Cross Cutting Issues- Session 3:

ICT Supply Side: An Analysis of Some Statistical Sources for Italy

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Abstract

The OECD [2] definition of the ICT sector includes the manufacturing and services sectors related to information and communication technologies. Including "content industries" as well, the definitions of information economy or information industries are defined.
As regards those definitions, in Italy, and in particular at ISTAT (the Italian Statistical Office), analyses of the services sector were carried out first, creating special projects to develop statistics. Three projects covered the information industries sector: a) the project for audiovisuals (covering activities in ATECO 9211-9220), b) the project on the Information Technology (covering ATECO 72) c) the project on telecommunications (covering activities in ATECO 6420). Moreover, several "non specific" sources can be used to elaborate data to describe the supply side.
In this paper, the three "specific" projects and other "non specific" statistical sources, such as the survey on innovation in services sector, will be closely analysed. Then the following topics will be discussed: the importance of definitions adopted, methodological problems and problems connected with existing classifications. Lastly, gaps will be identified and initiatives to develop statistics for these sectors will be introduced.

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[2] OECD Statistical Panel on Information society inside the ICCP Committee.

1. Introduction and some definitions

The OECD definition[3] of the ICT sector includes the manufacturing and services sectors related to information and communication technologies. Including "content industries" as well, the definitions of information economy or information industries are outlined. The analysis of the social impact of information economy will lead to the concept of information society.
The table below summarises these definitions:

Information Technology Industry (Manufacturing and Services)		+		*Telecommunication Industry* (Manufacturing and Services)		=	**ICT Sector**	
ICT Sector	+	*Content Industry* (Manufacturing and Services)			=	**Information Economy or Information industry**		
Information Economy		+	*Social Impacts*		=	**Information Society**		

The activities of these sectors are defined by the ISIC classification. NACE Rev.1 and ATECO91 are the corresponding classifications, respectively at European level and at national level. ATECO91 was introduced in Italy for the 1991 Census of Industry and Institutions. This means that the different classifications can be connected in a common framework (see appendix 1), thus it would be possible to define manufacturing and services activities which form ICT and information economy (where ICT sector and "content industries" are included).

As regards above definitions, in Italy, and in particular at ISTAT (the Italian Statistical Office), first analyses of the services sector were carried out, creating special projects to develop statistics. Three projects have covered the information industries sector: a) the project for audiovisuals (covering activities in NACE-ATECO 9211-9220 b) the project on the Information Technology industries (covering NACE-ATECO 72), and c) the project on telecommunications (covering activities in NACE-ATECO 6420. These projects aim at developing specific surveys, so that those peculiar aspects that cannot be observed by traditional surveys on balance-sheets of enterprises, can be grasped.
Several other "non specific" national sources can be taken into account to define a general outline aiming at studying the ICT sectors and information industries, as for instance the surveys on small and medium enterprises and on big size enterprises or the survey on services sector innovation.
It should be pointed out that each project had a different schedule and was started with different goals, thus explanations and data provided are not mutually related.
The table in appendix 2 is a list of statistical sources that can be used for the variables established by OECD and by EUROSTAT to analyse the notion of information society. Those variables characterise both supply and demand of goods and services belonging to the sectors at issue.

In this paper, the three specific projects and other "non specific" statistical sources will be closely analysed. Among other "non specific" statistical sources the survey on innovation in services sector has been selected. Then the following topics will be discussed: the lack of sources, methodological problems and problems connected with existing classifications. Lastly, strategies to develop statistics for these sectors will be introduced.

[3] OECD Statistical Panel on Information society inside the ICCP Committee

2. General framework and analytical results from some national sources

2.1 General framework

Since 1995 the two surveys (SME-small and medium size enterprises and SCI-big size enterprises) on enterprise balance-sheets can be used for economic structural variables. In fact all production sectors are covered and data are processed up to 4 digits details of ATECO.
Taking in consideration the OECD definitions of ICT sector and Information industries it is possible to elaborate data from SCI survey for the following basic economic variables:

Table 1 - *Structural variables for the definitions of ICT and Information Industries*
Year 1995 (million of lira and number of units and persons)

ATECO Code	ECONOMIC ACTIVITIES	Number of enterprises	Number of employees	Turnover	Value added	Gross fixed investments
22.1	Publishing	276	34,991	14,617,167	4,405,410	311,272
22.3	Reproduction of recorded media	19	1,094	685,477	154,565	21,821
30.0	**Manufacture of office, accounting and computing machinery**	**118**	**28,430**	**17,441,636**	**3,417,975**	**508,398**
31.3	**Manufacture of insulated wire and cable**	**110**	**12,181**	**6,142,296**	**1,375,640**	**215,892**
32	**Manufacture of radio, television and communication equipment and apparatus**	**498**	**82,984**	**22,083,557**	**7,527,913**	**1,703,825**
33.2	**Manufacture of instrument and appliances for measuring, checking, testing and other purposes, exc. industrial process control equipment**	**248**	**21,995**	**4,909,522**	**2,121,681**	**168,865**
33.3	**Manufacture of industrial process control equipment**	**121**	**7,919**	**2,091,290**	**808,471**	**106,937**
51.43	**Wholesale of household appliance, audio apparatus, television**	**326**	**15,920**	**17,456,760**	**2,175,676**	**165,544**
51.64	**Wholesale of office equipment and machinery**	**143**	**12,514**	**9,999,436**	**1,558,575**	**99,235**
51.65	**Wholesale of other machinery for industry, trade and navigation**	**188**	**11,286**	**7,455,556**	**1,571,219**	**175,127**
64.2	**Telecommunications**	**14**	**94,797**	**31,827,084**	**23,108,286**	**6,907,008**
71.33	**Renting of office machinery and equipment (including computers)**	**2**	**94**	**46,450**	**22,482**	**7,454**
72	**Computer and related activities**	**990**	**70,948**	**13,572,026**	**6,622,815**	**559,119**
92.11	Motion picture and video production	72	3,897	2,158,935	1,713,903	50,946
92.12	Motion picture and video distribution	7	310	182,320	73,846	2,369
92.13	Projection of video and motion picture	10	252	42,111	17,776	2,423
92.2	Radio and television activities	48	16,737	7,809,039	3,589,079	231,229
92.4	News agency activities	8	1,565	315,727	201,805	11,696
92.51	Library and archives activities	8	329	13,753	9,513	1,926
	Manufacturing industry + services					
	Total ICT	**2,725**	**375,805**	**140,834,652**	**53,899,812**	**10,848,633**
	Total ICT - Radio and television activities (92.20)	**2,677**	**359,068**	**133,025,613**	**50,310,733**	**10,617,404**
	Total content industries	448	59,175	25,824,529	10,165,897	633,682
	Total Information Industry (ICT + content industries)	3,125	418,243	158,850,142	60,476,630	11,251,086
	Services only					
	Total ICT	**1,711**	**222,296**	**88,166,351**	**38,648,132**	**8,144,716**
	Total ICT - Radio and television activities (92.20)	**1,663**	**205,559**	**80,357,312**	**35,059,053**	**7,913,487**
	Total content industries	153	23,090	10,521,885	5,605,922	300,589
	Total Information Industry (ICT + content industries)	1,816	228,649	90,879,197	40,664,975	8,214,076
Total services		**21,162**	**1,974,122**	**623,467,310**	**170,531,670**	**27,958,066**
Total economy		**102,167**	**8,012,330**	**2,847,820,313**	**774,948,167**	**134,414,219**

Source: *Istat Survey on big size enterprises (equal and more then 20 employed). 1995 Year*

As we can see in table 1 ICT sectors in term of number of enterprises has a weight of 2.6% (if we consider the radio and television activities the weight rise to 2.7%) on the total economy. The employees in ICT industries are 4.5% of the total number of employees, while the ICT turnover and

value added are respectively 4.7% of the turnover of the hole economy and 6.5 %of the value added of the total economy. The ICT gross fixed investments are 7.9% of the total gross fixed investments.
If we consider the definition of information economy, including the content industries, the number of the enterprises has a weight of 3.1 of the total enterprises of the economy. In term of employees the information economy portion is 5.2 times the employees of the total economy, while turnover represent 5.6% of the total economy and the value added and gross fixed investments are respectively 7.8% and 8.45% of the total economy.
The content industries are 0.4 times the total enterprises and have a weight of 1.1% in term of value added. Although the content industries represent the smallest share in term of enterprises and value added, they have specific distribution channels which were strengthened in the recent past.
In ICT sector or Information economy most are services enterprises and most are small and medium size enterprises, as the general Italian economic structure.

