EXECUTIVE SUMMARY

The present report outlines the general level of information society development in Emilia-Romagna from 2006 to 2007. In particular, the focus will be on companies and inhabitants, in their being ICT end-users, and on infrastructures and broadband services, as essential components for an ICT-friendly environment.

ICT AND INTERNET DISSEMINATION IN EMILIA-ROMAGNA COMPANIES

The Fourth edition of the survey regarding the dissemination of ICT in the companies of Emilia-Romagna has covered a sample of 396 companies, representing 20% of the area of reference, and belonging to 3 sectors, which are quite important for the regional economy: Agri-food, Tourism and Multimedia.

Basic equipment, such as broadband connections and protection technologies, are reported to be widely disseminated. Essentially, all agri-food, tourist and multimedia companies in Emilia-Romagna, are equipped with PCs with Internet connection. 76% of companies with access to the Internet are equipped with DSL connection, with transmission speed higher than 2 Mbit/s in 57.6% of cases. Wireless (2.8%) and fiber optics (3%) connections are instead residual. Broadband is more present in the Multimedia and Tourist sectors, with respect to Agri-food, where in 40% of cases Internet surfing is performed at a speed lower than 2 Mbit/s (25.3% and 24.4% are figures for the other two sectors). Please note that around half of the companies (46.6%), which are not provided with broadband, do not consider it necessary. There is a generalized presence of internal networks (LAN), found in 80.4% of companies, while only in tourist companies there is a good presence of wireless (LAN) networks, in 48.3% of cases. Finally, the number of companies using VoIP, is still relatively low (13.7%); it is mostly found in the Multimedia sector (ca. 20%; in the other two sectors, the figure drops to 10%). The company size is very important in ICT dissemination. In agri-food companies with more than 250 employees, wireless LAN, intranet and LAN are present, for instance, in more than 80% of cases, while VoIP in 70% (Chart 1). IT security is a matter for concern: 81.4% of companies are equipped with firewall devices; 61.7% with SSL server, and 55.1% with IDS (Intrusion Detection System). Automatic data backup is periodically carried out in 94% of companies, and the presence of disaster recovery plans is rather frequent (45.5%). Finally there is a limited interest in the training of staff concerning IT security, as it is found in 35.7% of companies.

As regards ICT and Internet use by companies, the analysis reports a rather diverse picture, showing that investments are focused on sectors and functions which, in individual fields, contribute the most to the onset of a competitive edge.

In Agri-food, for example, the supply chain has been mostly digitalized, as well as integrated management

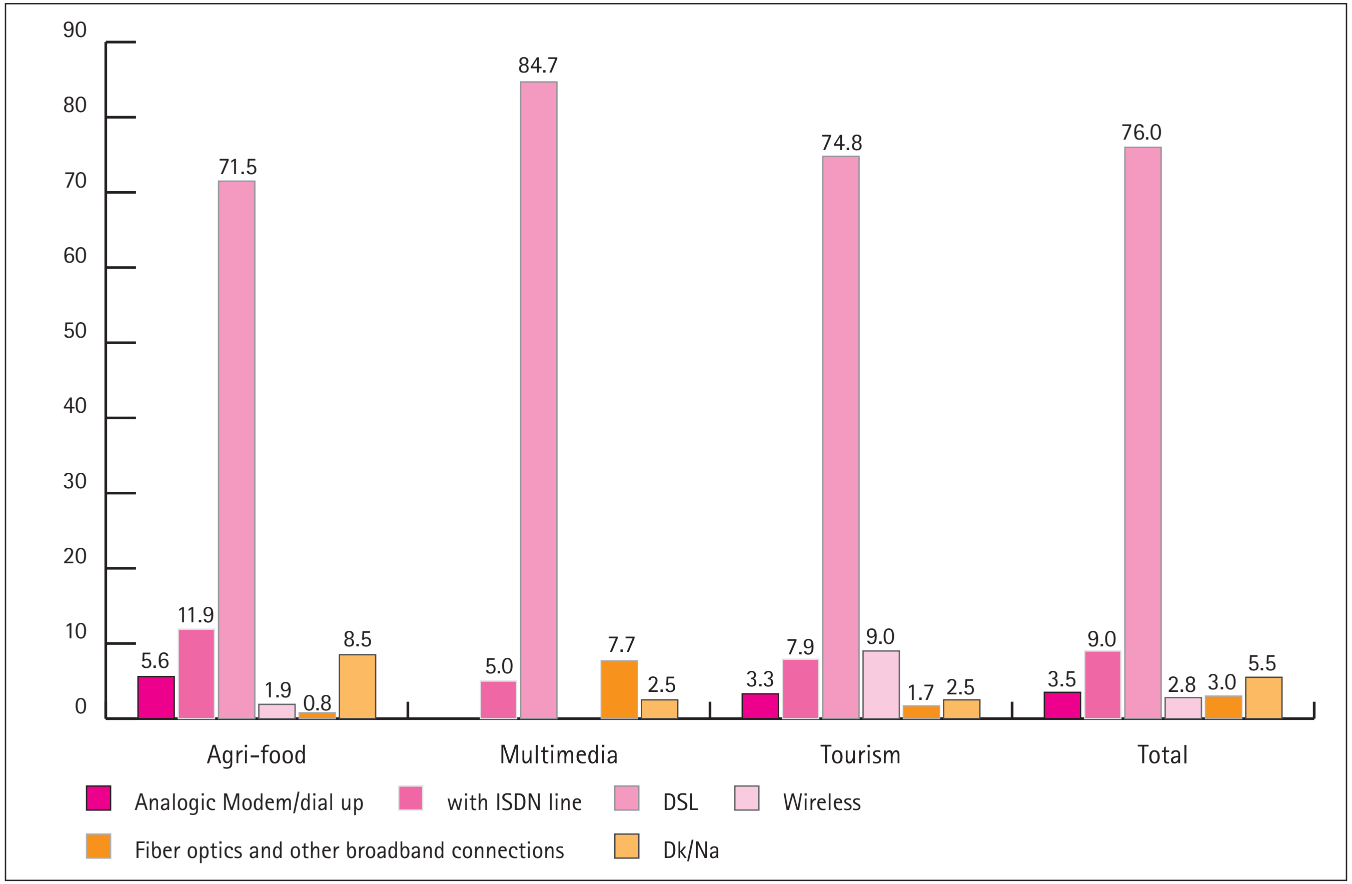

Chart 1 – Technologies for Internet connection used by agri-food, multimedia and tourist companies

systems have been adopted, especially for larger-size companies.
Stock computerization is in fact present in 77% of cases, and 53.8% of companies use ICTs in the management processes of production capacity. In other sectors the percentages are lower. (Stock computerization is present in 38.7% of companies in Multimedia and in 26.2% in Tourism).
As for the integrated management of corporate functions, Enterprise Resource Planning (ERP) systems are reported to be available in 21.9% of companies (in multimedia companies: 16%; in tourism: 7.8%).
Supply Chain Management systems are less widespread than ERP, also due to the small size of the majority of companies (13.4% in Agri-food and 8% in other sectors).
The sectors also stand out for the relevant differences between the number of companies using ICT in a stable manner – mostly composed of large food companies with an international market as reference – and small companies mainly active in local markets, and often using ICT only for stock management.
In the tourist sector, ICT represents an important springboard for market expansion. As is the case for the rest of Europe, online sales "performances" for regional tourist companies are markedly higher than in the other two sectors. The support systems for client management such as Customer Relationship Management are likewise more widespread in this sector than in the other two, although below European levels. The systems are present in particular in 18.9% of companies in tourism, 16.5% in agri-food and 15% in multimedia.
The Multimedia sector also shows an intense in-house utilization of ICT features, such as Intranet and Extranet, and a widespread use of "new" technologies, such as VoIP. The sector also reports a marked ICT use supporting so-called "staff" functions, such as human resources and in-house communication. 90.7% of companies in Multimedia share documents via PC and the Internet (Agri-food: 81.8%; Tourism: 69.4%).
In staff management, 47.3% of companies adopt ICT to manage procedures, such as coupon distribution or displaying the status of staff holidays. ICT systems in timesheet registration are found in 35.2% of companies. (agri-food 27.1% e and tourism 16.9%).
Differently from what we see in Europe, the sector companies do not use ICT intensively in business management and in e-commerce. The sector shows a limited outward opening: in 70% of cases, companies have only local partners, and in 95% they do not have contacts abroad. In the other two sectors, percentages drop to 43.9% and 88.4% for Agri-food, and 48.7% and 87.7% for Tourism.

