



## EXECUTIVE SUMMARY



The present report represents the third volume published by Regione Emilia-Romagna related to the task of benchmarking the digital information society in Emilia-Romagna. Through this activity, the Regione intends to make an initial comparison, via the extraction of specific indicators, with the parameters that have been exposed in the Europe 2002 and 2005 plans.

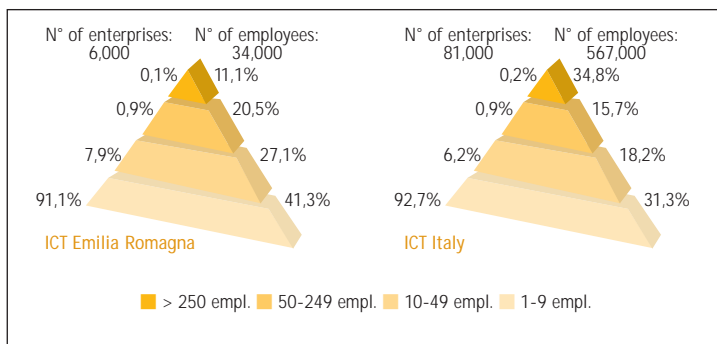
It is a large, ambitious effort that will be subject to constant monitoring and corrections during its course. In fact, at the present time, no data are available at the regional level related to the eEurope indicators, only some regional data at an experimental level, as those provided by Biser.

This summary will show the result of the first survey on the *dimension of the ICT sector* (companies, employees, ICT market), on *the production of local content*, on *ICT training and education*, with a focus on the connectivity infrastructures of *Universities and Research Centers*. It will offer some integrated, common clues to catch the peculiarities of demand/supply of technology, the characteristics and the perspectives of the ICT market of Emilia-Romagna.

### **CHARACTERISTICS OF THE SUPPLY SIDE OF THE ICT MARKET DIMENSION OF THE ICT SECTOR AND PRODUCTION OF LOCAL CONTENT**

A look at the structure of Regione Emilia-Romagna in terms of dimension, employees and compartments can suggest interesting reflections.

Enterprises with employees and employees in the Local Provincial Units, ICT(\*) sec-  
tor, Emilia-Romagna and Italy, 2000 (absolute values and percentages %)



Source: UNIONCAMERE: REA 2000. Elaboration: Assinform/Statistica-UNIMIB.

(\*) ICT: Hardware and Technical Assistance (300,725), Trade Channel (51641, 51642, 52481), Telecommunication Services and Equipment (642, 32202), Software and Services (721, 722, 723, 724, 726).

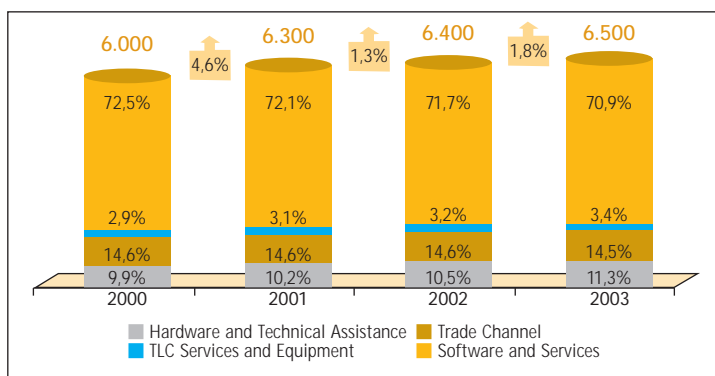
The local provincial units in the region appear to be more relevant than the local provincial units of the enterprises headquartered in Emilia-Romagna. Companies outside Emilia-Romagna make more investments inside Emilia-Romagna compared what local regional companies do outside the region. On one hand, this demonstrates the capability of attracting capitals and investments, but on the other hand, it generally implies a reduced presence in the territory of the headquarters and research centers of large enterprises.

The ICT companies are concentrated in the province of Bologna, which shows the highest growth rate in every compartment except telecommunications, where the highest growth rate belongs to the province of Ferrara (+60%).

**STRUCTURE AND DYNAMICS OF ICT COMPANIES IN EMILIA-ROMAGNA**

Like at the national level, also Emilia-Romagna registered an increment from 2000 to 2003 in the number of ICT companies, which grew from 6,000 to 6,500. The dynamism of ICT applies to all compartments and especially to telecommunications, thanks to well-known effects of the liberalization of the market and to the birth and entry of new alternate operators. Like in the whole of Italy, also in Emilia-Romagna Software and Services companies determine the behavior of the compartment. They represent, in fact, almost 71% of the total, versus about 11% for Hardware and Technical Assistance companies, 15% for Indirect Channels, and only 3% for Telecommunications Equipment and Services companies.

Enterprises with employees in the ICT (\*) sector by compartment, Emilia-Romagna, 2000-2003 (absolute values, variations and percentages)



Sources: UNIONCAMERE: REA 2000, MOVIMPRESE 2000-2003(2 Qtr.). Elaboration: Assinform/Statistica-UNIMIB.

(\*) ICT: Hardware and Technical Assistance (300,725), Trade Channel (51641, 51642, 52481), Telecommunication Services and Equipment (642, 32202), Software and Services (721, 722, 723, 724, 726).

### ICT EMPLOYMENT AND RECRUITMENT IN EMILIA-ROMAGNA

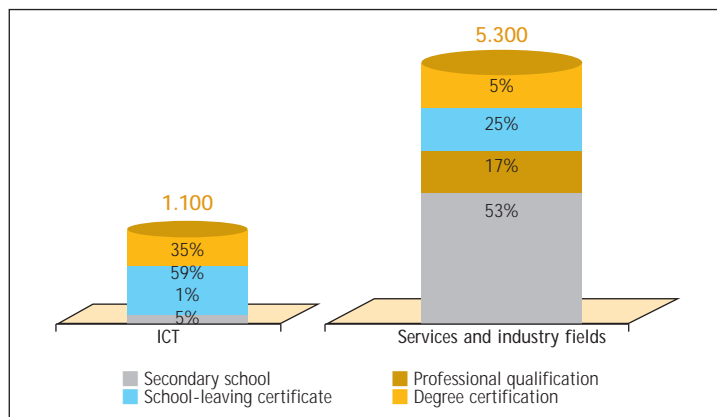
There are almost no large companies or local provincial units in the region and the percentage of microcompanies is lower than that of the small-medium ones. This setup, however, guarantees the level of employment in a period of heavy restructuring of the ICT compartments. Moreover, the distribution pattern of the workforce, (25% independent workers, versus 19% at the national level) gives the region a better chance to adapt its local ICT business to periods of shrinking demand.

