

Quantitative research

Research purposes and methods

The quantitative study, conducted on a sample of over 2,700 enterprises with at least three employees registered with the Commercial Register at the Chamber of Commerce in Lombardy, investigated some crucial aspects concerning the use of Information & Communication Technology in Lombard enterprises. In particular, the research responded to the following objectives:

- Find out the level of information technology in Lombard enterprises: hardware equipment, computerized functions, existing skills and what is lacking;
- Estimate and further study the use of Internet and the development of e-Business, individuating the models and behaviors put into practice by the enterprises and testing the first results;
- Monitor the growth of projects in ICT applications in the near future to have indications on the development of demand in the short run;
- Further study the objectives and the functions of Web activities, their impact on sales and on the commercial activities of the enterprises.

The sample was made by random extraction that was stratified by six sectors (primary, secondary, commercial, hotels and restaurants, services to businesses, services to people), by four dimensional classes (3-9, 10-49, 50-99 and from 100 employees up) and by four territories (Milan, Cremona-Mantua-Lodi-Pavia, Bergamo-Brescia, Como-Lecco-Sondrio-Varese). A preliminary selection was made: the enterprises extracted and contacted, in fact, were asked if they had access to Internet in order to only survey ones that responded affirmatively. By means of this selection it was possible to gather the first data on the spread of the Web: 59.2% of Lombard enterprises had an Internet connection and 47.8% of them had Web business. Only 42.9% of those who did not have any business intended to start one in the near future.

The level of information technology in Lombard enterprises

The inclination of Lombard enterprises to use information technology (tab. 1) is shown by data on the diffusion of PCs (over one for every two employees), by the work stations with access to Internet (two out of every five employees) and by the e-mail boxes (over one for every three employees). At the same time, however, the high percentage of enterprises with one PC at the most for every five employees (23.5%) is worth highlighting.

The level of computer skills is considered good: over 50% of personnel have basic computer skills (use of word processing programs and calculation sheets). However, these skills are not uniformly distributed: in more than half of the enterprises the percentage of employees with basic ICT skills does not exceed 40%. The diffusion of more specialized computer skills is even rarer, which is significant only in the tertiary sector, thanks also to the smaller presence of "blue collars" in the enterprises.

	PC	Internet stations work	N° of e-mail boxes per employee	Basic computer skills	Specialized computer skills
Up to 2 every 10 employees	23.5	39.5	47.0	27.0	85.6
From 2 - 4 every 10 employees	30.2	29.2	28.0	25.1	9.1
From 4 - 6 every 10 employees	12.0	8.7	7.8	11.4	1.8
From 6 - 8 every 10 employees	11.8	7.7	5.8	11.0	1.1
From 8-10 every 10 employees	12.5	8.8	7.9	25.5	2.4
More than one per employee	10.1	6.1	3.5		
Total	100	100.0	100.0	100.0	100.0

Tab. 1: Diffusion of computer equipment and Ict skills for every 10 employees (% of total of enterprises)

The need for specific skills is satisfied by turning to *outsourcing*: in 41% of the cases the management of ICT and Web activities is totally delegated to external consultants. On the contrary, 35.3% of enterprises only use internal personnel, generally not specifically dedicated to that function. In 25.3% of the cases there is a mixed management in which both internal personnel and external consultants participate in ICT activities. The choice and the evaluation of the supplier is based on acquaintances and word of mouth in the majority of cases.

Lombard enterprises and the Web

The study enabled also appreciating the different availability of Internet connections based on the company characteristics. In fact, the connections are more frequent:

- ***In larger-sized enterprises*** – if only 49.3% of microenterprises (from 3 to 9 employees) have internet connection, such a percentage rises to 86.7% if small enterprises (10-49 employees) are taken into consideration;
- ***In the B2B tertiary sector and in manufacturing*** – the business to business tertiary sector and manufacturing are the sectors which are most oriented towards ICT, as far as the diffusion of access to Internet is concerned and the development of Web activities. On the contrary, commercial companies have a definitely lower level of Web activity compared to their diffusion of Internet access. The agriculture sector is at the tail end for Web activity, even if a growing intention on behalf of the enterprises in this sector to develop Web business in the near future is highlighted;
- ***In the province of Milan compared to the rest of the region*** – The Milanese area has the greatest diffusion of Internet access and development of Web business. The area of Mantua-Cremona-Lodi-Pavia is in second place, followed by the Bergamo-Brescia area and finally the Como-Lecco-Sondrio-Varese area;
- ***In cooperatives and companies*** – the datum that shows cooperatives as the enterprises most committed to the development of Web business and the diffusion of Internet access is surprising.