E-COMMERCE

Emilia-Romagna companies are slowly approaching the practice of purchasing and selling goods and services online.
In Emilia-Romagna almost all tourist companies - as it may be expected – have a website (92.5%), while the

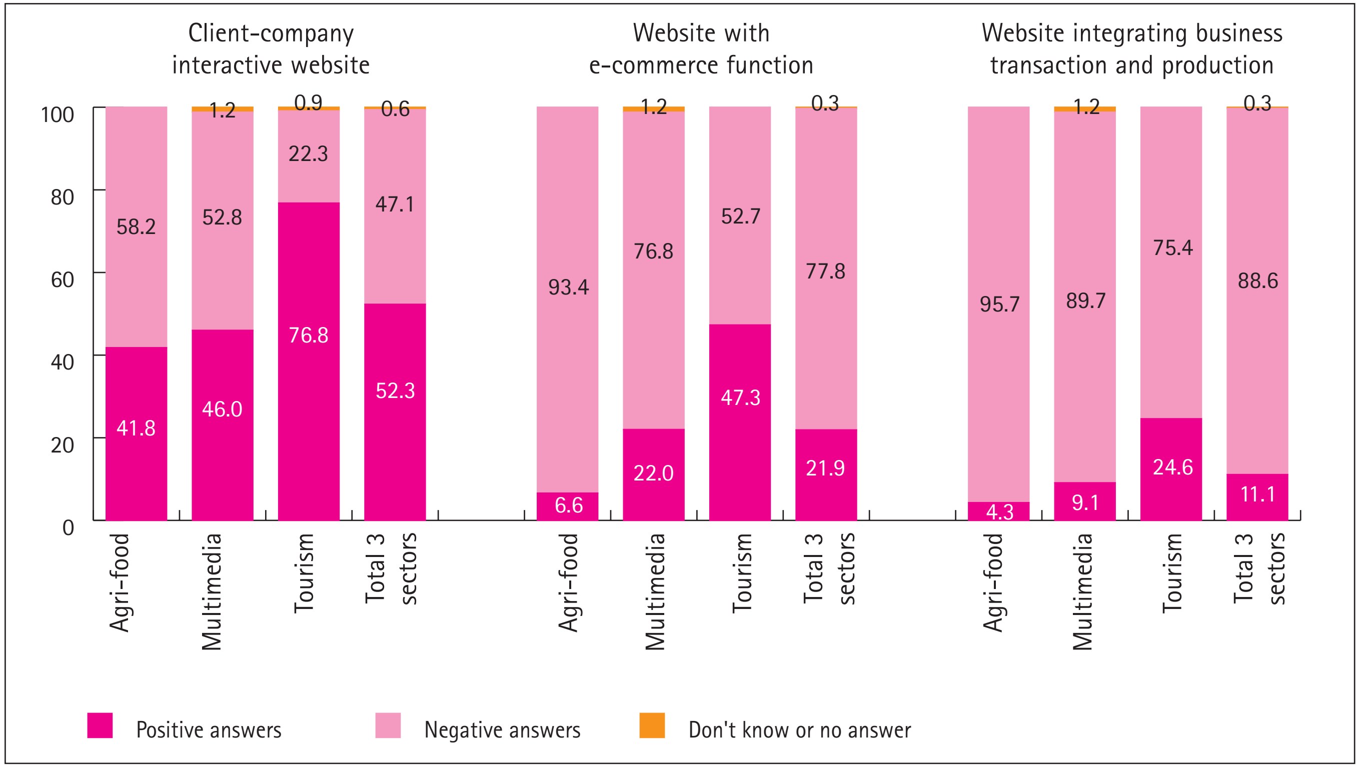

Chart 2 – Percentage of companies with interactive web sites, with e-commerce functions, and integrated with production

figure drops to 72.9% in Multimedia and 66.2% in Agri-food. All companies use it to provide information on their products and services. Tools for customer interaction, such as online catalogues or goods delivery tracking (52.3%) are less present, but still widespread. Functions for true e-commerce are effectively present only in 21.9% of cases, and the integration of this aspect with production functions is even less frequent (11.1%). As it may be expected, tourist companies and large size ones are more dynamic (Chart 2).

ON-LINE SALES

Forty four point four per cent of tourist companies sell products directly online, and of these 27.7% adopt electronic marketplaces. Data drop much further in other sectors (12% in Multimedia and just 3.4% in Agri-food). Sixty three point one per cent of companies selling on the web have however started or stepped-up these activities in the last year, confirming a growing attention to the tool. As regards the volume of online sales, Tourism reports the most relevant data. For 61.5% of companies in the sector, which sell online, the turnover share from e-commerce already exceeds 5% of the entire business. This is reported much less in Multimedia (21.1%) and Agri-food (16%). Finally, the choice of selling goods and products online does not seem to be influenced by the size of companies.
With the exception of Tourism, in Emilia Romagna, as well as for the rest of the country, e-commerce is still a marginal sales channel. The national average is still at 3.8%, and in the last 10 years the growth rate of companies adopting e-commerce has been stable at 10% (Chart 3).

ONLINE PURCHASING

If Emilia-Romagna companies, with the exception of tourist ones, sell very little online, they are reported to be more then willing to use the Internet to make purchases. 35.2% have started or expanded in this direction in the last year, although the percentage varies substantially from companies in Tourism and Multimedia (44.4% and 42%) on the one hand, and Agri-food (27%) on the other. For all the sectors, however, the volume of online purchases never exceeds 5% of overall purchases made in the last year. As regards the "places" where buying takes place, almost always (82.4%) they are suppliers' websites. Processes of integration with their IT systems (27.2%) or the recourse to electronic marketplaces (13.2%) are even less frequent.

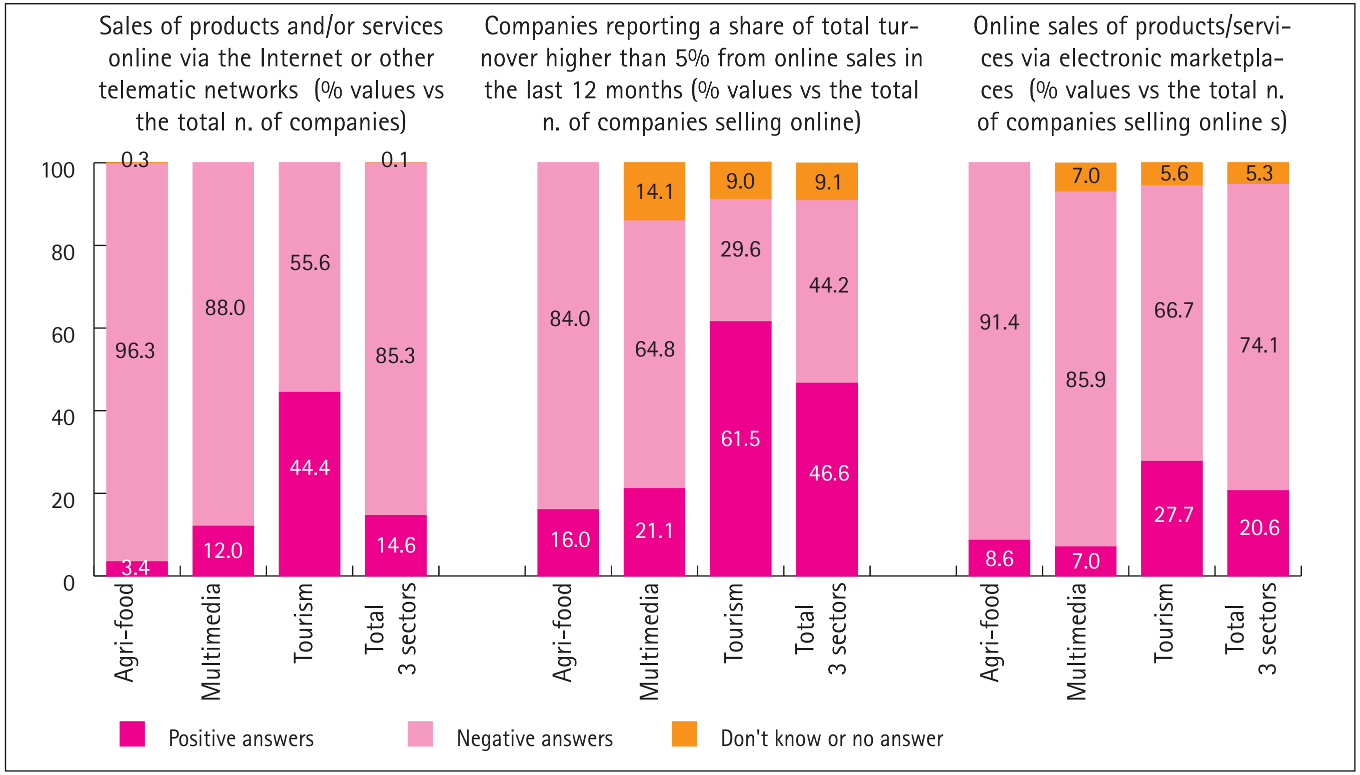

Chart 3 – Percentage of companies selling online via the Internet or other telematic networks, with turnover shares exceeding 5%, and selling products and services on electronic marketplaces in Agri-food, Multimedia and Tourist sectors

ONLINE INVOICING AND PAYMENT

ICT systems are increasingly adopted by companies to process invoicing in electronic format (34.1%). Half of these companies have also initiated or expanded this practice in the last year, and presumably this trend will expand in the near future. E-invoices are mostly used by agri-food companies (38.1%; Multimedia: 31.1%; Tourism: 28.7%). Home banking, which is quite widespread, is used by 83.1% of Emilia-Romagna companies; it is used for example to display online account statement or to make payments and bank drafts online (Agri-food 90.5%; Multimedia 84.9%; Tourism 63.4%).