Regione Emilia-Romagna, which counts in the Italian economy more for its traditional sectors than for ICT, weighs for almost 10% of the industry and services national employment but only for 6% of the ICT employment. The growth rates of employment in the ICT sector and in the users sector, if observed together, are below those of only three Italian regions. In the last ten years, the ICT employees in Regione Emilia-Romagna grew 22%, a percentage lower than the average (28%), because of a lesser development of the provinces of Ferrara (-0.6%), Bologna (4.9%), Ravenna (6.4%), Forlì-Cesena (13.6%) e Piacenza (22.9%). Only Bologna and Parma are equipped of more employees than the national average, while the other provinces and the Regione as a whole are recording less than 1 employee every 100 inhabitants.

For the year 2003 companies forecast about 1100 hires and 500 discharges, with a positive balance of 600 employees. Analyzing the 2003 hires by level of instruction

required, we observe that the ICT sector requires 94% of the candidates to have a profile with a higher or University degree, versus only 30% for the other economic sectors. The hires in the ICT sector in the region represent 2% of the total hires in the Industry and Services sector.

Forecast of hires in the ICT (\*) sector and in the Industry and Services(\*\*) sector, by level of education, 2003 (absolute values and percentages %)



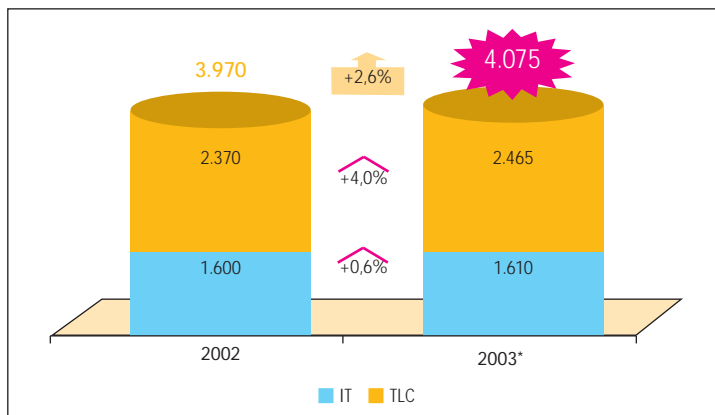
Source: UNIONCAMERE- MINISTERO DEL LAVORO: *Excelsior 2003*. Elaboration: *Assinform/Statistica-UNIMIB*

(\*) ICT: Hardware and Technical Assistance (300,725), Telecommunication Services (642), Software and Services (721, 722, 723, 724, 726).

(\*\*) Industry and Services (-ICT): Mining (C), Manufacturing (D), Production and distribution of electric power, gas and water (E), Building (F), Wholesale and retail commerce; personal and household goods (G), Hotels and Restaurants (H), Transports, warehousing and communications(J), Monetary and financial transactions (I), Real estate, rents, information and research (K).

## THE ICT MARKET

The ICT market, Emilia-Romagna (2002-2003 \*forecast) – values in millions Euro



Source: Assinform/NetConsulting

The analysis of the ICT market in Emilia-Romagna, as it emerges from the above analysis of the region by dimension, employees and compartments, confirms a scenario of small-medium enterprises with the certain characteristics. The supply side is made up mainly of small companies with a radius of activity generally limited to the province and the demand side by customers, which are generally small-medium enterprises mostly in the industrial compartment. The sample survey carried out on the software and services companies further confirms these results.

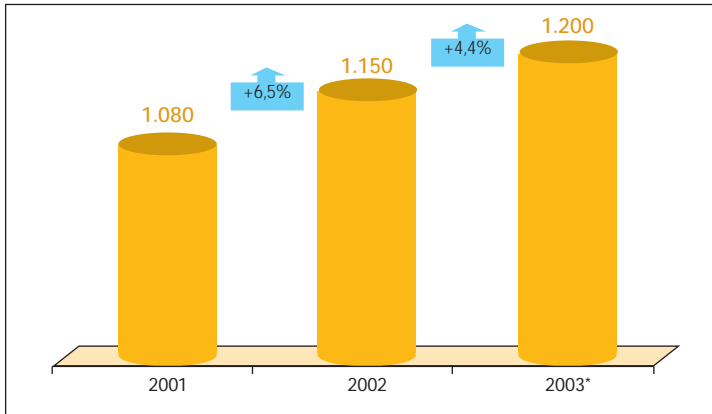
### **SURVEY ON THE MARKET OF CONTENT, SOFTWARE AND SERVICES (CSSI) PRODUCED IN REGIONE EMILIA-ROMAGNA**

The survey on the production of local content dealt with an entity that represents about 28% of the ICT market of Emilia-Romagna, that is, the development and offering of software, services and technological content, with the total exclusion of the hardware and technical assistance compartment and of the telecommunications market.

The sample survey highlighted that the structure of such market segment is highly fragmented and characterized by companies of small size. In this compartment, almost 75% of companies have less than 3 employees while little over 3% have more than 30 employees.

Many of these companies (well over 33%) were born at the time of the "New Economy

Software, Content and IT Services Market, Emilia-Romagna (2001-2003\*forecasts)  
– values in million Euro



Source: Assinform/NetConsulting

boom", that is in 2000-2001, on the stream of enthusiasm that there was at those times about everything related to the Net.

In fact, observing the type of offer of these companies, we find that quite as many as 84% develop web sites, 72% dynamic web sites, 62.3% e-commerce solutions, 58.5% content for web sites and 54% multimedia products.

The origin of such initiatives, strongly unbalanced towards the web, is therefore clear. Still, by looking in more detail into their portfolios, we can detect some *signs of evolution* that mark the companies belonging to this segment.

These signals are pointing in the direction of a strong widening of the offer of product and services, where the sales of management applications and Business Intelligence solutions reveal a higher profile approach to the market. We see a picture in which companies over time have strengthened their offer, also through partnerships and distribution of software packages, and appear on the market more and more as global service providers, able to support their customers along the whole business value chain of product, solutions and services.

Looking at the supply side of this market it is therefore possible to highlight the growth path of these companies. However, it is appropriate to interpret the situation also in the light of the go-to-market model adopted.

First of all, one immediately notices a strong symmetry between the ranking by dimension of the companies that supply local content and the companies on the demand

side: 70% of the latter, in fact, belong to the Small segment (up to 5 million Euro turnover) and only 10.3% to the Large segment (over 30 million Euro turnover).

Consequently, local software and services companies deal mostly with customers belonging to the industry, services or local public administration sector, compartments that are characterized by small-to-medium size companies.

Another relevant aspect, confirming the strictly local dimension of this market segment in Emilia-Romagna, is provided by the breakdown of the company revenues by geographic location: a good 60% of it is regional and often is provincial.

As a conclusion of the survey, we dealt with the theme of the development strategies concerning the companies' offers and go-to-market models. Businesses tend to consolidate already conquered positions, offering additional services to secured customers, increasing their fidelity. There is, however, no long-term strategic vision to develop business by moving to new geographic or product areas.

It is clear the fear of expanding beyond one's own possibilities in a difficult moment of the market that is limiting the growth capabilities of these companies, both in terms of size – i.e., the ability to answer the requirements of the Large Customers in the region – and in geographic terms – i.e., the ability to offer services on a wider scale than just the regional/local environment.