2.2. Information Technology Project

The IT project is part of ISTAT statistics on services to enterprises, and in particular of the ATECO K section.
This project, which started in the second half of nineties, aims to develop sector statistics on specific services from surveys. In other words the project aims at gathering data on complementary aspects which are not detailed by Istat traditional surveys on enterprises.

2.2.1. Characteristics of the Italian market on which the IT survey was based

The market of information technology has grown at a very fast pace in the recent years, as a result of entering a new era with different consumption patterns and where Information Technology is adopted.
Figures reflect new structural phenomena and different behaviours of users.
The importance of projects and professional services is growing, this means that enterprises are changing the type of investment, from investments to increase the number of equipment to structural investments, which are related to the revision of information technology systems.
Several factors determined the strong growth of Information Technology demand, namely: the globalisation of markets, reduced time to market, which means greater competition, an increase in offered products, the diffusion of new distribution channels, fragmentation of users into micro-markets characterised by specific requests.
In other words, trade has become more complex for enterprises which increased their demand of information technology to meet the new requirements
All sectors were concerned by the growth of expenditure for technological innovations, in particular: distribution, manufacturing, services, banking and insurance companies, central and local government, even though to a less extent.
From the viewpoint of quality, the increase in Information Technology in these sectors confirms the trend of enterprises. Structural changes are implemented with the purpose of reducing costs and increase productivity. In this way structural changes represent an alternative to the existing office automation.
Then, enterprises are redefining their relation with the market, characterised by a more careful customer-orientation.
The offered product changed from a centralised computing pattern - mainframe - to a workstation-based pattern, according to a new type of business organisation based on half-independent operative units.
The new and different products offered by Information Technology are the result of the growing attention paid to decisional and operative decentralisation which facilitates a greater independence of end users.
At the beginning of the ‘90s, technological innovation was a competition advantage, a necessary

instrument to support the effectiveness of business processes. However the growing diffusion of information and communication technology has completely changed the role of technology within enterprises, Information Technology has become a business operation mode itself.
The increasing importance of information technology in the sector of electronic marketing as well as new ways of distribution and of establishing relations with customers are very meaningful examples. Then new territories would be discovered in this field.
The Internet and Intranet diffusion allow to understand the "change in the IT market", mainly due to real-time information besides a new ways of working (teleconferencing for example) and organising the business.
The *'net'*, is the driving centre of all computing activities, and it is affecting how business is developed and enhanced.
The *"net"* can really modify and improve business, as for example the quality improvement of information available to enterprises, the possibility of opening the enterprises net to new customers and suppliers, the possibility to communicate with *'remote nets'*.
System capabilities, the creation of new and more complex architectures and hardware evolution are other important elements.
Application software is a basic element as it allows to fully exploit available resources. Application software ranges from custom-made software meeting specific requirements and a good integration level to standard application software, which fulfil general need and specific requirements are not needed.
In 1995, the positive trend of the Information Technology market, did not influence the servicing sector as it is clear from the results of the Istat survey. In fact this sector is remarkably decreasing because of price competition and of the evolution of services related to hardware installation and management (after-sales service).
Thus, *Information Technology* becomes a real central point for competition within global economy, it is a necessary instrument for business, not only in terms of efficiency but also as effectiveness. Information technology plays then a strategic role for the market.

2.2.2. Description of the survey and of variables included in the questionnaire on Italian information technology industries

In 1996 for the first time, Istat carried out a survey on Italian information technology industries.
It was a sample survey for enterprises with less than 20 employed, whereas it was a total survey for enterprises with 20 employed and over (the results were published in Istat Rapid Notes of 31.7.97 on IT enterprises).
The reference population included only those industries where software production was prevailing on hardware manufacture.
ANASIN (National Association of Telecommunications and Information Industries) and A.I.P.A (National Authority for Information Technology in the Government), took part in the research. The adopted methodology, classifications and definitions allow to compare data with other economic sectors and with data from other countries.
It was a rather complex survey, which could be defined as "structural" on one hand, aiming at the basic characteristics of information technology enterprises. On the other hand it was rather innovative, as it focused on the following, less analysed aspects: advertising of business, distribution of turnover by type of customers, training, how personnel was hired, external consultants, quality certification. The following data were included in the form:
1. general and demographic information (identification, legal status, if part of an enterprise grouping, controlling company and nationality, recent transfers or company take-over if any, local units, year in which IT activity was started);
2. about services provided by the enterprise (turnover percentage from an analysis of information technology services, subcontract);
3. economical data (balance sheet data: turnover, purchase of goods and services, investments,

salaries and social costs);
4. employment (number of employed, type of labour contract, qualification, age class, seniority in the enterprise, professional skills),
5. concerning quality.
Moreover, the form was compliant with the Structural Business Statistics Regulation, approved by the European Community in the same period.
According to EU classifications, IT services enterprises belong to the Ateco 72 "division" (information technology industries and related activities).
Firms where hardware manufacture exceeds software production are not included. If this be the case, enterprises are considered as belonging to manufacturing sector (they are included in Ateco 30.02 *Manufacture of computers and other information processing equipment, except repair*).
Thus a survey on all the enterprises carrying out any type of information technology activity (that is from hardware and software production to marketing these goods and products, as it often happens for big-size enterprises) would have a very complex field to analyse.
However data would not provide an exhaustive picture if industries mainly manufacturing hardware were not to be included, despite producing software as well.
The Ateco 72 division is subdivided into six groups:
1. hardware consultancy (consultancy and software consultancy provided by hardware manufacturers and sellers is not included);
2. software consultancy and supply (maintenance of non-custom made licensed software and consultancy are not included);
3. data processing (with customer software and with software provided by information technology enterprises, data entry, management of information equipment owned by third parties);
5. data base activities(establishing, storage, selected data supply);
6. other related activities (telematics, robotics, eidomatics, etc...).

This year Istat carried out a further survey, with reference to 1996. This survey is part of the European pilot study on Information Technology. Five States took part: Finland, Italy, Holland, United Kingdom and Spain.

The 1995 survey results showed a concentration of enterprises in the 1 to 5 employed class (with reference to employed classes and geographical areas) probably due to the great number of sole proprietorships; the same class of enterprises and, IT industries prevail in the North. One third of the enterprises operating in Italy in this sector is in the North - West of Italy.