ICT IN COMPANIES' CONTACTS WITH PUBLIC ADMINISTRATION (PA)

In the last 12 months, 63.7% of companies have used the web to contact PAs. The majority have reported this mode of contact as quite satisfactory, and this is especially true for tourist companies, although they are the ones which have used the web channel less to interact with the public sector. Eighty seven per cent of companies have accessed institutional websites to search for information, and almost the same percentage (86.6%) have also downloaded forms. Around 80% of agri-food and multimedia companies have also forwarded forms, while this was reported only by 63.9% of tourist companies. The practice of online payment, carried out by 53.2% of companies in the last year, is less common but still relevant.

In this case, however, there are relevant differences between the sectors, with the highest peaks in Multimedia (60.5%), with mid-level figures in Agri-food (53.6%), and markedly lower volumes in Tourism (37.5%). (Chart 4) The same differences are reported in the use of specific e-government services. Online income statement filing is for example a practice found in 60.7% of companies in agri-food, 49.5% in multimedia and 33.6% in tourism. In general, the following are less frequent: request for online certification (40% the overall figure), request for authorization/permit, and applications for funding (both around 28%). In exploring the reasons why e-government services are scarcely used, the preference for face-to-face contacts has emerged as the most relevant, as explicitly stated by half of tourist companies (49.6%), and by 30% of companies in other sectors. Also, 15% of companies report the impossibility to complete online procedures, especially in agri-food and tourist companies (18% and 20%), and the lack of online services of real relevance for them.

DISSEMINATION AND USE OF OPEN SOURCE SOFTWARE IN COMPANIES

Twenty one per cent of Emilia-Romagna companies use open source solutions, with peaks of 31.7% in Multimedia and markedly lower percentages in Tourism (19.6%) and Agri-food (15.3%). The adoption of solutions of this kind seems to grow together with the company size. Of the most common open source tools, let us mention here the office automation systems, adopted by 73.1% of companies using open source. Free protection and security software is quite widespread (44% of open-source users), as well as web servers (41.2%) and e-mail clients (32.7%). More in general, although still remaining a choice made by a minority of companies, open source seems to have a relevant impact where it has been adopted. Its growth and penetration potential seems therefore quite relevant.

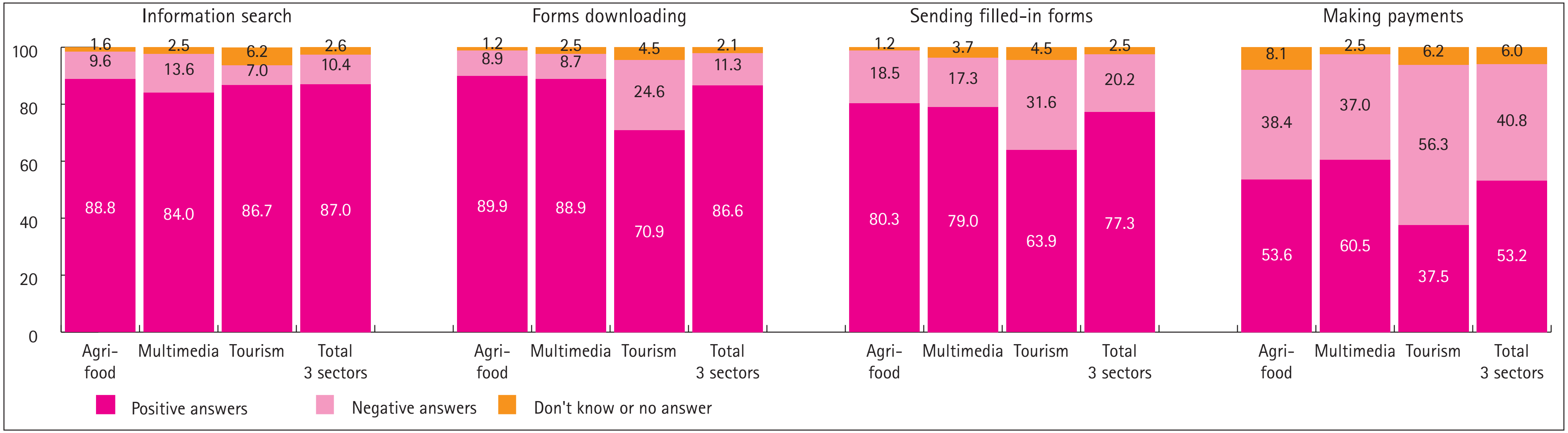

Chart 4 – Percentage of companies having searched for information, downloaded and/or sent filled-in forms, and made payments online on PA websites during the last 12 months

BARRIERS TO THE ADOPTION OF ICT TOOLS AND APPLICATIONS IN COMPANIES

The adoption of ICT in companies is hampered mostly by aspects linked to the management of human resources, starting from employees' training, reported as a barrier by 45% of respondents. The recruitment of staff with ICT skills has instead been reported by ca. one third of multimedia and tourist companies, while in agri-food what counts is the steep cost of technologies (40.4%). The long implementation time needed for ICT solutions is "felt" less as a problem, although still worthy of attention.

In general, Emilia-Romagna companies do not seem to exploit fully the potential of technologies supporting corporate business. They are fully aware that ICT provides for an increased overall efficiency, as reported by 67.1% of answers referring to the areas of impact of technologies in the companies, but they rarely identify the items and/or specific ways to make this possible. Of the functions most commonly mentioned by respondents, 61.6% of companies point at the reduction of administrative expenses, while 54.3% refer to returns in terms of in-house communication. Their introduction does not seem to onset quantifiable overall improvements at company level from the start, while showing to be a sort of facilitator for individual processes.

There is therefore the impression that, although companies do invest in hardware and software, only rarely do the investments made seem to be "driven" by organizational changes enabling to fully tap advantages and opportunities provided by technological advancement. However, investment of this kind would be much more relevant than those needed for technology acquisition. Another problem area is linked to the fact that at present ICT utilization in companies is still seen more as a functional element for management, than a strategic function, as shown by the fact that the majority of staff working in ICT services have got mostly a technical training background. Thus, training and coaching of companies in processes of technology introduction are shown to be fundamental components, if we want them to be considered not solely tools for operational support, but rather and mostly essential leverages, increasing companies' competitive edge.

ICT EQUIPMENT AND UTILIZATION IN TOURIST COMPANIES IN 2004, 2005 AND 2007: TREND ANALYSIS

The regional benchmarking analysis we have already carried out has taken into consideration only the tourist sector. Therefore this is the only sector we can dynamically analyse in terms of ICT dissemination and use. The results show a sector undergoing a positive trend, especially in the areas considered crucial for growth, such as the enlargement of markets and the disintermediation between customers and tourist company. As it may be expected, these areas have seen the consolidation of basic infrastructures.

In detail, from 2004 to 2007, the percentage of tourist companies equipped with broadband connection almost doubled (from 38% to 73%) and a sharp increase was reported also in the dissemination of wireless LAN (from 24% to 48%).

There is also a reported dissemination in the adoption of ICT systems supporting specific corporate functions, with interesting peaks referring to demand and sales forecast (+20%), the management of production capacity (+12%) and, consistently with sector activities, integrated management systems, such as CRM, shifting from 10% to 19% in terms of penetration.