#### **CHARACTERISTICS OF THE ICT DEMAND**

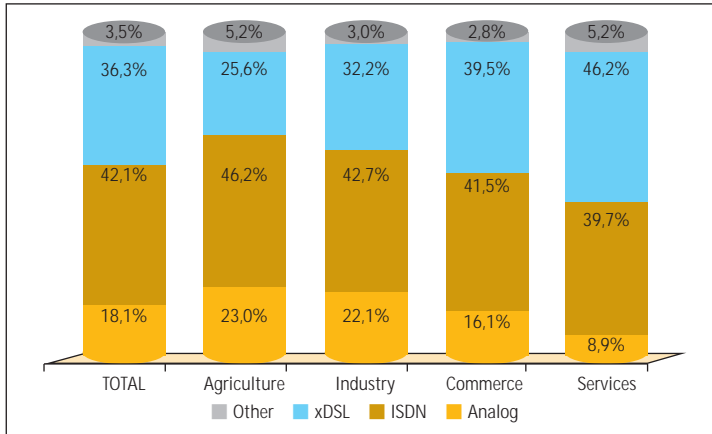
##### **INTERNET PENETRATION IN THE COMPANIES**

The analysis that we developed about the demand of technology solutions and services and Internet usage, has allowed us to sketch a profile of the situation in Emilia-Romagna.

First, the survey highlighted some data about the infrastructure, which are very important in order to better understand the demand scenario. The consideration that emerged first was that the size of the company strongly determines its disposition to the use of advanced technological solutions. Local units over 50 employees, in fact, show a good penetration of technologies such as LANs, routers, firewalls, while companies under that threshold, in most cases, simply have antivirus software. Moreover, while an Internet connection is a consolidated reality in 92% of the companies surveyed (note we did not survey smaller businesses up to just 4 employees) only 36% of the companies make use of an xDSL access. In general, 60% of those that do not use the Net declare not to feel the need of it, very clearly pointing out that there is a cultural factor rather than a lack of knowledge.

Another structurally relevant aspect is tied to the usage of Internet and email inside the companies: employees who constantly use Internet and email are less than half, 45.8% for Internet and 47.8% for email. These data are very important because, if specific infrastructures and a widespread technological culture are missing, it is obvious-

Types of connection to the Internet in local units (values in percentages %)



Source: Assinform/NetConsulting

ly difficult to imagine that the use of Internet and information technologies may take root and propagate correctly in the user companies.

As to online services, the scenario emerging from the survey indicates a high intensity of exploitation of the Net just for email and web banking, but a low utilization for e-government access and online purchases.

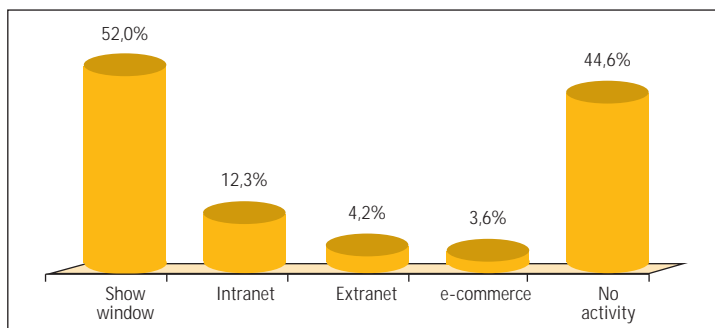
E-commerce is, in general, not much spread and developed: most of the companies limit their online presence to a show window web site. The penetration of e-commerce is directly proportional to the size of the companies and it appears only in companies with more than 100 employees.

The study confirms that the obstacles to the development of e-commerce are mainly related to a cultural barrier: companies are inclined to believe that, for the products they sell, a direct contact with the customer is necessary.

In addition, e-Procurement, i.e. buying online, proves to have a limited diffusion. A good 48% of the companies considered do not make any purchase online or, if they do, the focus is almost exclusively on non-strategic products and unlikely on raw materials. A fundamental element appears that explains why the Net is not much used for purchases, the fact that the companies' suppliers are not online.

This aspect is of absolute importance, because it leads us to understand that the obstacles to the development of an active presence of companies on the Net must be seen in the context of a business value chain. If partners, suppliers and customers are not on the Net, it is hard to envisage transferring even just a part of a company's activity online with any success.

### Business on the Internet (values in percentages % - multiple answers)



Source: Assinform/NetConsulting

### A COMPARISON WITH OTHER EUROPEAN REGIONS

A further analysis has followed a benchmarking methodology based on the comparison of common indicators used by 28 European Regions involved in the Biser project. To analyse the collected data, our approach groups the indicators into four clusters: access to internet within enterprises, internet use and skills within enterprises, software available within enterprises, diffusion and use of e-commerce.

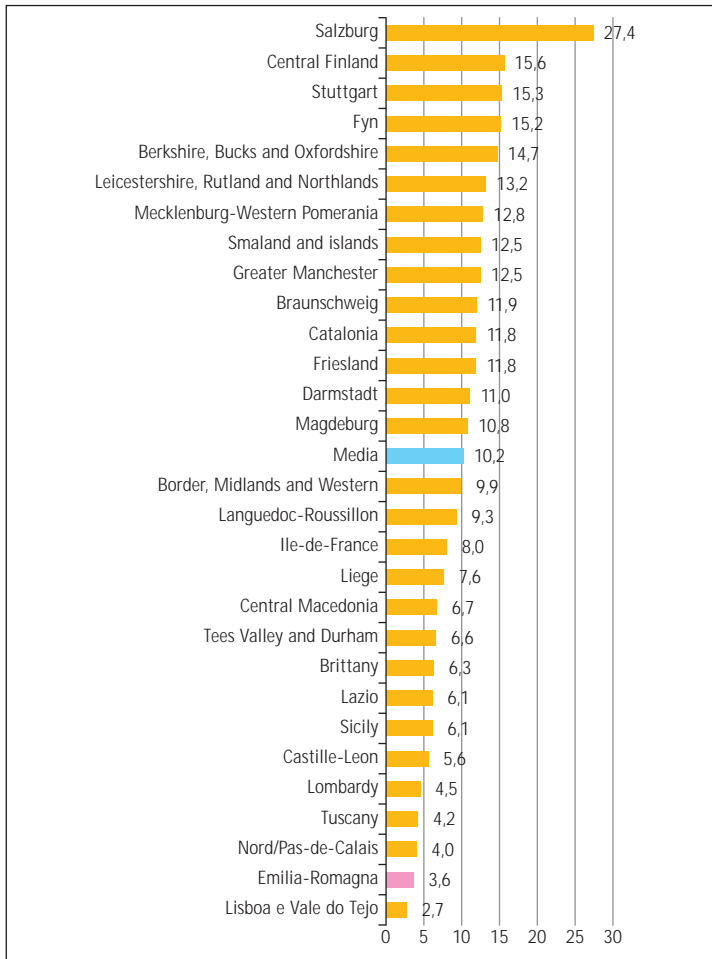
This study shows a widespread use of internet: almost 92% of Emilia-Romagna companies has internet connection, thus access to internet. This value places our region among the first positions between European regions.