The data concerning the enterprises that have experimented with using the Web for the purpose of business highlight a considerable individualism: the almost totality of enterprises that have experimented with Web business, in fact, carried out the activity independently, without joining any collective initiatives. Vice-versa, the few enterprises that have experimented with the participation in *Mall* or *e-Marketplace*, expressed a substantial dissatisfaction proven by the highly frequent interruptions of such activities (27.8% against 5% registered by the companies that have independently managed web activities).

Concerning the use of Internet, the activities considered to be the most important are research for information and e-mail, followed by e-banking (considered very important by 37.5% of the enterprises). The possibility of having access to company data bases appeared to be less important and the use of the Web in relations with the Public Administration and for e-commerce is still limited. Instead, the use of intranet is low, present in only 29.3% of the sample and foreseen in short-term plans by only 1% of the enterprises. Intranet is present above all in larger-sized companies (66.5% of enterprises with at least 100 employees; 54.2% of those with 50-99 employees; 19.4% of the microenterprises) and it is used above all for administration and management control and for access to company data bases; less for internal communications (58.4%).

	Average	% votes 8-10
Internet to search for information	7.0	45.5
Electronic mail	6.6	43.5
Internet for bank transactions	5.5	37.5
Possibility of access to company data banks	5.1	27.8
Internet for Public Administration	3.2	12.2
Internet to buy/sell	3.0	9.2
Intranet connection	2.9	15.9

Tab. 2: important aspects for the activities of enterprises (average of votes and % of 8-10 on a range of 1-10)

Based on the data collected a differentiated analysis of the sample of enterprises can be made based on the level of Web activity developed and on the interest declared in such activities:

Enterprises not interested in Web business – 42.6% of the enterprises that have Internet connection are not interested in developing a Web business in the short term. In general, such an orientation is dictated, in the case of microenterprises and small enterprises, by an idea that such activities are useless for their type of business or by a group of evaluations which do not define Web business as a priority or particularly advantageous, therefore it does not justify the investment. Only elements that demonstrate the effective utility could convince enterprises to overcome their diffidence and reconsider their current positions. In the case of larger-sized companies, however, the main motivation is that Web businesses are managed by the parent company or by another company in the group they belong to.

Enterprises that intend to start up a Web business – 8.4% of the enterprises do not have a Web business but intend to start one up. 64.7% of them will do it by the end of the year and another 21.5% within the next two-three years. The objectives stated are mainly for communication and promotion, followed by efficiency in relationships with clients and suppliers and the creation of new sales channels (44.7%). The functions attributed to web business are mainly for information. Among the obstacles signalled, the lack of internal skills and the difficulty in evaluating the yield on investments and the guarantee of data protection are underlined. The average cost foreseen for the creation of a Web site and/or the start up of a Web business is a little higher than 2,000 Euros, lower compared to what those who already have a web business sustained.

Enterprises with Web business – Above all, enterprises with greater computer pervasiveness have a Web business for the purpose of mainly promotion or communications, even in new markets. They are followed by efficiency purposes for relationships with suppliers and clients and only residually, the creation of new sales channels, which interests over a third of enterprises with a web site.

The main function of the Web is for information, performed by the majority of sites; then the commercial function emerges, present however in smaller measures. Secondly, the site is used to manage communication among employees and for entertainment activities.

The average cost of starting up a Web business is 6,500 Euros. However, this average value is scarcely indicative, given the great variability that emerges from the sample: from minimum costs for those who have developed a Web business on their own to the cases of some medium-large enterprises that have sustained an investment of around 1.5 million Euros. The extreme variations in the sample is also marked by the updating and maintenance costs: for everyone who does not sustain updating costs, there is someone who declares annual costs of 150,000 Euros.