The focus on customers comes however quite "naturally" in the tourist sector, and it is mirrored also in the higher propensity to sell online, in terms of volumes, (from 33% to 44%). Although in the presence of this rise, only 27% of companies sell online more than 5% of their overall turnover. Also the percentage of companies purchasing online is on the rise (from 22% to 44%), but in this case the percentage of companies making only purchases exceeding 5% of total buying is markedly irrelevant with respect to the figures reported for sales (9%) (Chart 5).

As for e-government, a plus 20% of accesses to PA websites has been reported, but in general only 47% of companies adopt this channel. The use of specific e-government services has also not changed: tourist companies tend to look for information in PA websites, but seem not too keen to step onto the interactivity level (Chart 6).

ICT AND INTERNET PRESENCE IN EMILIA-ROMAGNA IN TERMS OF HOUSEHOLDS AND CITIZENS

Results concerning these specific items have been extrapolated from Istat (Italian National Institute of Statistics) sources and derived from Multiscopo survey - ICT module – carried out in February 2006. The survey, which is representative at regional level, has seen the participation of 2,563 individuals of different age, grouped in 1,091 households in the region, who were interviewed either face-to-face or through a questionnaire set up by ISTAT.

Availability of ICT goods in Emilia-Romagna households

In Emilia-Romagna, PCs are present in slightly less than half of the households (47%), while Internet connection is found in 38%. In 10% of households a PC is therefore available, although without Internet connection. Broadband is still scarce. And not solely that: still lack-

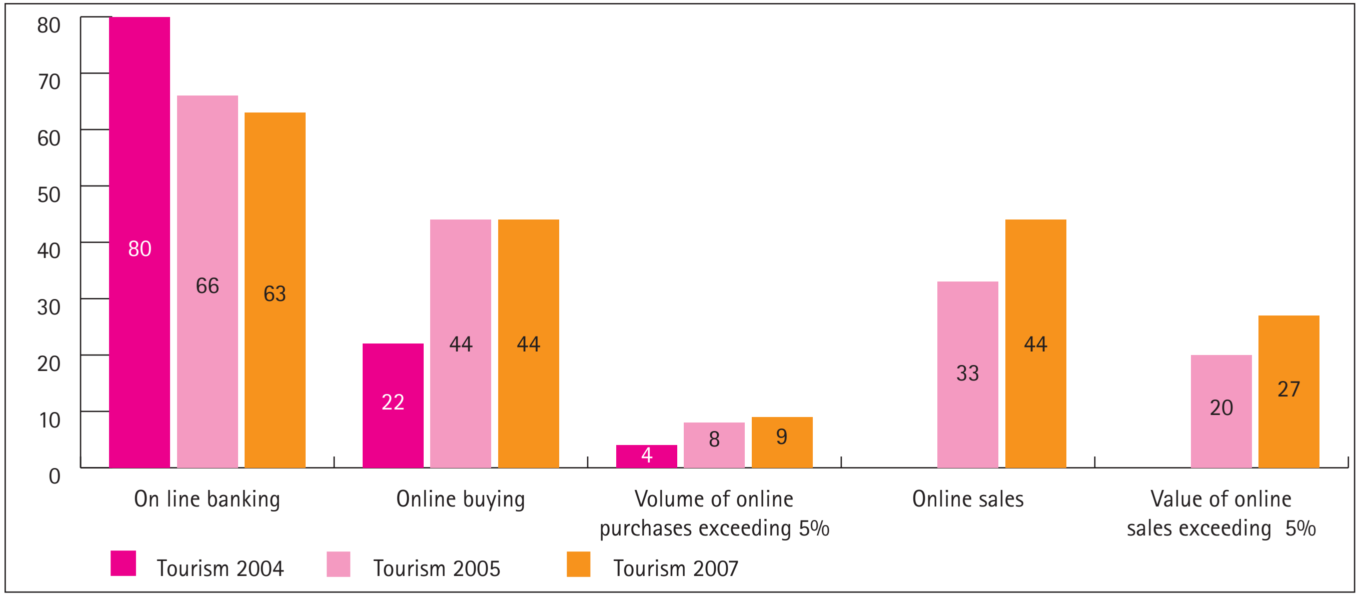

Chart 5 – Percentage of tourist companies using online banking systems, buying and selling online in 2004, 2005, 2007 in Emilia-Romagna

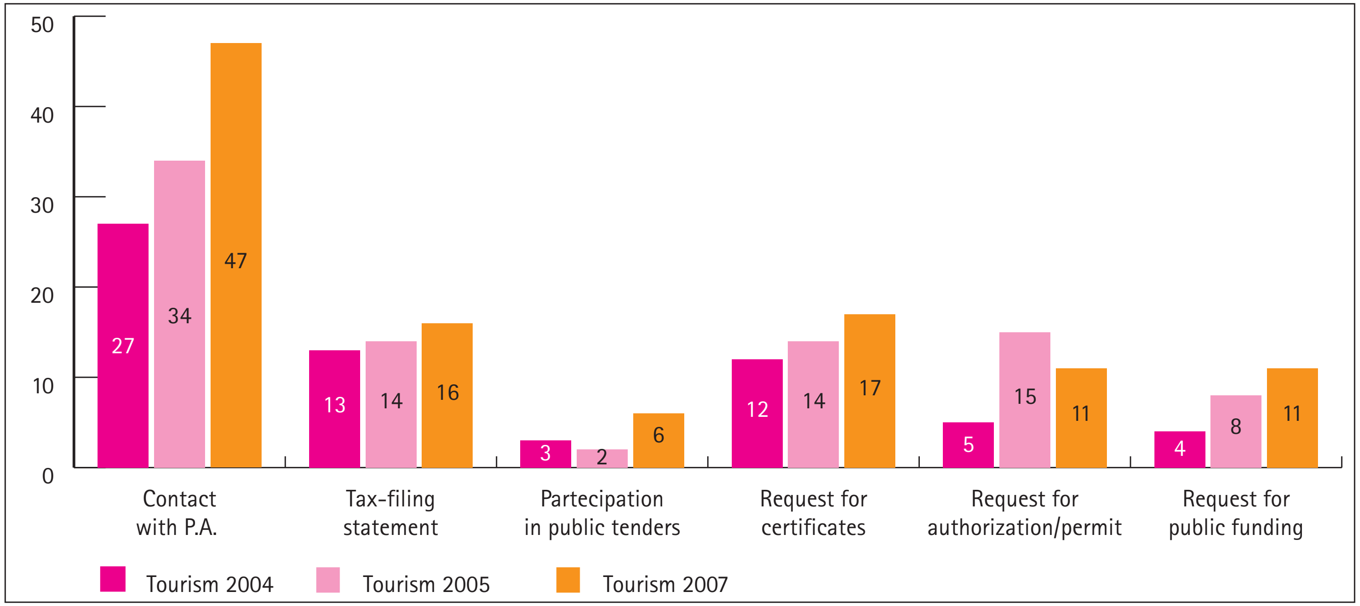

Chart 6 – Percentage of tourist companies having contacts with PA in the last 12 months via the Internet, and type of online services used in 2004, 2005, 2007 in Emilia-Romagna

ing in more than half of households with connection, its dissemination rate is also quite slow.

The analysis of the "divide", namely the disparity of access and use of new technologies in different social groups, has highlighted the generational gap: just 4% of households composed of only elderly people (65 and above) have a PC, and only 2% the Internet connection. Figures increase to 73% and 56%, respectively, if we consider households with at least one minor. Younger generations are therefore the main users of new technologies, and a potential drive for other family members, in terms of IT literacy transfer.

At geographical level, the research has reported a higher propensity in PC use and Internet connection in households in the centre or in the metropolitan area of Bologna. In other large Municipalities, the levels are essentially similar to regional averages. However, at least half of connections are in broadband, while for Municipalities with less than 10,000 inhabitants penetration of this technology ranges around 30%.

Lack of interest and skills (or perceived lack) are the main reasons why households do not equip themselves with IT and connections. In 46% of cases, the Internet is considered useless or not interesting, while in 30% the lack of skills for Internet surfing is reported as a reason. 12% of households do not have the Internet at home, as family members can access it elsewhere. Only few of them, less than 5%, report the high cost of computers and/or connection services as reasons. The divide is therefore the result of socio-cultural more than economic motivations.

In comparing Emilia-Romagna with the national situation, slightly higher percentages of IT equipment are reported for the former, with respect to the overall figures, and a substantial compliance with values from Centre-North Italy (Chart 7).