Chart 1 - *Employed by geographical area*

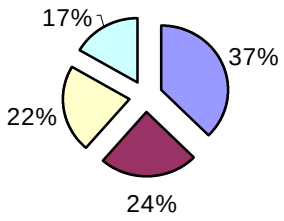
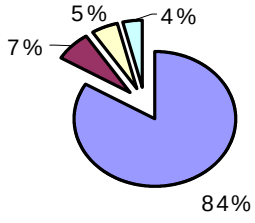


Chart 2 - *Employed by employed class*



Source: *Istat : 1995 sample survey*

Legenda to Chart 1:

- North-West
- North-East
- Centre
- South

Legenda to Chart 2:

- 1-5
- 6-9
- 10-19
- ≥ 20

The analysis of industry distribution by economic examined activity class (Ateco ‘91) has shown

that half of information industries processed data on own account or for third parties..
There is a great number of individual concerns, which represent one quarter of the total, namely 8,654. Sole proprietorships are present almost everywhere, especially in the South, where there are 2,322.
As far as the legal status is concerned, some enterprises (8,555) prefer limited liability, and other enterprises (7.929) prefer limited partnership. These enterprises are mainly concentrated in the North - West of Italy, where 2,288 were recorded.
With reference to the legal status selected by the different categories of information technology activity specified in the Ateco '91, hardware is mainly produced by limited liability companies and sole proprietorships (72.10) they also provide the majority of software and the related consultancy (72.20).

Table 2 - *Enterprises by economic activity classification and legal status. Year 1995*

ATECO	INDIVIDUAL CONCERNS	GENERAL PARTNERSHIP	JOINT STOCK COMPANY	LIMITED PARTNERSHIP	LIMITED LIABILITY COMPANY	OTHER	TOTAL
72.10	383	169	126	5	574	249	1,506
72.20	4,051	1,008	198	1,304	3,162	158	9,881
72.30	3,316	2,398	164	6,154	3,710	676	16,418
72.40	28	7	4	133	18	19	201
72.50	614	312	80	100	589	242	1,937
72.60	262	52	12	233	502	4	1,065
Total	**8,654**	**3,946**	**584**	**7,929**	**8,555**	**1,340**	**31,008**

Source*: Istat - 1995 sample survey*

Data processing (72.30), is provided by almost every type of company (legal status), except joint stock companies, whose presence in the market is rather residual.
It is interesting to point out that the same type of enterprises supplying hardware, take care of its maintenance (72.50), namely sole proprietorships and limited liability companies.
Enterprises supplying hardware provide even other information technology activities (72.60), which include telematics, robotics and eidomatics as well as training. Limited partnership companies are included in this grouping.
The analysis of turnover by geographical area showed that North - West accounts for more than one quarter of total turnover, equal to about 25 billion of billion lira, it is followed by the Centre (7 billion of billion lira), where enterprises with 20 employed and over are mainly located.

Table 3 - *Turnover of IT industries by employed class and geographical area. Year 1995 (billion of lira)*

GEOGRAPHICAL AREA	Employed class				Total
	1 - 5	6 - 9	10 - 19	20 and over	
North - West	2,208	1,144	783	6,744	10,879
North - East	1,286	353	474	2,407	4,520
Centre	1,580	319	511	4,485	6,895
South	581	286	157	1,586	2,610
Italy	**5,655**	**2,102**	**1,925**	**15,222**	**24,904**

Source*: Istat - 1995 sample survey*

The highest figure for turnover was recorded for software consultancy and supply, which represents 39% of total turnover, data processing percentage is 28% and it is the type of economic activity recording the greater number of enterprises.

Table 4 - *Turnover of IT industries by employed class and economic activity. Year 1995*

ECONOMIC ACTIVITY	Employed class				Total
	1 – 5	6 - 9	10 - 19	20 and over	
72.10	111	42	71	3,371	3,595
72.20	1,818	1,249	746	6,043	9,856
72.30	2,655	640	944	2,744	6,983
72.40	56	-	2	197	255
72.50	355	148	38	1,228	1,769
72.60	660	23	124	1,639	2,446
Total	**5,655**	**2,102**	**1,925**	**15,222**	**24,904**

Source*: Istat - 1995 sample survey*

Data on employment showed that a great number of employees of this sector works in the enterprises located in North - West and in the Centre. The employed in the two geographical areas represent 63% of total employed.

Table 5 - *Employed in IT industries by employed class and geographical area. Year 1995*

GEOGRAPHICAL AREA	Employed class				Total
	1 – 5	6 - 9	10 - 19	20 and over	
North - West	22,573	4,599	5,986	26,325	59,483
North - East	14,803	3,562	4,029	13,222	35,616
Centre	14,833	2,875	2,897	22,129	42,734
South	10,397	1,768	2,325	10,296	24,786
Italy	**62,606**	**12,804**	**15,237**	**71,972**	**162,619**

Source*: Istat - 1995 sample survey*

Their concentration follows the same distribution pattern of activities with higher turnover and greater number of enterprises, namely data processing and software consultancy and supply (the employed of these two types of economic activities represented 80% of all employed in information services).

Table 6 - *Employed in IT industries by class of employed and economic activity. Year 1995*

ECONOMIC ACTIVITY	Employed class				Total
	1 – 5	6 - 9	10 - 19	20 and over	
72.10	656	72	442	8,588	9,758
72.20	16,204	4,456	5,778	33,126	59,564
72.30	37,206	7,089	7,810	18,546	70,651
72.40	309	0	10	1,128	1599355 f BT 6.92 0.92

Certification?". The expected answer was positive or negative.
9.8% of surveyed enterprises, said that they had Business Quality Certification.
Thus it is possible to infer that:

- information technology industries with quality certification are mainly located in North - West (50,4%), whereas 33% is located in the Centre; the other enterprises are equally distributed between the North -East and the South;
- 73% of enterprises with quality certification are joint-stock companies, 27% limited liability companies; enterprises with other type of legal status do not seem to be included in this group;
- from the standpoint of total turnover, information technology enterprise with quality certification represent 26.7%, of which 25% are joint-stock companies and 1.7% are limited liability companies;
- enterprises with quality certification have a productive structure where software services are the main activity, they represent 73% of turnover, whereas hardware manufacture represents about 10%, data processing '11% and other activities 6%.

The last two questions were about the quality certification standard adopted, and the nationality of the Quality Control Body.
ISO9000 is the most common standard, 92.2% of the enterprises adopted this standard. The other adopted standards were ISO9002, AQ.API 3, UNIA, almost equally distributed among the remaining share of industries.
73% of the Quality Control Bodies is Italian.

2.3. Telecommunications Project

In 1996 this project was started to develop statistics on telecommunications. Within this project a new survey on the Internet providers was planned. This new survey is being carried out now. The first results from this survey will be available by next year

2.3.1. General outline of the telecommunications sector in Italy.

Telecommunications are one of the central Italian sectors due to their specific function and the continuous interactions with the economic, technological and legislative fields.
This sector and enterprise operating in it are to be further studied and analysed owing to the great changes brought about by new complex phenomena, such as multimedia, convergence, liberalisation and competition. The analysis should aim to understand structural changes in enterprises (reference markets, structure of employment etc...) as well as to overcome the difficulties in classification. As traditional technological differences were cancelled (data, audio and video transmission) it is necessary to define new and more suitable reference classifications.
Act on Communication Privacy (n° 249 dated 31.7.1997) established that the Ministry of the Postal and Telecommunications Services should be replaced by the Ministry of Communications (with the following competence: directing policy, technological innovation and economical development), and the operational management of Postal Services was given to a Financial Entity, The Post Office Body
An independent Authority was established as a result of market liberalisation and complexity (together with some important operations such as the re-arrangement of the television broadcasting sector and the recent denationalisation of STET). This Authority has to define rules to guarantee the market and consumers and generally speaking this Authority should guarantee communication privacy and issue rules on telecommunications and on television broadcasting.
Actually the Ministry of Communications is temporarily performing activities and functions that should be carried out by the Authority. It is believed that when the Authority will be fully operating, its effects could be traced in quality, services costs and the development of an Italian industry will be favoured.
Telecommunications nets are another important field, in Italy apart from the public telecommunications net (TELECOM ITALIA) there are other alternative infrastructures, realised by