A comparison with other regions shows how the lack of broadband affects the infrastructures framework within our enterprises. As shown after a comparison on the diffusion of different access technologies this fact is mainly due, on the one hand, to the lack of presence of optical fibre within our region, and on the other hand, to the absence of cable television in the national context.

E-mail is the most widespread application used within enterprises, a rate of 88,7% sets Emilia-Romagna region within the first ten places among European regions involved in the Biser project. This data is moreover, significantly higher than the European average. However Emilia-Romagna region is lagging behind concerning the number of local units involving employees in training courses. The surveys highlight only 21,8% local units involved, which places our region strongly behind the European average but in line with other Italian regions.

Concerning the diffusion of internet application/services, data shows a high penetration of LAN network among Local Units. Emilia-Romagna region has a significantly higher rate than the European average of our benchmark group, so that with its 75,8% rate, it sets itself at the third place within Biser project regions.

## Percentage of establishments selling on line



However this trend is not confirmed when looking at intranet network penetration rate (12,3%). This value is strongly below European average, and place Emilia-Romagna region at the last position within our benchmark.

It seems that enterprises widely perceive Internet as a communication instrument, well structured and organised but not well-exploited production and outsourcing production processes.

There is indeed, a lack of extranet network penetration within enterprises, and a low diffusion of e-commerce and e-procurement. Extranet networks, compared with other European regions' values, are not common in the regional context. On the other hand, there is some evidence that the use of websites and e-government services has also had a strong impact within enterprises, more than in other regions.

There are different reasons to explain regional weaknesses, such as the little diffusion of an entrepreneurship culture confident with new technologies, and the regional economic structure: the Emilia-Romagna region is characterised by industrial sectors with a medium-high technological level, and a high widespread diffusion of SMEs. These sectors and firms are the least keen to use advanced-e-business applications.

Some recent developments in the ICT market could provide a way to overcome the problems faced by less e-aware companies. In particular, the emergence of intermediary players who provide an interface in the exchange of companies' information with the outside, could enable less e-aware companies to take advantage of advanced applications.

Such reflections outline the major role that can be played by the new managing figures of business functions in outsourcing or of intermediation of relations and communications, particularly for the creation of business networks and in the automation of co-operative productive procedures, which requires a high level of trust, a sector-specific knowledge and an ICT culture equally spread among all the business partners. Thus the sharing of ICT solutions among several companies represents an opportunity both for the diffusion of the computer applications and for the growth of ICT culture of the regional production system.

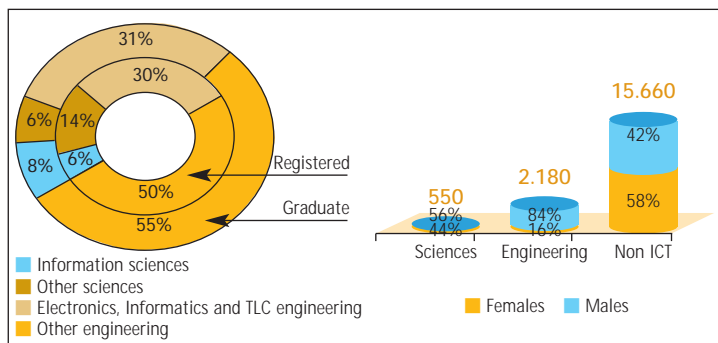
#### **EDUCATION AND TRAINING IN THE ICT SECTOR, IN EMILIA-ROMAGNA: TYPE OF COURSES AND NUMBER OF GRADUATES**

In Italy, in 2001, about 171,000 students obtained the Laurea (Italian University Degree): 15% went through an ICT academic course, representing also 10% of those who enrolled in that year, about 1,703,000 students. In Emilia-Romagna, the ICT graduates were about 2,700, representing 15% of the total, about 18,400 new graduates. In the same period, the majority (80%, versus 82% at the national level) of the 2,700 ICT graduates of the Regione belongs to the Engineering group, which collects the largest quota of male graduates (84%), as at the national level.

A focused survey concerning Doctorates (Dottorato di Ricerca) showed that the 150 students (approximately) that graduated in ICT subjects in 2001 represent 35% of the total Doctorates at the regional level. 66% of the ICT-related Doctorates belong to the Sciences group. This percentage would be higher, if the data about the ICT graduates

in the province of Parma (about 30) were available. About 50% of the ICT Doctorates come from the Bologna Athenaeum.

New ICT graduates (+) and non-ICT graduates, by group and gender, Emilia-Romagna, 2001 (absolute values and percentages)

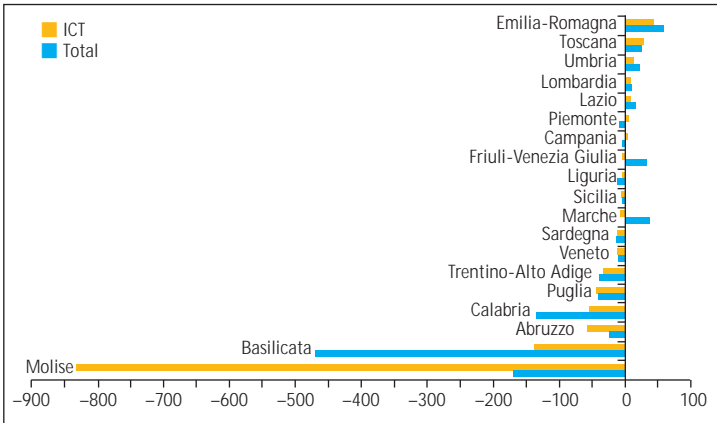


Source: Murst 2001. Elaboration: Assinform/Statistica-UNIMIB.

(+) ICT curriculum: Engineering and Sciences group. (-) Non-ICT curriculum: Groups: Agriculture, Architecture, Chemistry and Pharmacy; Economics and Statistics, Physical Education, Geology and Biology, Law, Teaching, Arts, Languages, Medicine, Political Sciences, Psychology.

Considering the number of new ICT graduates, Emilia-Romagna is, in absolute terms, second only to Lombardia. It is instead the first region, in relative terms, not only for education and training (both ICT-related and general) but also for attracting, educating and providing Laurea degrees to non-resident students. At a first look, the local demand/supply system of ICT job opportunities shows a surplus of graduates. This surplus in reality is due, on one hand, to the excellence of the regional university education system – a pole of attraction and development of human capital in the ICT domains – and, on the other hand, to the need of expanding to wider areas than the regional boundaries. The expansion should include not only the ICT supply poles, but also the poles on the demand side outside the region. The regional university poles for strictly ICT higher education are Modena and Forlì, while Bologna is a university pole for ICT “allied” subjects. The comparison with other European Countries shows that the quota of OECD ICT graduates over total graduates is 23% for Bologna and 22.9% for Emilia-Romagna, lower than Italy (25%) and the UE (26%), but higher than the average of the OECD countries (22%).