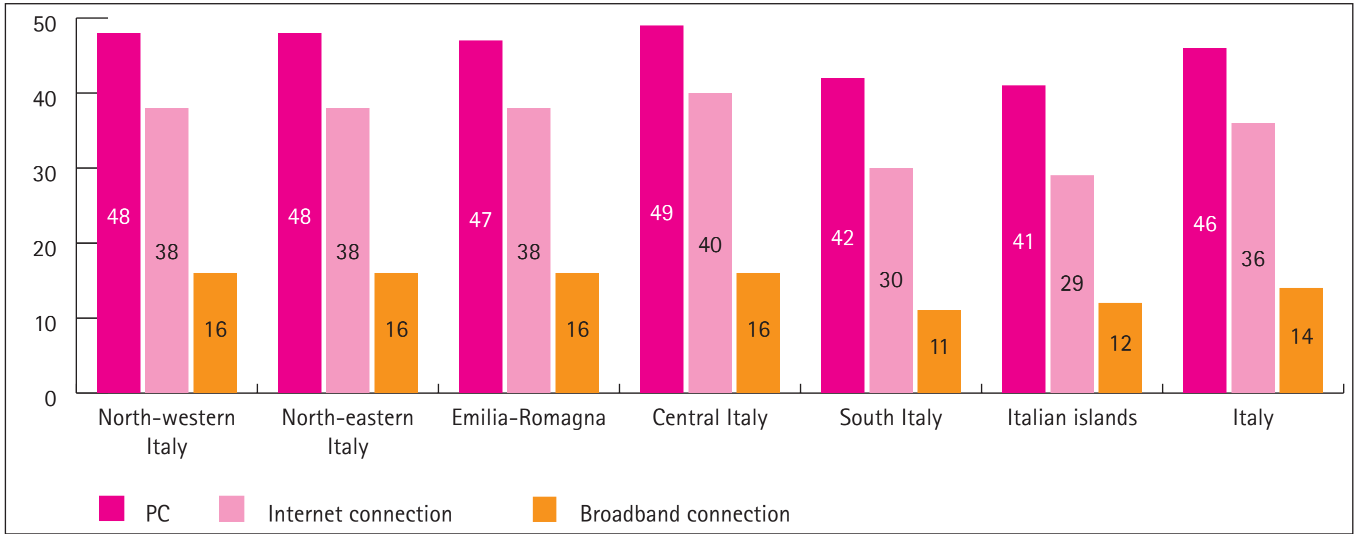

Chart 7 – Percentage of households with PC, Internet connection, broadband connection, with respect to geographical distribution

ICT use by Emilia-Romagna citizens

Personal Computer and Internet use. Forty-five per cent of people in Emilia-Romagna – with more than 3 years of age - use PC, and 38% of people older than 6 have access to the Internet. In both cases, this is reported quite regularly: daily PC users represent slightly more than half of total users, while weekly users represent 88%; as for Internet users, percentages are stable at just below 50% (daily frequency) and 82% (weekly frequency).

The cross-sectional analysis of indicators outlining the profile of Internet users in the region has highlighted that surfers are mostly males, in absolute value, are under 35 years of age and have a high level of education. The gender-based digital divide is marked, starting from the 30-35 age group, while the use of the net is really widespread in the 16-to-24 age group.

At geographical level, there is a higher propensity to net surfing in Bologna and its related metropolitan area (Table 1).

If we consider people who do not access the Net, what is striking is the fact that 26% of them have a connection available at home. In most cases, these are parents whose children surf the net, or instead children and teens whose parents are web browsers.

Finally, the national comparison: once again Emilia-Romagna is reporting figures above the national average (+4%), and in line with other centre-north regions.

Activities performed in the Internet. In Emilia-Romagna the web is mainly used to communicate and search for information, while less for playing or cultural entertainment, and even less for the purchasing of goods and services.

As regards communication and search for information, the leadership of e-mail is confirmed: in the last 3 months, 80% of surfers from Emilia-Romagna have sent and received e-mails, while at the moment more innovative technologies such as VoIP and teleconferencing are less common (used by 8% of Internet users). The analysis has highlighted relevant differences both in terms of age and gender. Instant messaging and chats are quite widespread in the 16-to-24 age groups, e-mail is the most used tool for the over-25; the above-mentioned forms of communication are used mostly by men. Women are reported to be more interested in the search for information, activities which they carry out more extensively than men with respect to health-related issues.

For the 25-to-44 age group, the web often means travel, at least with respect to information activities concerning itineraries and accommodation. In Emilia-Romagna the web is used for leisure time activities, mainly concerning reading and downloading of newspapers and magazines, online games and the download of games, pictures and music, especially for the under-24 and males.

Job seeking and vocational training instead involve adults who consider the web also a useful tool for professional growth, for lifelong learning.

Practices of e-commerce and home-banking are still uncommon, and if they are found, only in the "adult-male" connotation. 26% of web users have in fact ordered or purchased something online at least once, but only 14% did so in the 3 months before the survey. In Emilia-Romagna e-commerce remains therefore a sporadic practice, as for the rest of the country. At this regard, people in Emilia-Romagna declare their preference for "traditional" shopping (53%), and do not consider the Internet necessary for buying (41%). Concerns for data security are less present, although mentioned, as well as the fear that ordered goods are not delivered,

Table 1 – Profile of Internet users in Emilia-Romagna

	Socio-demografic group	Percentage of Internet users within each socio-demographic group (average of Internet users/population total: 38%)
Gender	Men	43%
	Women	33%
Age	6 to 15	44%
	16 to 24	76%
	25 to 44	58%
	45 to 64	34%
	Over 64	2%
Education	Primary school or no formal education	8%
	Secondary school	35%
	Diploma	62%
	University degree	79%
Employment (only over 15)	Student	92%
	Job seeking	45%
	Employed	56%
	• employed as: manager; self-employed as: entrepreneur, professional	71%
	• employed as: manager, middle manager, clerk	81%
	• employed as: worker, apprentice, family worker	28%
	• self-employed as: entrepreneur, cooperative member, helper	43%
	Housewife or retiree	7%
Type of Municipality of residence	Municipality of Bologna	53%
	Municipalities in the outskirts of Bologna	45%
	Municipalities with more than 50,000 inhabitants (with the exception of the municipality of Bologna and municipalities near Bologna)	39%
	Municipalities with a number of inhabitants ranging between 10,000 and 50,000 (with the exception of municipalities near Bologna)	32%
	Municipalities with less and 10,000 inhabitants (with the exception of municipalities near Bologna)	36%

and the lack of tools or technologies, as they are reported by only 10% of surfers. Instead, 46% of people who made purchases online in the year before the survey have reported some problems: e-commerce would not become widespread, if frequent mishaps are encountered by browsers (Chart 8).

Contacts with Public Administration via the Internet. In the 3 months before the interview, 39% of regional surfers visited PA websites to search for information and/or to download and forward forms. About 570,000 people from Emilia-Romagna, equal to 14% of overall population, have therefore had contacts with PA via the Internet, although mainly for information retrieval, however, with an increased recourse to form downloading. The limited propensity for interactivity is reported both for institutional websites and private organizations, and it is mainly due to general attitudes toward the web per se. At the same time, a potential and relevant demand for e-government services seems to emerge. Many surfers do not yet browse the institution-