enterprises providing public services according to special concessions for private use: FFSS (State Railways), SOCIETA' AUTOSTRADE (Motorway Companies), SNAM (Pipelines National Company), ENEL (National Electricity Board). Now, these nets play a very important role because there are competitors in the market and because owing to their capabilities, they can become providers of audio and data communication services.
The Authority believes that these nets should be considered a strategic resource for the Country, not only from a technological viewpoint, but also from an economic standpoint. In fact they are an important opportunity to develop competition in the TLC market as service providers can choose from more than one operator.
The concession of licence to install a telephone system net to provide voice communications to two private operators: Wind (la joint venture ENEL-DEUTSCHE TELECOM-FREANCE TELECOM) and Infostrada (OLIVETTI MANNESMANN grouping) is the first result of this changed scenario; a more dynamic scenario is expected to develop as new operators will enter the market, such as ALBACOM (controlled by MEDIASET and BNL) and BRITISH TELECOM. A tender will grant the license for mobile phones to a another operator apart from TIM e Omnitel Pronto Italia.
It is not believed that the effects of this new competitive scenario will be felt in the short term, as this is a field "naturally" linked to monopolistic patterns and because crucial topics should be solved, such as the cost of interconnections (the amount a third operator has to pay to TELECOM to use the telephone system net), the attribution to different operators of TELECOM telephone numbers, and how the new operators would contribute to the global service.

2.3.2. Macroeconomic data on the sector

Istat carried out the "SCI" survey on enterprises with more than 20 employed. The results show that, in 1995 the turnover of TLC enterprises was about 32,000 billion of lira, which represents an increase by 7.5% if compared to the previous year. This positive trend was confirmed even by the analysis of 1994 data compared to 1993 (7,7%); in these two years turnover amount was respectively 29,696 and 27,573 billion of lira. The overall change in the two years is 15.7 %. In 1995 there were 94,585 employees in this sector, that is a decrease by 4.3 % with reference to the previous year but 0.4 % more than in 1993.
The two tables below show the results of ATECO 64.20 (Telecommunications services) analysis from the provisional ASIA register, referred to 1995.

Table 7 - *Ateco 64.20: enterprises by employed class (January 30, 1998)*

EMPLOYED CLASS	ENTERPRISES	No. OF EMPLOYED
UP TO 19	60	222
20-49	5	169
50-199	8	739
200-499	1	467
500 E +	4	99,890
TOTAL	**78**	**101,487**

Source: *provisional ASIA register*

Table 8 - *Ateco 64.20: Enterprises by regions (January 30, 1998)*

REGIONS	No. OF ENTERPRISES	No. OF EMPLOYED
PIEMONTE	6	1,250
LOMBARDIA	18	332
TRENTINO	1	3
VENETO	5	42
FRIULI	2	6
LIGURIA	2	3
EMILIA R	4	12
TOSCANA	2	34
UMBRIA	1	6
LAZIO	22	97,153
ABRUZZO	2	3
CAMPANIA	2	5
PUGLIA	2	14
CALABRIA	2	5
SICILIA	5	2,617
SARDEGNA	2	2
TOTAL	**78**	**101,487**

Source: *provisional ASIA register*

2.3.3. Survey on the Internet providers.

At the end of July 1996, ISTAT started a study to get some initial details on the Internet. The Internet is a phenomenon that is penetrating a growing number of world population strata both at work and at home owing to the broad range of opportunities it offers.

Basically, the Internet is a net connecting thousands of L.A.N. (Local Area Network) that is local nets located all over the world. TCP / IP is the protocol allowing communication. Data stored in the hosts logged to the LANs can be accessed using this protocol.

Accessing the INTERNET is easy and increasingly cheaper: in fact only a PC, a modem, and an access node are needed to navigate in the Internet, exchanging data, pictures, audio in real time and from all over the world.

According to AIIP (Italian Association of Internet Providers) there are 450,000 users accessing the Internet.

A study carried out by Network Wizard estimated that there are 73,364 computers, (owned by 2,669 different organisations), permanently logged on the Net.

Internet providers are the survey unit, as they can provide lots of information useful to study this phenomenon.

A survey on the Internet users could have been a possible alternative. However, it did not seem to provide all the required information (at least, in this initial phase) as users cannot provide specific data (traffic through the node, length of logging, etc..), and because time required to gather data would have been too long. Moreover methodological reasons played an important role, because the population is not known as the users are not identified.

The population of the survey is derived from integrating different registers.

A list was prepared using the following sources:

1) Ministry of the Postal and Telecommunication Services, General Office for licences which has and updates the list of the Internet Providers. According to Legislative decree 17.8.95 and to Presidential decree 420 dated 4.9.95, the Internet Providers should be registered. More than 100 firms are included in this list;

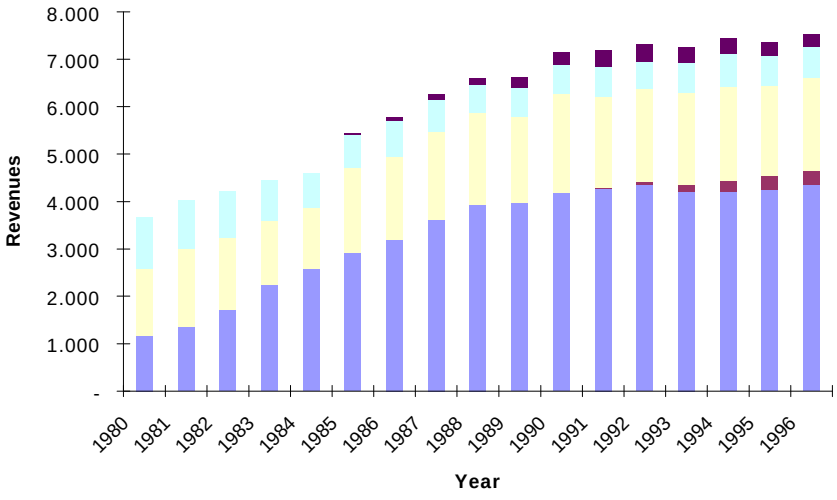
2) G.A.R.R. register (Team to Harmonise Research Nets);

3) A.I.I.P. register (Italian Associations of Internet Providers);

4)Register of 2 specialised publications: “I- NEWS” and “INTER.NET”;
5) Video On Line register.
From above registers it was found that in Italy there are about 400 Internet Providers.

Revenues from the audiovisuals sector showed a growing trend from 1980 to 1996, they changed from 3,678 billion of 1990 constant lira in 1980 to 7,533 billion of 1990 constant lira in 1996. Revenues are represented by advertising, public subscriptions, public grants, subscription to pay-tv, revenues from movies and home-video.

Chart 3 - *Revenues from audiovisuals enterprises. Years 1980 - 1990 (billions of 1990 constant lira)*

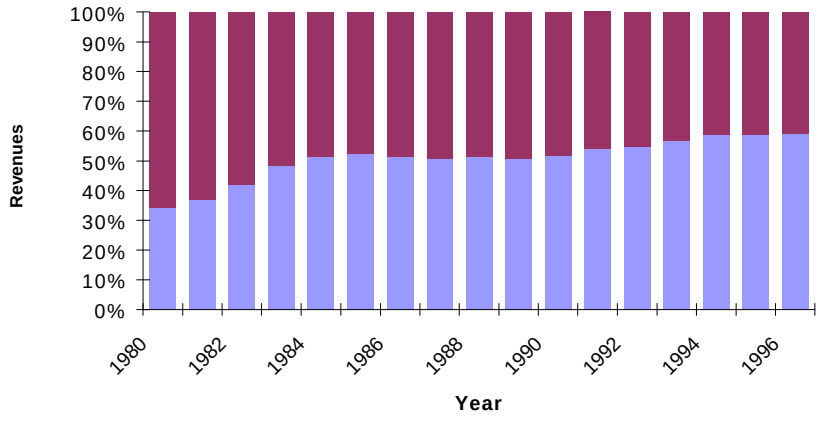


Legenda

- Home video
- Revenues from cinema tickets
- Public tv subscription and public grants
- Pay-tv subscriptions
- Advertising

With reference to data at constant prices revenues in the radio-television sector are represented by advertising, subscription to public tv, and subscriptions to pay-tv (since 1991) and, in the observed period, revenues have increased. Italian cinema is given state grants to guarantee the quality of products. The amount of grants did not change from 1989 to 1996, with only two exceptions: 1989 and 1995 when a sensible decrease was recorded. Revenues from cinema tickets show a clear reduction from 1980 to 1996. Advertising in the sector of cinema is a too small part of revenues. Thus, in cinema, end users play a basic role. In other words, cinema tickets are a direct indicator of what users prefer the best.
Subscription to public tv was the main source of revenues in the early eighties for radio-television. The advertising has become the main source, and in 1996 it represented 67% of total revenues.