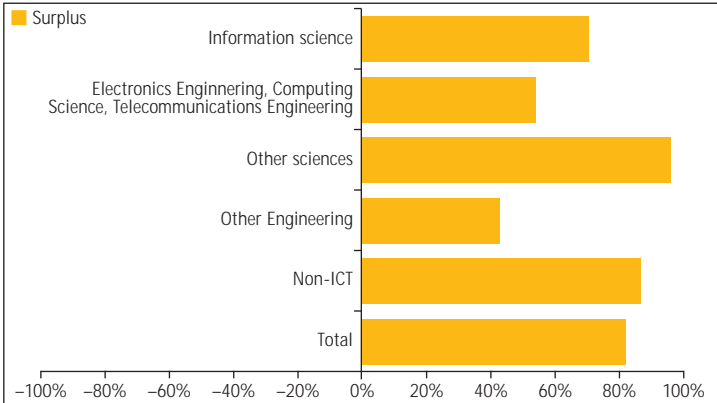
Net attraction of ICT(+) new graduates and total graduates (for every 100 resident graduates), by region, Italy, 2001



Source: Murst2001. Elaborations: Assinform/Statistica-UNIMIB.

(+) ICT Degrees: Engineering and Sciences Group. (-) Non-ICT Degrees: Groups: Agriculture, Architecture, Chemistry and Pharmacy; Economics and Statistics, Physical Education, Geology and Biology, Law, Teaching, Arts, Languages, Medicine, Political Sciences, Psychology

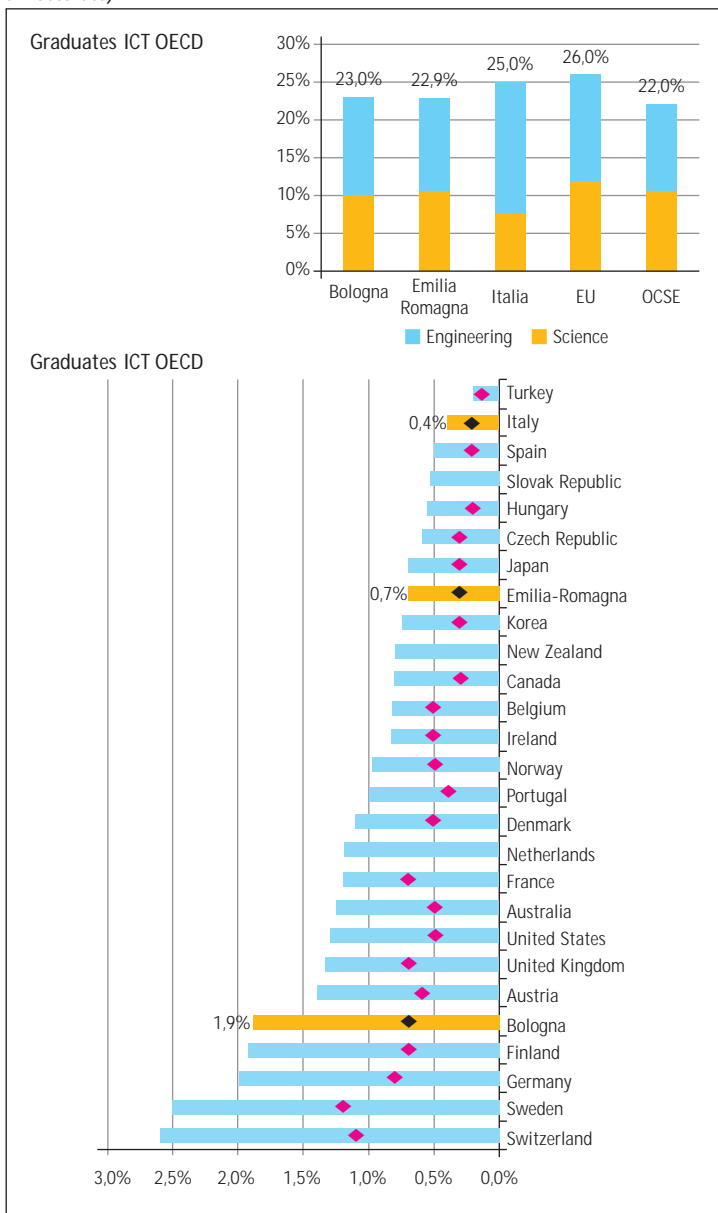
Skills shortage of ICT(+) graduates and non-ICT(-) graduates, Emilia-Romagna, 2003 (% over total)



Source: Murst2001, UNIONCAMERE – MIN. DEL LAVORO: Excelsior2003. Elaboration: Assinform/Statistica-UNIMIB.

(+) ICT Degrees: Engineering and Sciences Group. (-) Non-ICT Degrees: Groups: Agriculture, Architecture, Chemistry and Pharmacy; Economics and Statistics, Physical Education, Geology and Biology, Law, Teaching, Arts, Languages, Medicine, Political Sciences, Psychology

ICT OECD (\*) graduates by group, 2001 (percentage over total graduates) - ICT OECD (\*) and total Doctorates, 2001 (percentage over population of age typical for a Doctorate)



Source: MURST 2001, OECD 2000. Processing: Assinform/Statistica-UNIMIB.

(\*) ICT OCSE: 42 (Life sciences), 44 (Physical sciences), 46 (Mathematics and statistics), 48 (Computing), 52 (Engineering and engineering trades), 54 (Manufacturing and processing), 58 (Architecture and building).