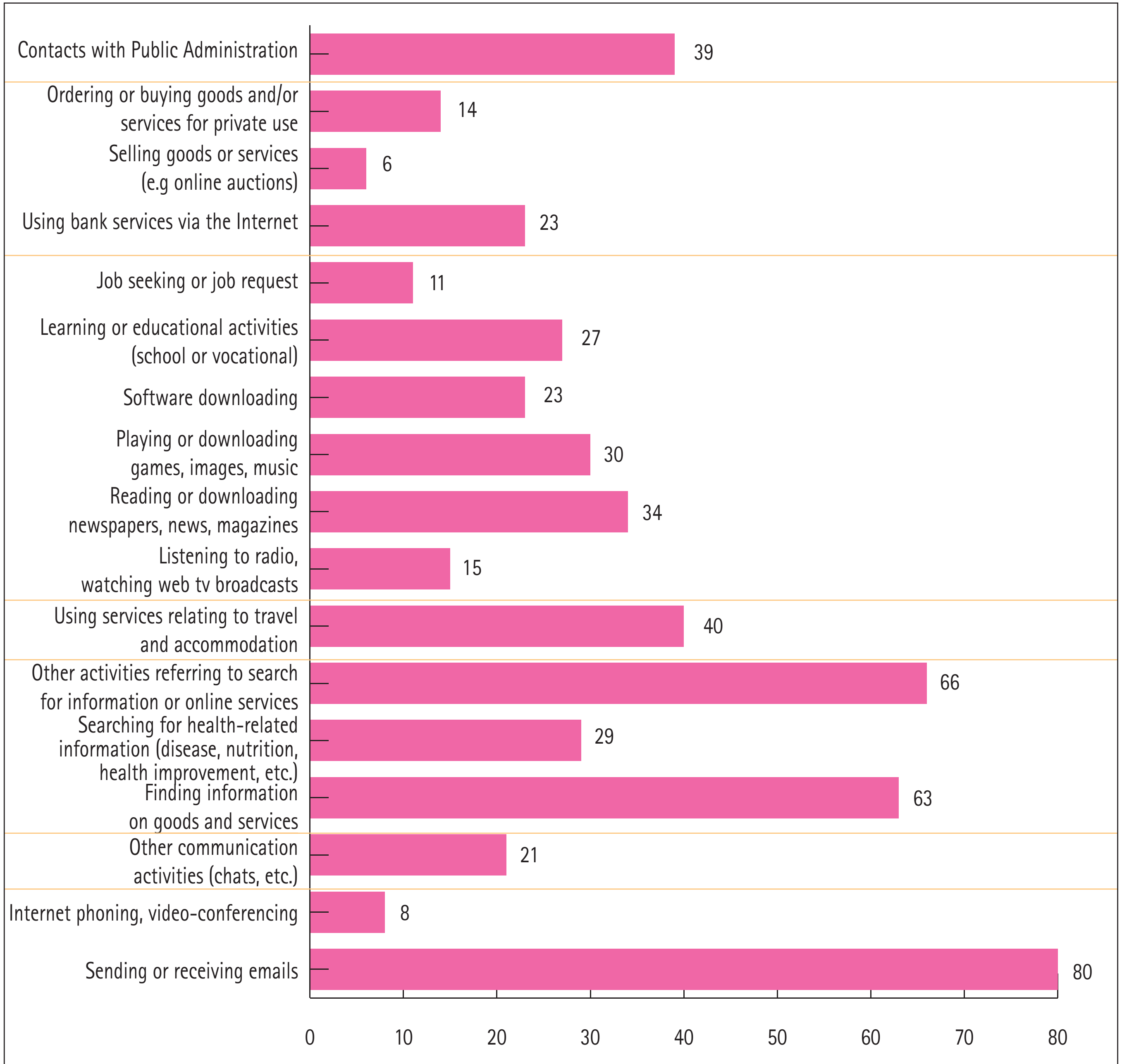

Chart 8 – Percentage of people having carried out specific activities on the Internet in the last 3 months (vs Internet users in the last 3 months)

al websites, although they say they would be interested in using services which are not too complex, and for which personal contacts are less necessary. Services such as record registry (request and sending of personal records and documents), or booking of medical controls and admissions, and library services seem to have found a potentially relevant catchment basin.

As regards the reasons why e-government is still rejected, here the remarks concerning e-commerce do apply: 55% of surfers from Emilia-Romagna still prefer face-to-face contact modes. Complexity of usage, although less hampering, is still quite present and worthy of increased attention in view of an e-government expansion, together with the non availability or access difficulty of the services, and alongside concerns for personal data protection and security (15% of answers of this kind for each factor).

IT skills. Thirteen per cent of PC users from Emilia-Romagna fall within the category of expert users, namely capable of performing at least 10 out of the 12 operations listed in Table 2.

Males are on average "expert users", more than females, although the difference is not particularly relevant. Much more significant is instead the generational gap, progressively increasing with age, between young people (16-to-24) and older age groups.

Acquired skills and abilities have almost always been the result of informal learning processes, from direct use (79% for PC and the Internet), the help of colleagues, relatives and friends (62% and 64%), individual learning (38% and 37%). School and university education have contributed much less (32% and 24%). These are particularly relevant data, especially if we consider that in many households people do not use the PC and/or access the Internet, but, in order to do so, they could

Table 2 – Percentage of PC users capable of performing specific operations pertaining to PC use – Percentage of Internet surfers capable of performing specific Internet operations pertaining to Internet use

IT skills referring to PC use	
Connect and install peripherals	60%
Copy or move a file or directory/folder	81%
Use of "cut and paste" to copy or move information inside a document	83%
Use of basic mathematic formulas in electronic spreadsheets	57%
Compress files	44%
Write a PC program by using a programming language	15%
IT skills referring to Internet use	
Use of a search engine	95%
Send e-mail with attachments	88%
Send messages to chats, newsgroups and forums	47%
Make telephone calls via the Internet	21%
Use "file sharing" to exchange films, music, etc.	25%
Create a web page	16%

take advantage of the mechanism of informal skill transfer from relatives and experts (Table 2).

European comparison

In order to make comparison with other countries possible, the exercise, which has taken into consideration Eurostat sources, has focused – as regards technological equipment at home – only on households with at least one member aged 16-to-74. The same age group remains the only survey base for data on individual IT utilization.

According to collected data, in Italy and in Emilia-Romagna, the Internet penetration rate in households is lower than in Western Europe (43% for Emilia-Romagna and 51% for Europe-25). Italy is in line with France, Spain, Portugal and Baltic Republics, quite below Northern European countries, and better placed with respect to Eastern Europe. Our divide worsens if we consider broadband connection (44% of households with an Internet connection in Emilia-Romagna, in comparison with the European percentage of 63%). At this regard, countries culturally closer to us, such as France and Spain, report markedly higher penetration rates, around 75%.

If we analyse Internet users, representing 43% in Emilia-Romagna, the percentage rises to 56% in the European Union at 25. With respect to this figure, Italy and Emilia-Romagna are placed last in Europe, preceded even by Eastern European countries which have just recently joined the Union.

If we look at the e-commerce, this activity is quite widespread in Northern Europe, where around 50% of surfers buy online. In Italy and in Emilia-Romagna, the percentage plunges instead below 25%, at the same level than East Europe's.

As regards e-government, instead, the situation is much more positive. In Italy, Internet use to communicate with PA is reported at 44% of Internet users, just 3 percentage points below the European average (47%). If we consider instead the whole population, in some northern European countries around 50% of citizens 16-to-74 have online contacts with PA, while in Italy the figure stays well below 20% (Chart 9).

BROADBAND DISSEMINATION IN EMILIA-ROMAGNA

The present section intends describing the availability of broadband infrastructures and the supply of said services in Emilia-Romagna in the period December 2006/ March 2007 for the general population, companies and public administration. Special attention has been paid to the issue of geographical digital divide, with indications on the scope of the phenomenon and its components. In conclusion we present actions planned by the Region to tackle the problem.

Fiber optics infrastructures for backbone and MAN in the region

In Emilia-Romagna there is a very high fiber optics presence used for territorial BACKBONE and MAN. Thus, the Region plays a strategic role at infrastructural and telematic level, as confirmed by the high number of operators involved. Bologna is again reported as the strategic node of regional activities, with a fiber optics density and a number of operators higher than in other provinces.

Lepida: private broadband network of Public Administrations in Emilia-Romagna

With the Regional Telematic Plans for 2002-2005 and 2007-2009, Emilia-Romagna Region has designed and initiated the implementation of Lepida, a private telecommunication infrastructure mainly using fibre optics. Once completed, the network will link offices and facilities of the Region, 341 Municipalities, 10 Provinces, 18 Mountain Communities, 5 Universities, 11 Health Boards and 6 Hospital Trusts operating in the regional territory. This will enable high-speed connection for more than 120 thousand public employees, the provision of online interactive services to citizens and companies, and the streamlining of administrative work.

The creation of Lepida started in 2003 and is now well advanced. Installation has followed geographical apportionment, with implementation carried out by local Multi-utility companies, which have been assigned by the Region to also provide for network management services. The network construction has been laid out in three stages, not necessarily one after the other. The first stage concerns geographical infrastructures; the second, concerning urban-scale strengthening, envisages the setting up of metropolitan networks (MAN) and the development of network nodes in all the headquarters of Local Authorities, Universities, Health Boards and Hospital Trusts, many schools and regional decentralized offices. The third phase aims at using fiber optics installed by Multi-utilities as an addition to Lepida in order to bridge the "digital divide".