Chart 4 - *Distribution of revenues from advertising 1980-1996 Years (percentage values)*



Legenda

- Revenues from advertising in newspapers, periodicals and bill-posting
- Revenues from advertising in Television, radio and motion pictures

In the sector of audiovisuals, revenues from advertising have become the main source and this is reflected in the market of advertising. In 1980 the share of advertising in audiovisuals was only 34% of the total, while in 1996 advertising rose to 59%.

The 1992 pilot survey on audiovisuals showed that, taking into account enterprises of this sector and their structural data, enterprises can be divided into four sectors of economic activity: production of cinema and video, distribution of cinema and video, cinema projection and radio-television activities. In 1992, the majority of enterprises was recorded in the radio-television sector (3,018 units). The number of firms in the other three sector is definitely smaller: production (989), projection (911) and distribution (210), *(table 10).*
The audiovisuals sector is characterised by a typical Italian phenomenon: the high presence of small and very small enterprises. In fact only 3% of enterprises has 20 employed or over and 60% of employed work in these enterprises *(table 10).*

Table 10 - *Enterprises and employed of the audiovisuals sector by employed class and type of economic activity. Year 1992*

ECONOMIC ACTIVTIIES AND EMPLOYED CLASSES	Enterprises	Employed (a)	Employees	Part-time employees
Production	989	9,027	2,724	111
1-19	*946*	*3,160*	*2,010*	*99*
≥ 20	*43*	*5,867*	*714*	*12*
Distribution	210	1,452	1,202	95
1-19	*194*	*675*	*444*	*73*
≥20	*16*	*777*	*758*	*22*
Projection	911	3,393	2,721	623
1-19	*903*	*3,185*	*2,550*	*567*
≥20	*8*	*208*	*171*	*56*
TV/Radio	3,018	33,058	26,139	1,037
1-19	*2,931*	*10,857*	*5,219*	*539*
≥20	*87*	*22,201*	*20,920*	*498*
Total	**5,128**	**46,930**	**32,786**	**1,866**

(a) The item employed includes full and part-time employed, self-employed and seasonal workers
Source: *Istat – Pilot survey on Audiovisuals*

Employment demand from enterprises of this sector is shown by data on employed[4] in the four sectors of economic activities included in the core definition of audiovisuals: production, film and video distribution, film projection and radio-television activities.
In 1992, data from the pilot survey on audiovisuals showed *(table 10)* that there were 46,930 employed mainly working in radio-television activities (70%). The other part is employed in production (19%), projection (7%) and distribution (4%).
In radio-television, projection and distribution, employees represent 80% of total employed. On the other hand, in production, day labourers, self-employed and seasonal workers represent about 70% of employed. In the sector of projection 23% of employed has a part-time labour contract, whereas in the other sectors, the share of part-time employees can be neglected.
Taking in consideration Labour Force survey data we can see the typical professions of the sector *(table 11)* which represents the employment offer.
Occupied of the audiovisuals sector are highly qualified, in fact these jobs require a specific training which can be acquired through study and apprenticeship.
About 50% of the labour force in the field of entertainment and cultural activities, which include libraries, archives and museums, is employed in the sector of audiovisuals. Typical jobs of this sector represent 0.3% of the total number of employed in the whole economic system.

Table 11 - *Occupied of the audiovisuals sector by type of job 1993-1996 (absolute average figures)*

TYPES OF JOBS	YEARS			
	1993	**1994**	**1995**	**1996**
Specialists in photography and cinema	17,439	20,215	19,641	22,138
Radio, television and cinema production technicians	12,843	12,921	12,332	11,180
Directors , art directors and actors	10,672	8,739	7,243	7,954
Managers of cinema, theatres and similar				

The audiovisuals pilot survey for 1992 even showed that firms adopt the following types of legal status: joint-stock companies (48%), partnerships (22%) and sole proprietorships (20%).
Moreover, the survey analysed the following economic variables: turnover, purchase of goods and services, grants for production, value added, labour costs, capital assets and foreign trade(exports and imports) *(table 12)*.

Table 12 - *Main economical variables of audiovisuals enterprises. Year 1992 (figures in million of current lira)*

ECONOMIC ACTIVITIES	Turnover [(a)]	Grants for production	Purchase of goods and services [(b)]	Value added	Labour cost	Investments [(c)]	Imports	Exports
Production (cinema- and video)	2,675,305	24,331	1,967,179	1,481,542	235,978	70,341	121,508	540,669
Distribution(cinema and video)-	1,804,253	14,168	1,742,699	61,555	85,475	9,003	314,797	72,968
Projection (cinema)-	675,512	14,656	363,427	149,172	92,077	94,058	-	-
TV/Radio (Radio-television activities)	8,965,831	691,803	5,484,030	3,481,802	2,311,034	750,246	284,018	20,107
Total	**14,120,901**	**744,958**	**9,557,335**	**5,174,071**	**2,724,564**	**923,648**	**720,323**	**633,744**

Source: *Istat – Pilot survey on audiovisuals*

(a) Turnover = revenues from: advertising, subscriptions and private grants, marketing of televised or radio works produced on own account, other radio -television revenues, public subscription.

(b) Purchase of goods and services = purchase of goods and services (purchase of copyrights for television programmes, music programmes, theatre performances, movies,…), purchase of goods and services for retail, purchase for transport, rental of equipment, banking, information technology services, insurance services,…), expenditure for personnel, tax and duties due for production.

(c) investments = acquisition of capital investments over the year (brand new or used, in particular equipment and plants for production, furniture and fittings, means of transport, sites, buildings and land).

Radio-television activities represent the bigger share of turnover (63% of total), and 93% of grants for production is for that activity.
The radio-television sector represents the greater value added (67%) followed by production (29%).
As far as costs are concerned, the purchase of goods and services represent 57% of the radio-television sector, 21% of production, 18% of the distribution sector and the remaining 4% represents the sector of projection. Total labour cost is 85% of the radio-television sector, 9% of production and 6% is the percentage for the other two sectors.
81% is the percentage of capital equipment investments and the remaining 19% is the percentage of the other sectors.
The greater imports percentage of foreign trade is recorded in the distribution sector (44%), whereas imports in the radio-television sector represent 39% of the total. On the contrary, 85% of exports are concentrated in the production sector, while this item is only 3% of total for radio-television. This means that production has a positive foreign balance, whereas distribution and radio-television sectors have negative foreign balance.