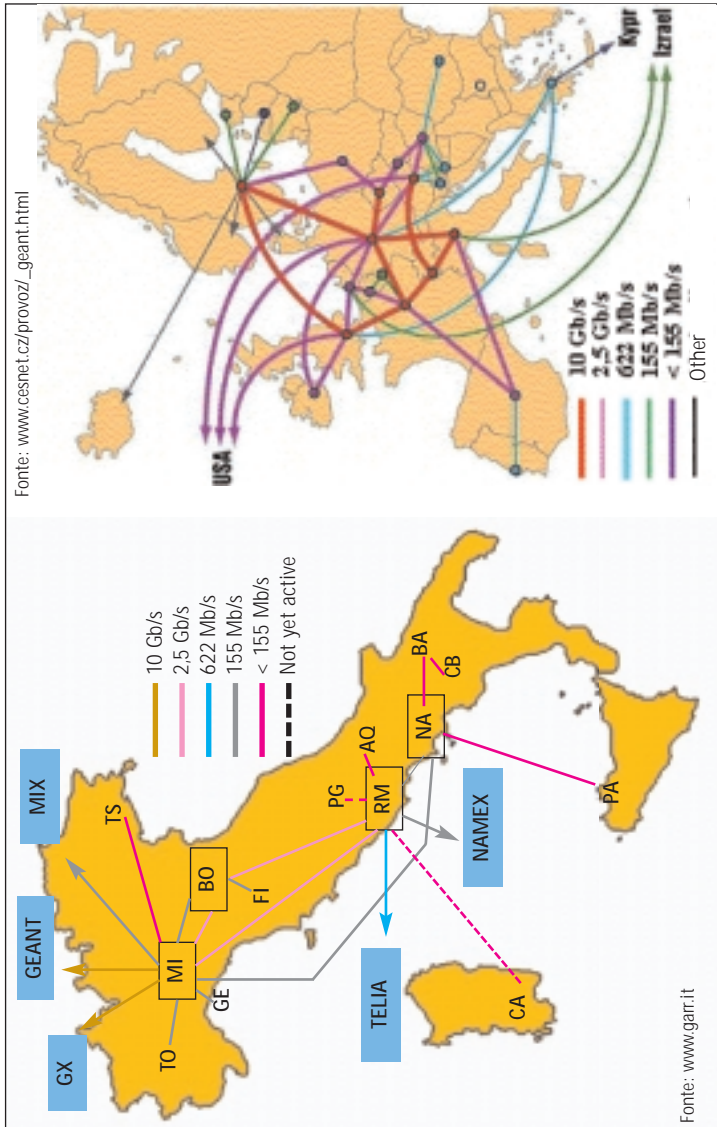
ICT Assinform: 44 (Physical sciences - excluding chemistry), 46 (Mathematics and statistics - excluding actuarial science and statistics), 48 (Computing), 52 (Engineering and engineering trades), 54 (Manufacturing and processing), 58 (Architecture and building - excluding Architecture and town planning).

**A FOCUSED LOOK AT THE CONNECTIVITY INFRASTRUCTURES  
OF UNIVERSITIES AND RESEARCH CENTERS**

**INTERCONNECTION OF RESEARCH CENTERS AND UNIVERSITIES**

Italian Research Centers are interconnected via the GARR (Group for the Harmonization of the Research Networks), whose institutional task is not only the implementation and management of the Italian scientific Research and University Network, but also the connection to the other European and worldwide Research Networks and to the Internet.

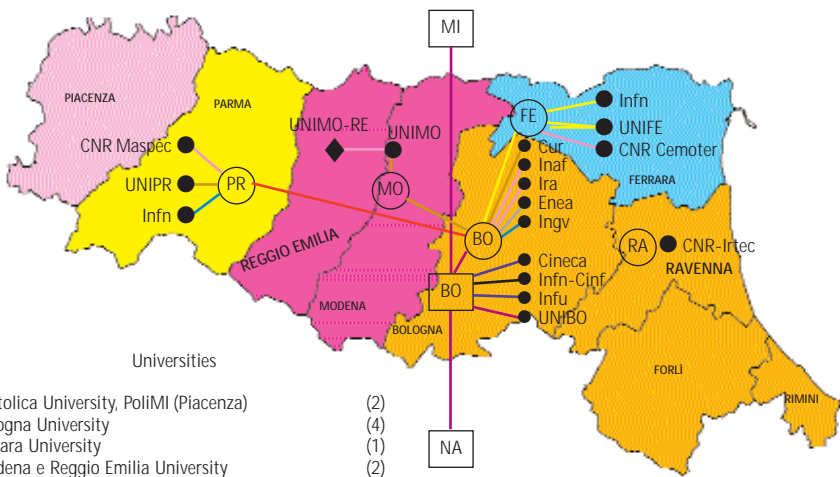
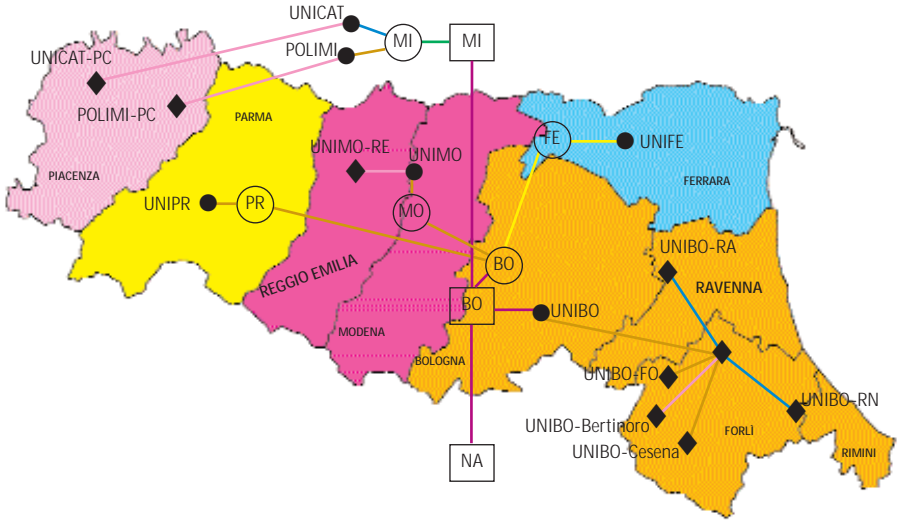
Emilia-Romagna is connected to the worldwide, European and Italian research network via an access node to the GARR network (the Bologna node). The majority of university and non-university research centers of the region connect to the Bologna node.



The Research Network and the interconnections with European and Worldwide networks, Italy, 2003

Source: Murst 2003, [www.garr.it](http://www.garr.it).

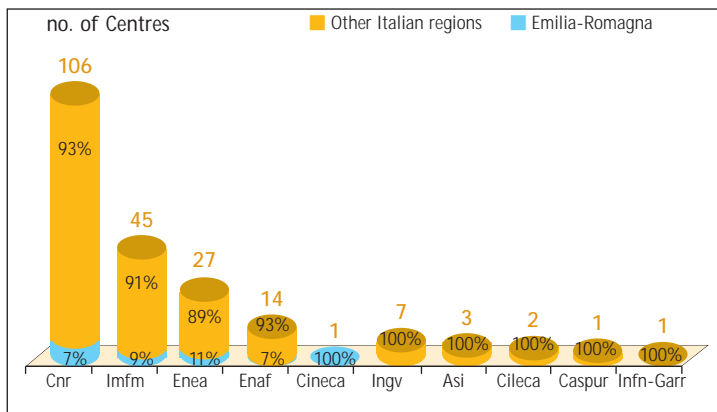
Elaboration: ASSINFORM/InfoGenesi/Statistica-UNIMIB.