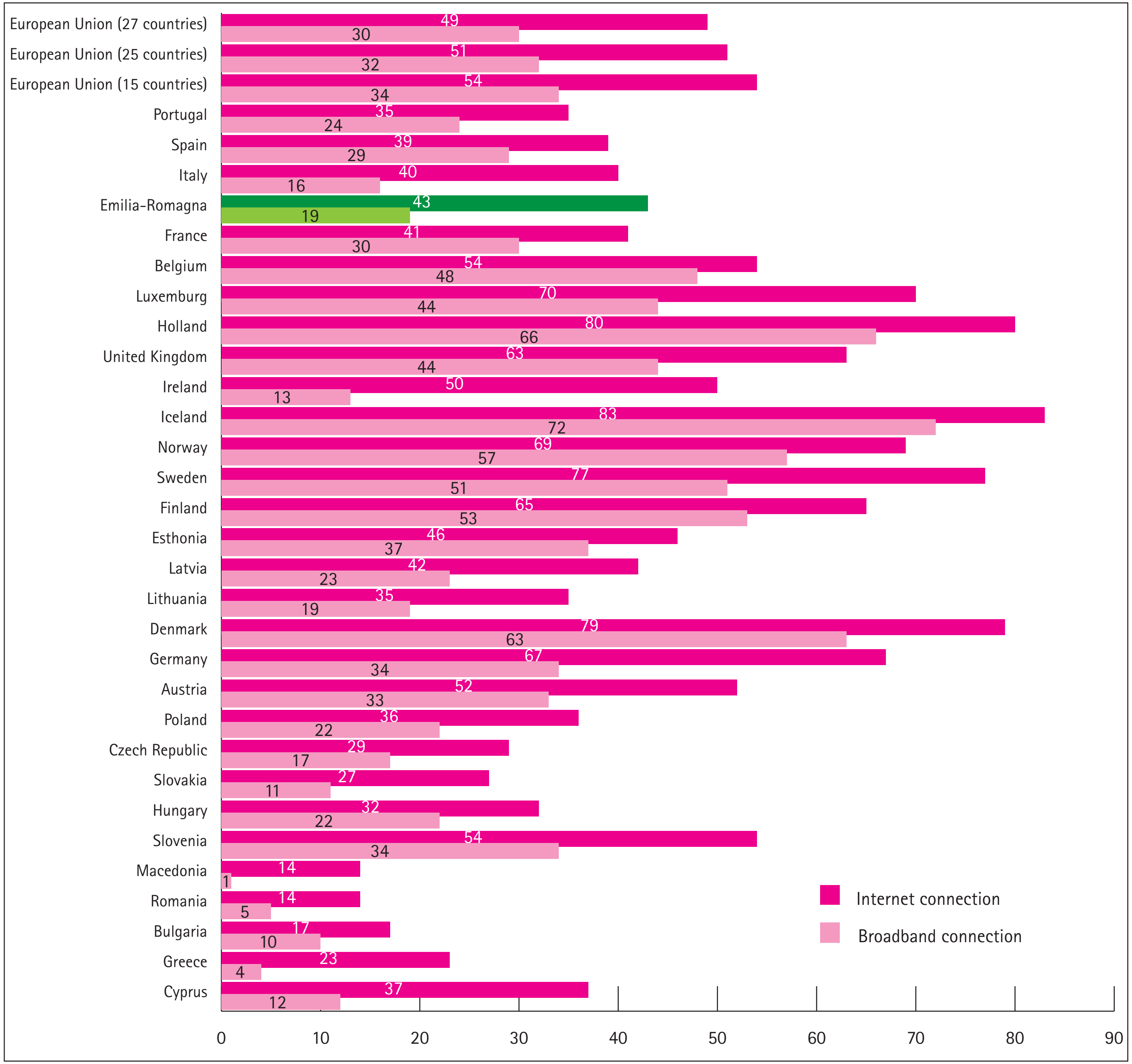

Chart 9 – Percentage of households (with at least one 16-to-74 year-old member) with an Internet connection and a broadband connection

In 2007, 289 out of 341 Municipalities and other 122 Public Administrations were reported to be connected with Lepida for a total of 411 institutions. As for the geographical network, at the moment, fiber optics, HDSL, satellite and WI-FI have been used. Since 2006 several projects have been activated for MAN implementation, the first of which refers to the metropolitan network of Bologna.

Supply of broadband services in Emilia-Romagna

As regards the supply of broadband services in Emilia-Romagna, we have used data collected in December 2006 by the broadband Observatory – Between – according to the Understand methodology. In late 2006, the supply of ADSL services to citizens, companies and Public Administrations was high and above national and northeast figures (Table 4).

In detail, around 92% of population could access ADSL services (89%, national average), while the percentage has settled at 54%, with respect to ULL (Unbundled Local Loop) Technologies, and 55% for the access to high-speed connections, such as ADSL2+. At territorial level significant differences have been reported: if in fact in 148 Municipalities, where 77% of regional population live, broadband coverage is essentially complete, there are still 61 Municipalities, accounting for 3% of population, where broadband is not present. More in general, whenever population density is lower, in particular in rural areas (although in the last year, a 15% rise was reported), only 60% of the population have access to broadband. In view of these data, Emilia-Romagna is placed well above national and Northeast figures (52% and 59%) (Table 5).

With respect to band speed/width, an important element for the access to advanced services, 55% of the resident population in 50 Municipalities have available speeds above 4Mbit/s. These Municipalities are located along the Emilian road, which represents a full-fledged strategic line. 36% of the population living at the foot of the Apennines and in the plain at the north and residing in 219 Municipalities, may have access to a maximum velocity of 4 Mbp/s. 11 Municipalities are served by MiniDSLAM (640 Kbit/s, on exchanges without fibre optics) and other 61, almost all located in mountain areas, experience an almost complete digital divide. Differences are relevant also between provinces, with Rimini and Bologna almost entirely covered by ADSL (97% and 95% of reached population have access to these services), and Ferrara lagging behind (83%). Figures are essentially identical for companies, which however are covered by HDSL in 99% of cases, without substantial differences between provinces.

Dissemination of mobile technologies in Emilia-Romagna. The use of mobile technologies for the supply of broadband services is rapidly growing all over the regional territory. Entrepreneurs are investing heavily in the consolidation of networks and the supply of value-added services, also in view of a clear rise in the demand for telephone services at national level. Thus, the service supply, which is based on mobile technologies, such as UMTS and HSDPA, is widely disseminated in the regional territory, in line with findings at national level. In 2007, 213 Municipalities, where 90% of the population reside, were covered by UMTS services, although mountain and hilly areas are left behind, with the exception of a few areas in Romagna. In the provinces, there are maximum coverage peaks in Ravenna (97%) and Rimini (95%), with 84% and 83% in Parma and Piacenza. With markedly lower coverage levels, HSDPA, which was launched in 2006, is instead available in 89 Municipalities, where 72% of the regional population reside. This technology is in fact present only in 26% of Municipali-

Table 3 – Distribution of active Lepida connections at provincial level

Provinces	Connected Municipalities	Other connected PAs	Total of connected Authorities
Piacenza	45	3	48
Parma	35	3	38
Reggio Emilia	38	9	47
Modena	46	5	51
Bologna	60	18	78
Ferrara	0	13	13
Ravenna	18	11	29
Forlì-Cesena	30	46	76
Rimini	17	14	31
TOTAL	289	122	411

Table 4 – Percentage of the population having access to ADSL services and 2005-2006 growth rate in Emilia-Romagna, Northeast and Italy

	ADSL Coverage (% Population)	Growth rate 2005-2006
Emilia-Romagna	92%	3%
Northeast	89%	3%
Italy	89%	3%

Table 5 – Number of Municipalities and population percentage in terms of broadband coverage areas

Broadband coverage (> 256 Kbit/s) (% Population)	Municipalities (N.)	Municipal population (%)
Up to 5%	61	3
From 6% to 50%	30	2
From 51% to 75%	28	3
From 76% to 85%	22	4
From 86% to 95%	52	12
Over 95%	148	77
Total	341	100

ties, located mainly along the Emilian road and in the plain in the north. It should also be considered that the demand for advanced services via mobile technologies is still in the state of infancy. In 2006[1], according to ISTAT, around 2% of people in Emilia-Romagna used UMTS cell phones to access the Internet (Table 6).

Competition at infrastructural level and in the supply of broadband services in Emilia-Romagna

Access to broadband services may be influenced by competition between providers in the territory. The presence of line sections in ULL (Unbundled Local Loop), enabling the direct management of line sections by operators competing with the incumbent; Fibre Optics (FO) availability by other operators, and to a lesser extent the supply of services in wholesale mode, are just some of the items providing indications on the level of available technological competition. In general, 54% of the regional population, residing in 44 Municipalities, benefit from a market setting assuring a minimum of technological competition. For the remaining 38% of the population with broadband coverage, competition is instead limited only to the wholesale service. As regards the supply of broadband services to citizens and companies, in December 2006 in the Region 49 operators were active, (+13) with respect to 2005, while the ones with infrastructures were 20, +2 with respect to the previous year. The creation of an environment slightly more open to competition seems confirmed by the minimum drop in the number of subscribers to the incumbent's broadband services, from 72% to 69% between 2005 and 2006. In any case, the incumbent's market value was in late 2006 much higher than the 12% value reported by its closest competitors. In general, competition on fixed infrastructures has developed in the region with difficulties and has focused only on the area following the line of the Emilian road.