2.4.2. Future development of the audiovisuals sector and measurement problems

The introduction of digital technology in the audiovisuals market started substantial innovation processes which led to a real revolution in the way relationship with mass-media are devised. The deep transformations of media (audiovisuals are part of the media) will affect more and more economy and society. Knowledge and information will play an increasingly strategic role for audiovisuals enterprises. Broadly diffused digital technologies allow to store a great amount of data as well as real-time and high access to data (audio, pictures, text).
The convergence process started by the new technologies brought about the creation of the information industries market (OECD definitions), which results then from convergence of telecommunications, information technology and media. Each sector gives its specific contribution to this process. Convergence is based on multimedia that is «every product or service which can be interactively used. Products and services offer data, audio and pictures integrated through

information and telecommunications technologies»[5]. Information industry sector is composed by the following elements: telecommunications which are the infrastructure, media (audiovisuals) which are the content: archives and the current production of its sub-sectors (tv, cinema, video, press, etc.) and information technology which is hardware and management software.
The information and communication technologies development introduced deep innovations in the sector of audiovisuals, a number of applications have been implemented which will change products and production processes. These applications are now widely used in the audiovisuals sector which is changing its arrangement and reference markets. New services and audiovisuals products are available using digital technology and the Internet.
Specific broadcasting techniques have been implemented to be used on the Internet (WebTV) besides the possibilities of using satellites to access the net.
Home-theatre is another example of what multimedia is: a television set, a videotape recorder and a high-fidelity equipment are integrated to re-create at home the typical environment of cinemas.
The relations among sectors (Television, radio, cinema and home-video) are changed by these new products and services. The new relations established among sectors have a number of effects: the convergence of sectors, a greater productive specialisation for some applications and the development of new sectors such as satellite digital television.
The improved transmission capability and quality of products as well as the lack of limitations due to national borders have introduced great changes even in production. New digital technologies brought about a number of mergers, alliance so that industries in the fields of telecommunications and information technology would develop new capabilities in the fields of radio-television and cinema.
The possible applications of the digital system range from digital television, radio and cinema to interactive television and satellite digital transmission.
The Italian scenario[6] for the ICT market followed the trend of the international convergence process so that more outlets to new markets[7] could be created and international competition could be face. It is important that infrastructures and organisations should be able to adjust to the new European and national contexts.
In Italy, it is very difficult to meet the challenge of these new technologies because there are marked territorial differences within the Country and because the sector of high value added services is not developed enough.
Although these structural constraints, to comply with European provisions Italy should favour market globalisation processes and the diffusion of new technologies and media both in educational and learning processes as well as in European cultural programmes.

For this future scenario current nomenclatures cannot reflect the cross-cutting character of new informational technologies. In fact, owing to the use of telephone, the Internet or other telecommunications technologies the new informational technologies cross all sectors. In the sector of media all the supply side should be revised as well: from audiovisuals equipment manufacturing to audiovisuals production, distribution and projection.

New indicators should be specifically established and adopted to consider the digital innovation in audiovisuals. For example, a national reference and related indicators are no longer meaningful after the introduction of digital satellites. Now analyses should consider a global reference where market is on an international level and the production of services should not be strictly located near consumers. Thus it is important to distinguish television channels by the type of transmission

[5] Assinform, 1997 report on information technology and telecommunications.
[6] The main source of provisions concerning this is sector is the Maccanico Act reforming the television and telecommunications sector. It was passed by Parliament in July 1997

[7] The Italian television market is characterised by concentration, while in telecommunications there are some outlets for competitors, competition is the rule in information technology.

device used: (cable, broadcast and satellite) and system (digital and analogic). There is a clear change in the structure of revenues and costs of the new providers of audiovisuals services: overlays with other economical sector are rather common (information technology and telecommunications).

Tables 13 and 14 show an application of above indicators. Data are from the survey ISTAT carried out to contribute to the Communication Outlook of OECD.

Table 13 - *The structure of broadcasting in Italy*

	1995	1996	1997
Total subscribers to CaTV	0	0	46,272
Subscribers to infrastructures Catv of the major public telecommunications operator	0	0	46,272
Subscribers to analog satellites	…	…	…
Subscribers to digital satellites	2,000	20,000	200,000
Other subscribers	800,000	800,000	870,000
Broadcast TV channels (Private)	12	12	12
Broadcast TV channels (Public)	3	3	3
Broadcasting TV operators	10	10	10
Cable channels	0	0	14
Analog satellite channels	2	2	3
Digital satellite channels	2	20	59
Average daily time spent watching television by household (hours)	…	…	3'56"
Annual subscription to colour television (Lira)	158,000	161,450	161,450

Source: *Istat*

Table 14 – *Revenues of major broadcasting operators in Italy (in current lira)*

Broadcast Television		

2.5. Other “non specific” sources: reading the data from the survey on technological innovation in services.

A rough idea of innovation activities in services for information and communication technologies can be reckoned from the results of the first survey that ISTAT carried out on technological innovation services in 1997, 1993-95 was the reference period.

In several countries statistical surveys on innovation technology are carried out adopting definitions and methodologies recommended in the “Oslo Manual” jointly produced by OECD and EUROSTAT. A number of different information on the introduction of new products or services or concerning new production processes for services and products are provided by these surveys. Since 1989, when the first edition of the Oslo Manual was published, attention has been mainly given to innovation in industry, and in Italy as well, statistical surveys mainly observed industries. However, the new 1997 edition of the Oslo Manual acknowledged the importance of the services sector or rather of the services sectors. In fact they are producers and users of technologies and they play a basic role as active agents in the implementation and introduction of new technologies. The first 1997 survey that ISTAT carried out on technological innovation services was based on these new methodologies.

Surveys on innovation aim to get information on enterprises which introduced new products or services, or enterprises which adopted new production processes. Attention is mainly given to the *subject* introducing new technologies rather than on the *object* of innovation (adopted technologies, equipment purchased, products developed, etc.). This means that surveys provide a lot of information on the behaviour of enterprises introducing innovation (how much was spent on innovation, goals of innovation, information sources on innovation, difficulties, impact of innovation on economic performance, etc.) but information on the *content of innovation* is scarce, that is on what innovations really are.

Such a rigid approach, based on the subject, was partly changed in the survey on technological innovation in services, enterprises were asked to provide a short description of the main technological innovations introduced between 1993 and 1995.

Using these specifically codified data, it was possible to add some integrating data processing, and it was possible to identify innovative enterprises, that is enterprises which had introduced new services or processes (or in some cases improved existing processes) using information and communication technologies.

The ISTAT survey on technological innovation in services observed a sample of 6,005 enterprises, which represented a reference population of 19,301 enterprises with 20 employees and over. A total survey was carried out for enterprises with 200 employed and over. The survey ended in September 1997, when 55.5% of the population had been surveyed, 1993-95 is the reference period.

Enterprises in the services sector were first divided into "innovative" and "non innovative" enterprises. In the 1993-95, enterprises were considered as "innovative" if they had introduced in the market technologically new services, or improved services, or had adopted technologically new or improved processes of production. The survey showed that less than one third of enterprises in the services sector (31% of total) introduced innovations in the 1993-95 period *(table 15)*.