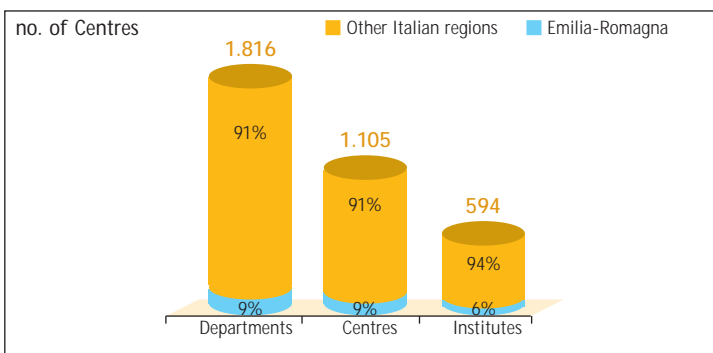
- Universities
- Cattolica University, PoliMI (Piacenza)
  - Bologna University
  - Ferrara University
  - Modena e Reggio Emilia University
  - Parma University
- |            |              |            |                   |
|------------|--------------|------------|-------------------|
| — 10 Gb/s  | — 270 Mb/s   | — 16 Mb/s  | □ Garr - backbone |
| — 2,5 Gb/s | — 155 Mb/s   | — 12 Mb/s  | ○ Garr            |
| — 1 Gb/s   | — 28-34 Mb/s | — 4-8 Mb/s | ● Garr site       |
| — 622 Mb/s | — 24 Mb/s    | — 2 Mb/s   | ◆ Secondary site  |
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### ACADEMIC INSTITUTIONS AND RESEARCH CENTERS

Out of the 77 Italian Universities, 4 (or 5.2%) are located in Emilia-Romagna. Out of the 538 University sites on the national territory, 63 (or 11.7%) are in Emilia-Romagna. Out of the 3,722 Italian Research Centers 308 (or 8.3%) are located in Emilia-Romagna. In particular, we can count in the Regione 292 university research Centres (or 8.3% of the total at the national level) and 16 non-university Centres (or 7.7%). Out of the 207 non-university Italian research centers, 16 (or 7.7%) are located in Emilia-Romagna. Centers such as INGV, ASL, CILEA, CASPUR, INFN-GARR do not have regional sites. The University Research Centers in Emilia-Romagna give work to 5,600 professors and researchers. The Bologna Athenaeum employs 54.7% of the teaching staff. One can notice not only the high number of university centers, but also the number of centers per 100 teachers.



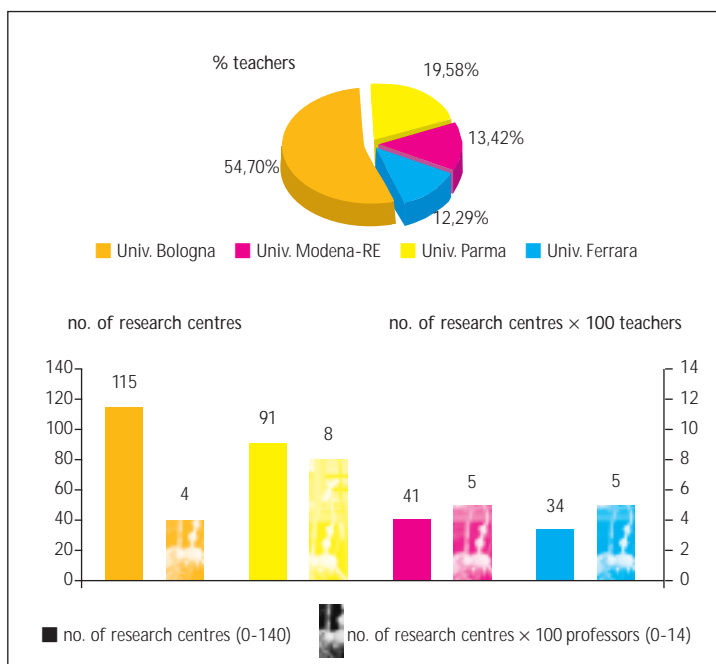
Non-University Centers, by type of Center, (absolute values and percentages %)  
 Source: Murst 2003, ASSINFORM/InfoGenes. Elaboration: InfoGenesi/Statistica - UNIMIB



University Centers, by type of Center, (absolute values and percentages %)

Source: Murst 2003, ASSINFORM/InfoGenes. Elaboration: InfoGenesi/Statistica - UNIMIB

Centres and Centres per 100 teachers, Universities, Emilia-Romagna – Italy, 2003

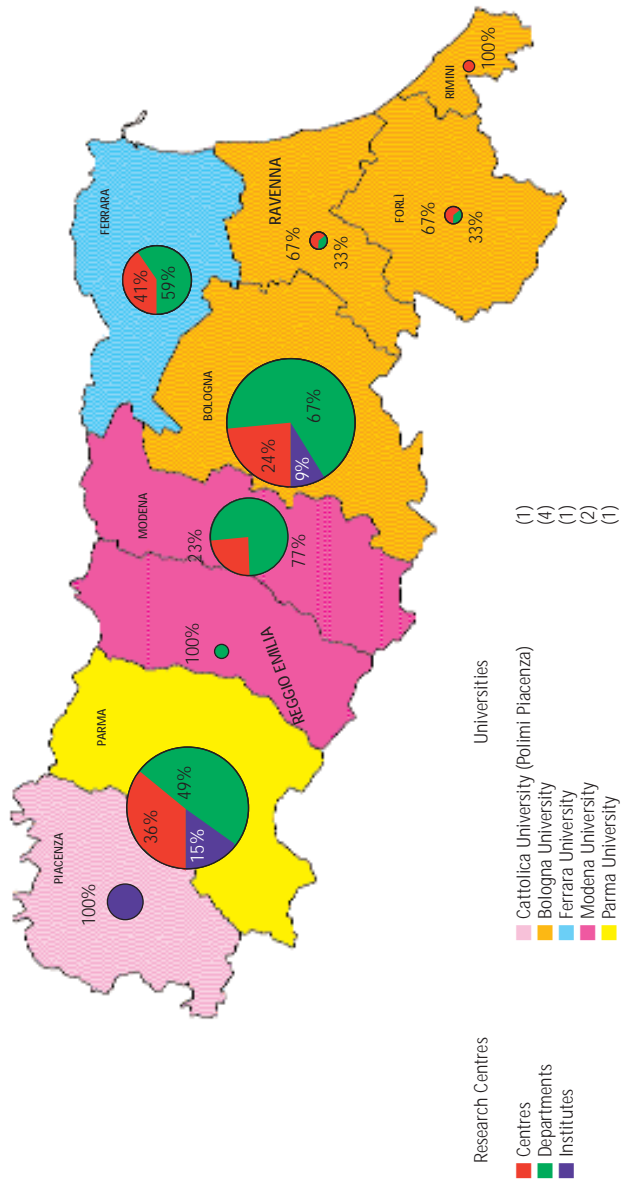


Source: Murst 2003, ASSINFORM/InfoGenes. Elaboration: InfoGenesi/Statistica - UNIMIB.

The geographic distribution of the different university research centers is disparate: the 292 centers in Emilia-Romagna are concentrated in the provinces of Bologna and Parma (64%).