Digital divide in Emilia-Romagna

The digital divide is a problem also present in Emilia-Romagna. The lack of access to broadband services, according to Between data, up to December 2006, involved around 270,000 people, equal to 8% of the regional population. Of these, 7% were touched by long-term digital divide (LDD), which refers to areas which are considered not economically viable by market operators, and for which the so-called "market failure" is reported. The population in the provincial areas of Ferrara (14%), Piacenza (12%) and Parma (11%) is touched mostly by the problem, which is much less relevant in the provinces of Rimini and Forlì-Cesena (3% and 4%, respectively) (Chart 10).

Although these figures correspond to national averages, the incidence of long-term digital divide in terms of involved population is no less relevant in Emilia-Romagna than in other densely-populated regions of the north.

Finally, a new form of divide has also been reported, which is called second generation, creating disparity between whoever can benefit from relevant bandwidths, generally supporting ADSL2+ technologies, and whoever is excluded from it, namely 45% of people living in Emilia-Romagna. Forlì-Cesena and Ferrara, with only 41% of citizens capable of accessing ADSL 2-technologies, are again lagging behind, while Rimini, with 69% of people covered by this service, is again reported as the most dynamic area.

Data are open to ambivalent interpretations: if on the one hand they testify of the progressive bridging of the geographical digital divide in the region (mostly made possible by the work carried out on the exchanges), on the other hand they stress how the problem of the long-term geographical digital divide, deriving from a full-

Table 6 – Percentage of population, companies and municipalities with UMTS and HSDPA technologies

UMTS Coverage				
Provincia	Popolazione	Imprese	Comuni	Superficie
Bologna	93%	94%	72%	73%
Ferrara	93%	94%	77%	92
Forlì-Cesena	91%	93%	57%	57%
Modena	88%	88%	57%	54%
Parma	84%	86%	51%	43%
Piacenza	83%	85%	52%	45%
Ravenna	97%	98%	89%	85%
Reggio Emilia	86%	88%	64%	56%
Rimini	95%	96≤	60%	72%
Emilia-Romagna	**90%**	**92%**	**62%**	**63%**

HSDPA Coverage				
Provincia	Popolazione	Imprese	Comuni	Superficie
Bologna	79%	81%	38%	51%
Ferrara	74%	77%	31%	61%
Forlì-Cesena	74%	77%	23%	28%
Modena	73%	75%	30%	37%
Parma	57%	60%	11%	16%
Piacenza	53%	58%	13%	16%
Ravenna	82%	85%	39%	70%
Reggio Emilia	58%	62%	24%	29%
Rimini	88%	90%	40%	55%
Emilia-Romagna	**72%**	**75%**	**26%**	**38%**

[1] ISTAT – Indagine Multiscopo, Aspetti della vita quotidiana, Le tecnologie dell'informazione e della comunicazione: disponibilità nelle famiglie e utilizzo degli individui, anno 2006.

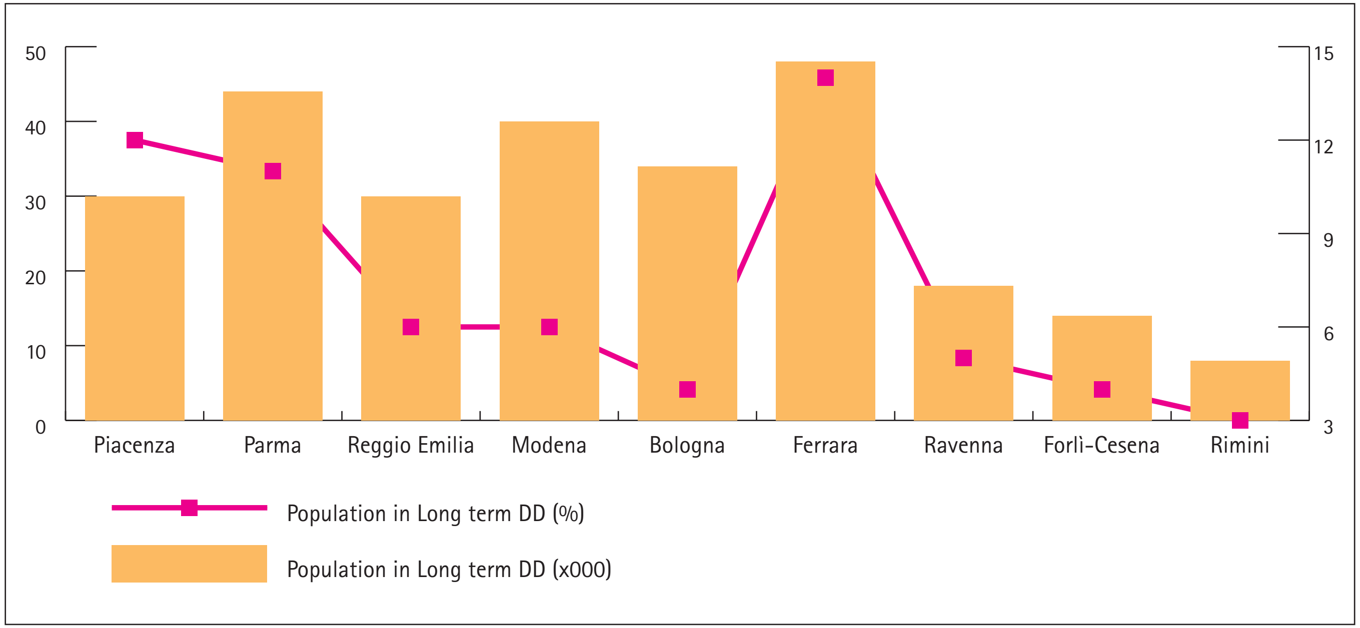

Chart 10 – Population subject to long-term digital divide at provincial level (in % and thousands)

fledged "market failure", is still far from being solved. Furthermore despite there are areas where the problem is more heavily felt, white areas are widespread in the region. Tasks to tackle it seems therefore very complex, as the detection of areas of intervention is much more difficult, as well as the organisation of activities to perform. Finally, the special relevance of second generation divide shows the presence of an infrastructural system having trouble in keeping up with service supply.

ACTIVITIES ENVISAGED BY EMILIA-ROMAGNA REGION FOR DIGITAL DIVIDE REDUCTION

The Region, the Provinces and other local administrations have promoted several actions for the reduction of the digital divide linked to lack of infrastructures for the delivery of ADSL services. In particular with the regional Telematic Plan 2007-2009, the Region has committed itself to the task of making services available to all its citizens with at least a Minimum Level of Communication.

Without intending to replace private operators, initiatives have been carried out for the digital coverage of the territory, by co-ordinating public and final funds, and enhancing infrastructural investments already made by the Region and multi-utility companies with LEPIDA installation.

Specifically, the programme aiming at reducing the digital divide, defined by the Telematic Plan 2007-2009, pursues two objectives:

- by 2008: assuring the supply of commercial broadband services to citizens residing in urban centres and higher housing density areas, and companies "with the divide", located in the main industrial areas of the region: broadband should cover at least 40% of the population and companies;
- by 2009: assuring the availability of commercial broadband services to at least 95% of citizens and companies throughout the region.

In 2007 some activities envisaged by plans saw the starting of the implementation stage in mountain areas in the Reggio Emilia and Parma territory in co-operation with Enia. In the plain area, where Lepida is already active, the lease of fibre optics sections owned by Enìa utilities to Telecom was tested, in exchange for the latter's commitment to fit exchanges with Full-DSLAM. Projects for wireless coverage were started also in the provinces of Modena, Piacenza, Bologna and Rimini, with the participation of multi-utilities HERA and Modena Network and telecom operators.

These activities are complementary to the "Agreement for broadband development between the Ministry of Communication and Emilia-Romagna Region", signed in November 2007, and its provisions, which for the period 2008-2009 planned the implementation of activities in 94 mountain Municipalities (27.5% of total), reporting total or partial digital divide, and were conceived as the main response by Emilia-Romagna Region to the "market failure" which is at the basis of the long-term divide. To this end, euro 19.25 millions will be invested, with around euro 15 millions earmarked by the Ministry, and euro 4.25 million by the Region and local authorities.