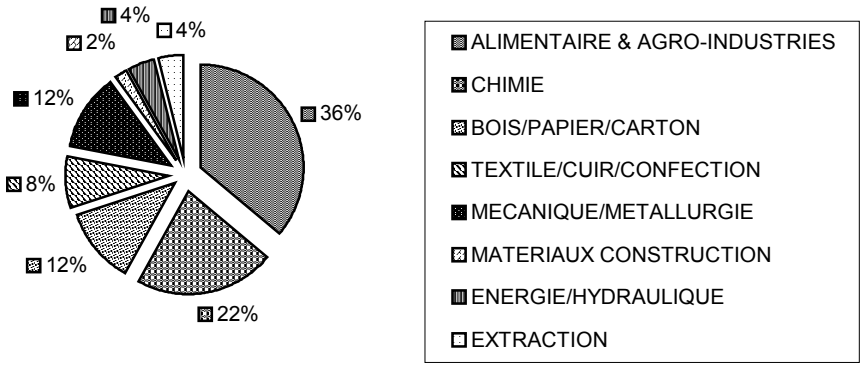
The methodology used in this study is carried out in five phases:

- 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 I: 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

- 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 Attapulgite (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 Pro[2] 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.