University research centers by Province, Emilia-Romagna, 2003 (intervals: deviations from average)

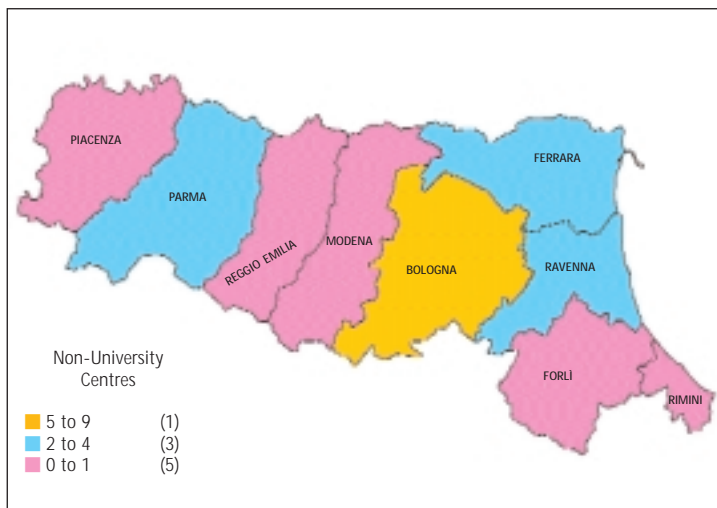




Source: Murst 2003. Elaboration: ASSINFORM/InfoGenesi/Statistica-UNIMIB.

Out of the 16 non-university centers in the region, 9 (or 53.3%) are located in the province of Bologna. One counts an average of 2 non-university centers per province, with a geographic distribution that ranges from a maximum of 9 centers per province to zero in four provinces.

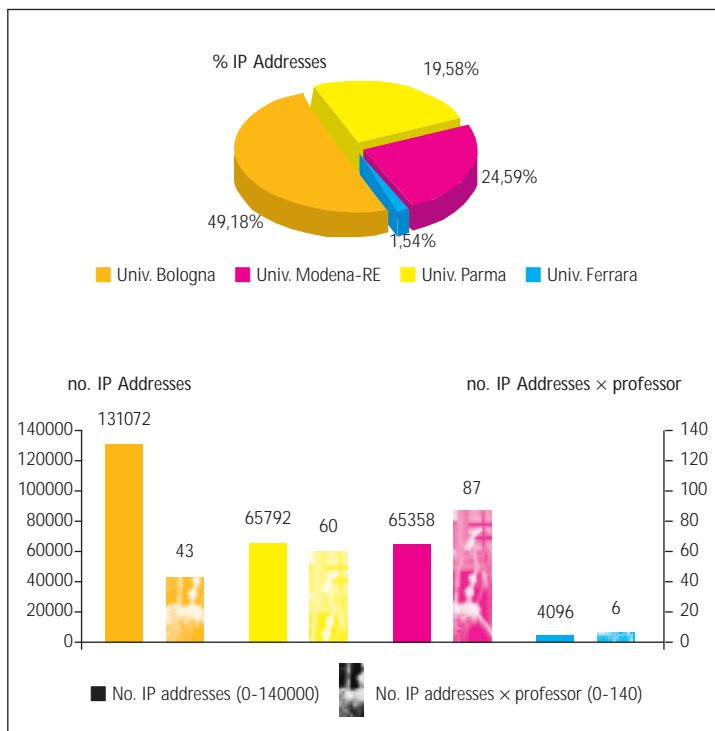
Non-university Centers, Emilia-Romagna, 2003 (intervals: deviations from average)



Source: ASSINFORM/InfoGenesi. Elaboration: InfoGenesi/Statistica-UNIMIB.

The ability of a network to support a maximum number of simultaneous connected users (static addresses) can be summarized as the absolute number of IP addresses and the number of IP addresses per teacher. 49.18% of the IP addresses owned by the academic institutions in the Regione are available to the University of Bologna. However, the number of IP addresses per teacher of this university (43) is lower than the one of the Universities of Modena and Parma.

### IP addresses and IP addresses per teacher, by University, Emilia-Romagna, 2003



Source: Murst 2003, RIPE, ASSINFORM/InfoGenesi. Elaboration: InfoGenesi/Statistica-UNIMIB.

The results we have found, a very small part of which has been summarized here, match the long-term strategy drawn in the Piano Telematico (Telematic Plan): to endow the region with technical infrastructures of excellence, in order to normalize a territory that is already “networked”, but currently made up only of poles and peripheral endpoints.

The Region appears to believe that it is not sufficient that metropolitan cities connect to and become “near” to the rest of the big cities of the world. Besides the Bologna area, already saturated by infrastructures, it is necessary to connect the off-center poles, thus creating non-localized infrastructures as premises for future private investments. We can see the outflow of capitals to peripheral areas open to development and not chocked by bad urbanization as the basis for an “integrated basin of regional development”.

## CONCLUSIONS

The supply side of the market is mainly characterized by small size businesses, this aspect being the sign of a series of structural problems.

The limited average size of the sector denotes the presence of companies in some way similar to artisans groups, typically with employees and consultants engaged in different roles, without much structure and addressing the market more by opportunity than by strategy. This aspect is to be related with their range of action, mostly limited to the province and to customers which are generally small and medium businesses, namely in the industry compartment.

Supply side companies, in fact, only minimally deal with larger entities, such as companies belonging to the banking or distribution sector.

We are then able to state that, in general, *the type of ICT offer in the region Emilia-Romagna is not able today to fully satisfy the demand of large companies*, which therefore are often obliged to address themselves outside the region.

The analysis of the structure of Emilia-Romagna by dimension, employees and compartments confirms the statements above. The highly fragmented structure of the ICT companies, on one hand, is a limit but, on the other hand, is a guarantee of a constant level of employment in a period of heavy restructuring of the ICT compartments. In addition, the structure of the region by type of employee (25% of independent workers versus 19% at the national level), allows to better adapt the local ICT context to periods of diminishing demand.

As to the local demand side in the region, what can be gleaned from the survey we carried out is that a large percentage of companies, mostly the smaller ones, are still marginally involved in the process of technological evolution, with reduced budgets planned for infrastructures, limited usage of the Net both as users and as actors of e-commerce initiatives. Such an attitude is motivated by a scarce technological culture and, therefore, by a scarce knowledge of the benefits that can derive from the intensive exploitation of the new technologies.

Regione Emilia-Romagna revealed itself, instead, as a pole of attraction for **Education and Training** in the ICT fields. The Regione actually educates non-residents to be delivered to the out-of-region markets but, at the same time, it can profit of a large batch of ICT-savvy human capitals. In our Information and Knowledge Society, this can represent the “fuel” essential for the growth and competitive development of the compartments.

The observation of the structure of the Academic Institution and Research Centers and of their geographic distribution reveals a specific orientation by the Regional Government. All Universities are involved, starting from Bologna, which is organized in

poles. The creation of MANs in Romagna is improving the access to local public administrations and providing a better connection among the various institutions including, by synergy, the interconnection of the local units of each institution. From the analysis of the connectivity of Universities and Research Centers a set of results emerged that match the long term strategy of the Regional Telecommunication Plan: The plan intends to endow the Regione with technical infrastructures of excellence, in order to normalize a territory which is already "networked", but currently made up only of poles and peripheral endpoints.