Some results, on average positive, can be provided for the enterprises that have started selling or supplying online. Almost 20% of clients buy online; online sales represent on average 25% of the total turnover and in the past year they have increased by 13-14%. 21% of the total suppliers are online and the supplies amount to 19% of total purchases. A growth in e-procurement by 8.6% in the last year has been recorded.

Enterprises that have developed e-Commerce have recorded a positive effect not only on quantitative development but also on the qualitative development of sales; in particular it has effectively acted on broadening the geographical sales area, on the quality of customer assistance, on the efficiency of internal processes and the optimization of logistics. The impact of the online integration with suppliers is more limited, which in any case has been significant with reference to the efficiency of internal processes and the reduction of costs.

All in all the enterprises that have started a Web business are satisfied with their investment. Only 15.7% of the enterprises is not that satisfied. Only 2% of these enterprises does not have faith in the future.

The variables that influence the probability of having a Web business

Overall, the variables that greatly affect or block the possibility of having a web activity are, in the following order:

1. ***the sector the enterprise belongs to*** – the business to business service and business to people service sectors are more inclined to developing a Web business; the commercial, hotel and restaurant, the construction and agriculture sectors are less inclined. The influence of the sector, on one hand, is tied to the importance of the physical proximity in some businesses, which makes the use of the Web less important, on the other hand, it is deeply rooted in the minor openness to innovation and to the international competitiveness of Lombard enterprises active in agriculture and in more traditional tertiary sectors.
2. ***The habit of using ICT and its pervasiveness in different company functions*** – The computerization process is gradual, above all in the phases that lead to greater organizational changes. Experimenting with technologies favors *learning by doing* processes and the growing advantages that lead to a greater inclination towards the options offered by Internet, including Web business.
3. ***The size and structure of the enterprise*** – The discriminating factor also for starting up a web business appears to be that of the microenterprise.

4. ***Having an international market*** – Enterprises that compete in broader markets are more stimulated by the competition to innovate and experiment with new tools, with the purpose of acquiring competitive advantages or keeping up with market evolutions.

The main models in Web business

The analysis of data has enabled individuating three different modes for the organization of company Web activities inside of which the sample enterprises are grouped:

- ***Enterprises with “informational Web activities”*** – they have a Web activity designed to provide information on the company and its products/services, in line with the communication and promotion objectives. This is the most numerous cluster (61.5% of the sample of enterprises with web activity and 17.4% of the Lombard enterprises with at least 3 employees). The Web business, in 40.3% of the cases, has been started up in the last four years; the informative site is in many cases the first step in a process to develop a more complex activity. The creation of a site of this kind does not require substantial investments nor great skills, even if the quality of the sites created can be very different. Generally, external suppliers are relied upon for the start up (68.3% of the cases) and the maintenance (57.4%) and the average costs of the start up are lower than the overall average of the sample. A significant part (20%) is not very satisfied, but almost as many (17.6%) have faith in the future.
- ***Enterprises with “commercial Web activities”*** – they are enterprises that have a direct site not only to provide information but also to facilitate buying and selling, to communicate with clients, provide order forms, integrate activities with those of suppliers, buy and sell online, even if such functions are not already working. This cluster includes 22.7% of the enterprises with a Web activity (6.4% of the reference universe) and it is equally made up of microenterprises and medium-large enterprises.
Next to the promotional objectives, the search for ways to make relations with clients and suppliers more efficient was very important in the start up of a Web activity as well as the creation of new sales channels. Often, in fact, the activity of sales is integrated with other company functions (marketing, customer service, administration and production) and supplies is integrated with administration, warehouse management and production. E-business is therefore developed not only with the purpose of building new commercial channels but also for improving the efficiency in the management of the enterprise and its relations along the supply chain.
In 60.7% of the cases, the start up of a Web activity is entrusted to an external company that works side by side with the internal personnel. The satisfaction level is extremely high in 41% of the cases and average in 52% of the cases.
- ***Enterprises with “uncharacterized Web activities”*** – This is the least numerous group (15.8% of the enterprises with a Web activity) and two-thirds of it is made up of microenterprises, whose Web activities are not tied to pursuing clearly defined objectives. The Web sites are usually weak under the informational profile and do not have the purpose to support sales activities. In many cases, the start up of a web activity has been casual, tied to the entrepreneur’s one specific interest or stimulated by external solicitation, by suppliers or even by the presence of other opportunities (for example, the possibility of taking advantage of public and bank financing).
The start up costs of the Web activities were relatively high, similar to those in the group with a commercial web activity, but, in the majority of cases (54.1%), the start up and maintenance of such activity is followed internally by the entrepreneur or by collaborators (internal or external),

with many even turning to internal personnel who are not responsible for the project. Despite of the high costs, the enterprises state that they are very satisfied (34% of the sample) or quite satisfied (54.5%) with the investment made.