Analysing the adopted technologies it was possible to define "innovative" enterprises out of the 6,000 surveyed enterprises. The analysis was aimed at finding out the enterprises where information or communication technologies had been adopted to develop or produce new services. The results showed that 82.4% of enterprises had adopted information technologies to introduce innovations in products or services. 35.1% of enterprises used information technologies to introduce new services or processes, whereas 47.4% of enterprises associated information technologies and other technologies, thus information technologies were mainly used to automate the processes through which services are produced. As far as sectors are concerned *(table 15)*, financial activities and insurance company were the greatest users of information technologies to innovate the services they provide. Moreover, the quality improvement in the relations between banks and customers are clear. Information technologies play an important role in all fragmented sectors characterised by widely

diffused commercial networks connecting big and small industries, or central offices and local units. A number of users took advantage of the possibility of more intense connection: car-makers and agents, retailers (at least distribution for large establishments) air and sea transports.
These brief remarks are an evidence that "nets" characterise the provision of services and of the importance that communication technologies are acquiring in the technological innovation for services enterprises. Several elements allow the full exploitation of capabilities offered by information technologies: the diffusion of mobile phones (widely diffused in the sectors of transports and distribution) and the even greater diffusion of local data transmission nets, which are integrated at industry level. Intranet solutions and the connection to other external users over the Internet are other opportunities offered to services industries. In fact, taking into account the 6,000 services industries which introduced technological innovations in the 1993-95 period, 41.7% adopted innovative activities resulting from the application of information technologies, 38.3% used information technologies with computing. These data show the current trend of services industries: they tend to "open" their information systems (implemented with consistent investments to automate a number of sectors: administration, warehouse, marketing, etc..) exchanging data with suppliers, retailers and customers in real time, and in some cases business effectiveness greatly benefited from the new technologies.
Therefore, surveys on technological innovation provide important data on what could be defined as the "**pervasivness degree**" of specific technologies, as the analysis of information and communication technologies by economic sector or business size have shown. However surveys should be not only "subject" centred but should take into account "object" aspects as well.
The surveys on technological innovation, and in particular the survey on technological innovation in services enterprises allow to calculate the amount of investments made in specific years (in this case 1995). Data in table 16 show that in 1995 services enterprises spent about 7,000 billion of lira in technological innovations.
The quota of investments spent on software for technological innovations should be extrapolated from all sectors. In this way it is possible to get information (even partial) on the demand for the information technology sector (including the information technology services sectors which is observed by the survey and described in the paper on demand). On the whole, in 1995 services enterprises spent on software 14.2% of investments in innovations, that is about 1,000 billion out of the total amount spent on innovations (7,000 billion).
It should be pointed out that **investments in software** observed by the surveys on technological innovations include all the programmes specifically developed to adopt new processes for services production or related to the development or introduction of new services. Thus, almost all custom-made software is included in this definition, whereas standard software packages are not included, namely those packages used to operate information systems or in office automation. This means that surveys gathered data on the quota of investments in software characterised by the greatest value added, and which is a remarkable part of demand. Small and medium sized software houses (an important part of information technology services in Italy) should fulfil this demand.

Table 15 - *Introduction of technological innovations in information and communication technologies*

	n. of enterprises	1 = (2+3) % of enterprises with information technology innovations	2 % of enterprises with exclusively information technology innovations	3 % of enterprises with information technology innovations and other technologies	4 % of enterprises with communication technology innovations	5 = (3+4) % of enterprises with information and communication technology innovations
Sectors						
Vehicle retailers	369	91.9%	33.9%	58.0%	45.5%	43.9%
Wholesale trade	1,562	82.7%	31.6%	51.1%	43.6%	39.8%
Retail trade	507	89.3%	49.1%	40.2%	35.3%	33.3%
Restaurants and hotels	428	74.5%	43.5%	31.1%	22.9%	18.0%
Road and rail transport	450	61.6%	15.6%	46.0%	53.3%	36.7%
Sea transport	39	84.6%	5.1%	79.5%	76.9%	76.9%
Air transport	23	87.0%	30.4%	56.5%	56.5%	56.5%
Activities auxiliary to transport	348	73.3%	42.0%	31.3%	29.3%	26.4%
Postal service and telecommunications	6	66.7%	33.3%	33.3%	50.0%	33.3%
Monetary and financial intermediation	567	95.4%	41.4%	54.0%	51.3%	51.3%
Insurance companies	99	96.0%	38.4%	57.6%	50.5%	50.5%
Activities auxiliary to financial intermediation.	100	100.0%	49.0%	51.0%	51.0%	51.0%
Renting of equipment	4	75.0%	-	75.0%	75.0%	75.0%
Information technology services	528	90.9%	42.2%	48.7%	47.0%	45.5%
Research and development	65	50.8%	23.1%	27.7%	13.8%	13.8%
Other professional and business activities.	810	81.7%	31.2%	50.5%	39.4%	38.1%
Waste disposal	71	33.8%	5.6%	28.2%	11.3%	5.6%
Total	**5,976**	**82.4%**	**35.1%**	**47.4%**	**41.7%**	**38.3%**
Employed class						
20-49	3,603	81.0%	37.5%	43.5%	36.0%	32.4%
50-99	1,097	79.3%	32.0%	47.3%	50.8%	45.8%
100-199	549	86.9%	28.6%	58.3%	46.4%	44.1%
200-499	418	87.8%	35.4%	52.4%	48.1%	46.9%
500-999	155	95.5%	29.7%	65.8%	60.0%	60.0%
1,000 and over	154	94.8%	28.6%	66.2%	57.8%	57.1%
Total	**5,976**	**82.4%**	**35.1%**	**47.4%**	**41.7%**	**38.3%**

Note: Total may be differ from the sum of figures in the table owing to rounding required to refer data to total population

Source: *ISTAT innovation on services industries survey*

Table 16 – *Total expenditure for innovation technology in 1995 and share for the purchase of software*

	n. of enterprises	Software expenditure (million of lira)	% of software expenditure on total expenditure	Total expenditure for innovation technology (million of lira)
Sectors (1)				
Vehicle retailers	288	20,093	39.1%	51,368
Wholesale trade	1,219	120,068	18.4%	654,221
Retail trade	352	28,617	22.0%	129,986
Restaurants and hotels	289	12,398	25.3%	48,991
Road and rail transport	346	19,975	2.1%	947,797
Sea transport	35	1,180	5.0%	23,722
Air transport	20	15,426	27.1%	56,837
Activities auxiliary to transport	286	30,127	19.6%	153,624
Postal service and telecommunications	5	59,953	5.4%	1,102,058
Monetary and financial intermediation	410	440,759	36.6%	1,206,019
Insurance companies	81	52,454	29.0%	180,727
Activities auxiliary to financial intermediation.	90	17,276	39.2%	44,077
Information technology services	409	80,928	12.8%	631,393
Research and development	45	10,168	1.0%	982,482
Other professional and business activities.	614	72,743	12.2%	597,022
Waste disposal	53	1,705	1.5%	111,099
Total	**4,544**	**983,870**	**14.2%**	**6,921,423**
Employed class				
20-49	2,723	154,463	17.5%	884,077
50-99	817	106,997	25.4%	420,618
100-199	459	78,922	17.8%	444,043
200-499	308	75,179	8.5%	888,859
500-999	121	61,146	8.8%	692226
1,000 and over	118	507,163	14.1%	3,591,600
Total	**4,546**	**983,870**	**14.2%**	**6,921,423**

(1) Renting of equipment was not included because only data on less then 3 enterprises were available

Note: Total may be differ from the sum of figures in the table owing to rounding required to refer data to total population

Source: *ISTAT innovation on services industries survey*

3. Methodological problems, use of classifications, gaps: conclusions and questions

It is more and more necessary to develop a statistical scenario suitable to analyse sectors related to ICT and to the “information economy". Great efforts are expected from States, in a period in which resources for statistics are scarce.

1. The definitions adopted affect results obtained from the aggregation of data, as shown in the paragraph 2. content industries represent an important quota. Moreover, new multimedia industries imply that the ICT sectors and content industries should be jointly analysed to understand the on-going convergence processes.