The needs of ICT skills and e-learning

About half the enterprises with Internet connection are convinced that they do not need further ICT skills. Only 30% expressed a need that mainly concerns basic skills (the use of main applications, software, Internet for looking up information) and the skills directed at communication and sales and, on a smaller note, the skills needed to manage data bases, projects and networks. The awareness of the need for ICT skills is closely tied to the level of pervasiveness of the technologies inside the company: enterprises that have a greater use of information technologies are the most sensitive to the need for new skills. Consequently, the low demand for new skills is above all the reflection of a computerization process that is still not adequately widespread.

The functional areas in which greater skills are needed are sales (in all its phases from marketing to relations with clients) and those most interested in computerization processes (information systems, administration, data bank management). The enterprise intends to face the lack of skills above all through training of internal personnel and secondarily by the use of external collaborators. Hiring new employees is excluded.

The request for e-learning is on average quite low (26.5%), it is greater in more computerized enterprises (35%) and/or ones that are more sensitive to the need to increase their skills (38%). It is important to note that a process of gradual sensitization to e-learning is in progress, however, it is hardly able to be transformed into a real demand. Enterprises that do not believe in e-learning consider it ineffective and they criticize the lack of interaction with teachers and the lack of time. Those who believe it is useful appreciate the possibility of autonomously managing times, of choosing contents, reducing costs, making space more flexible and personalizing interventions.

Conclusions

The transition towards the economy based on Internet still involves a small percentage of enterprises: over 4 enterprises out of 10 are isolated from the Net, that is they do not have the possibility of connecting and exchanging information and data via computer. Those excluded from the Web are mainly microenterprises active in more traditional sectors, involved in businesses that require physical contact with the client.

The study concentrated on enterprises that have Internet connection, among them a good diffusion of equipment and basic computer skills can be observed. An approach of gradual adoption, yet irreversible, of ICT seems to prevail in these enterprises and it is used to increasingly explore different options. Among the opportunities offered by Internet, e-commerce does not appear to be the main objective of the enterprises, for the reason that the goods and services offered cannot always be exchanged online and also because the faith in e-commerce has been lost due to the unfulfilled optimistic forecasts in the recent past and finally because it requires organizational and cultural changes that need time to be assimilated.

Enterprises seem to be more interested in other applications which let them more easily perceive positive effects and do not require radical changes in their organizational structure; applications they have understood and feel they are able to manage more simply: "showcase" sites in which they

can present their products and services to a potential global market and create a communication channel with clients; applications dealing with administration or the management of data banks; the use of Internet for electronic mail, the search for information and in relations with banks: on the contrary, enterprises are on hold as far as applications that require greater organizational changes: solutions for e-commerce and for the management of production or human resources.

The start up of a Web activity, especially those with commercial purposes, generally intervenes in enterprises that already have a widespread use of Internet. Though not only limited to medium-large enterprises, it involves only a part of the small ones: larger-sized companies have more resources available and are the first to take advantage of opportunities, while the small ones do not seem interested or have been disappointed by the collective ways of being present on the Web (for example, participating in e-marketplace), which would in any case be significantly cost-saving.

If the declarations of intentions are considered next to the data that photograph the current situation, it seems that the computerization process can be accelerated in a short time: many enterprises plan to strengthen ICT applications, above all those involved in commercial activities. In any case, it is difficult to put forth predictions on the speed with which this development will take place in the future.

Enterprises need time to understand what the yield from ICT investments could be. Some, more innovative and visionary, have decided to experiment and have anticipated the competition; others have preferred to wait to have a more complete vision. Today, there is an adequate experimental base and above all the results of those who have sustained major investments in ICT technologies are comforting.