2. The revision of the basic notions of enterprise and household in post-tertiary economy (this difference is fading), the development of non-profit voluntary organisations, the less pressing division between public and private, tertiarisation of enterprises ownership (for example dummy

companies) and the classification of multinational activities are general aspects which we have to take in consideration, as well as specific problems related to these sectors .
The whole economic and social system is to be considered from a different point of view since the introduction of new technologies has a number of positive effects. In fact the widespread application of innovative technologies allows to increase productivity, to offer different products and in the long run to increase employment.
To gasped these phenomena by the introduction of new technologies, and in particular of new telematics innovations, a revision of the current notions of **statistical units** (the notion of enterprise is not always useful in current analyses) and of current nomenclatures (multimedia is a very good example) is urged. Thus, the exam should focus attention on industries serving similar purposes and functions, without taking into account the specific production or distribution process or provision of service. New concept for analysis are to be used, such as the notions of integrated productive processes and convergence of different sectors. The group of enterprise should be more useful of the sole enterprise. These new statistical units should be used to study industrial synergies, the possibility of offering a wider selection of different products, new types of competition and alliance of goods providers and service providers for the ICT market.

3. The analysis of national statistical sources showed **gaps** to be filled for a complete study of the following elements: production and distribution of goods and services, investments, innovations, profit margins, labour market, and in particular:

- innovations in industry due to the introduction of information and communication technology has to be closely analysed. The ISTAT survey on innovation in services is not complete, despite giving interesting cues. The new communication nets at national, regional and world-wide level created by the Internet offer more opportunities to exchange a greater number of new and traditional financial, technical and professional services, favouring global economy. There are a lot of common elements between these topics and the analysis of service demand from industries which is discussed in session 5 of the Voorburg Group meeting. Surveys on technological innovations and on research and development offer a lot of useful data, but a sort of "fine tuning" is needed to analyses those aspects of innovation resulting from the wide use of information and communication technologies in all productive sectors and not only in the ICT sectors.
- specific sources do not cover completely the ICT sector and information technology industries, in fact the manufacturing sector is almost "neglected"
- the structural variables of enterprises can be re-constructed using "non specific" surveys carried out in each national economic sector (such as the SCI and PMI surveys on business balance sheet), but it would be advisable to develop specific survey to analyse in more dept these new phenomena. The ICT represents the driving element in the globalisation of industries and services and for the related re-structuring of industrialised country economy. ICT is laying down the foundations for new markets, and all commercial activities would be affected by the new opportunities provided by electronic commerce. New opportunities are often recorded under multimedia and the traditional division between manufacturing and services is cancelled.
- current surveys to analyse employment and education should be more specifically adjusted, in fact finer analyses are not possible since the actual data aggregation is not sufficient. The new organisation of employment resulting from the introduction of ICT is not surveyed enough. New jobs will be created, even though, in the short-term a reduction in employment could be necessary. Employment would feature more and more self-employment, mobility, part-time, not to mention temporary employment, the fast going out-of-date of specialisation, and the introduction of teleworking; these are some of the characteristic features of Information Society. The Italian intermediate census undergoing is an attempt to fill some of these gaps.

4. The methodological problem of **integrating different statistical sources** is still to be solved. The different source are characterised by different methods and coverage. Variables are not always defined in the same way. The integration of different sources implies the following problems: accuracy, namely precision in reflecting the observed phenomena, completeness, that is satisfactory coverage of the observed phenomena, consistency, in other words coherence among similar information from different sources, time delay in processing and disseminating data. Thus specific methodologies should be implemented to solve these problems. In this way statistics would not be a burden for respondents.

5. Current **classifications (**ISIC-NACE-ATECO**)** do not reflect the integration processes that took place in the examined sectors, multimedia is a meaningful example. The US NAICS classification is an attempt to solve these problems, however experiments are still at an initial phase. Classifications by products (CPC-CPA) are still being developed.

6. ISTAT aims to reduce the number of new surveys and the burden of statistics on respondents, while new methods to integrate different sources, both administrative and statistical are being developed. A project was added to other ISTAT programmes. This project aims to analyse statistical sources to effectively organise economy and to develop the compendium on information society at Community level. This project would direct more and more towards the analysis of on-going phenomena. On the other hand, national institutions dealing with these sectors are improving their level of collaboration.

Questions:

1. Do all the Countries agree with definitions adopted by OCSE?
2. Statistical units should be revised. What is the role performed by non-profit sectors (public and private) in supplying goods and services? What is the role of a group of enterprises?
3. The convergence of these sectors and the related challenges are of paramount importance in the analysis of the future development of these sectors. Are statistical systems sufficiently developed for these analyses?

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Appendix 1 – Classifications and definitions

ICT sectors			
ISIC REV_3		**NACE Rev.1 - *ATECO91***	
Manufacturing industry		***Manufacturing industry***	
3000	Manufacture of office, accounting and computing machinery	30.00	Manufacture of office, accounting and computing machinery
3130	Manufacture of insulated wire and cable	31.30	Manufacture of insulated wire and cable
3210	Manufacture of electronic valves and tubes and other electronic components	32.10	Manufacture of electronic valves and tubes and other electronic components
3220	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	32.20	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy
		32.20.1	*Manufacture and assembling of Radio-TV transmitters (videocams and audio electrical apparatus are included)*
		32.20.2	*Manufacture of electrical and electronic apparatus for telecommunications (Assembling is included)*
		32.20.3	*Repairing of radio-TV, acoustic amplification, electrical and electronic apparatus*
3230	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus, and associated goods	32.30	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus, and associated goods
3312	Manufact. of instrum. and appliances for measuring, checking, testing and other purposes, exc. Industrial process control equip.	33.20	Manufacture of instrum. and appliances for measuring, checking, testing and other purposes, exc. industrial process control equipment
		33.20.1	*Manufacture of electrical and electronic instruments for measuring*
		33.20.2	*Manufacture of meters for gas, water and other liquids and of instruments for measuring, control and tuning*
		33.20.3	*Manufacture of instruments for navigation, hydrology, geophysics and meteorology*
		33.20.4	*Manufacture of instrum. For design, calculation, dimension and precision; of precision and analytical balances, of instrum. for laboratory and for educational material*
		33.20.5	*Repairing of scientific and precision instruments*
3313	Manufacture of industrial process control equipment	33.30	Manufacture of industrial process control equipment
Services – good related		***Services - good related***	
5150	Wholesale of machinery, equipment and supplies **(1)**	51.43p	Wholesale of household appliance, audio apparatus, television
		51.43.2	*Wholesale of radiotelevision apparatus*
		51.43.3	*Wholesale of audio, video and informatic supports (disc, tapes, other supports)*
		51.43.4	*Wholesale of radioelectric, telephonic and televisional material*
		51.43.5	*Wholesale of apparatus for illumination and other electrical material*
		51.43.6	*Wholesale not specialised of household appliance, radio apparatus, television, radioelectric, telephonic and televisional material, apparatus for illumination and other electric material*
		51.64	Wholesale of office equipment and machinery
		51.64.1	*Wholesale of typewriters and calculation equipment*

		51.64.2	*Wholesale of office equipment excl. Furniture*
		51.65	Wholesale of other machinery for industry, trade and navigation
7123	Renting of office machinery and equipment (including computers)	71.33	Renting of office machinery and equipment (including computers)
Services – intangible		***Services – intangible***	
6420	Telecommunications **(2)**	64.20	Telecommunications
		92.20	*Radio and television activities* **(2)**
7200	Computer and related activities	72.00	Computer and related activities
		72.10	Hardware consultancy
		72.20	Software consultancy and supply
		72.30	Data processing
		72.40	Database activities
		72.50	Maintenance and repair of office, accounting and computing machinery
		72.60	Other computer related activities
		72.60.1	*Services of telematics, robotics and eidomatics*
		72.60.2	*Other services related to informatics*

(1) Where available, countries should only include those subsectors of this industry that directly provide ICT wholesaling services. This will avoid the inclusion of extraneous wholesaling activity. For example, using the NACE nomenclature, only NACE categories 5143, 5164, 5165 should be included.

(2) In those instances where countries include telecommunication activities as part of radio and television activities (ISIC 9213), radio and television activities (9213) should be included in this definition. Otherwise, it should not be included.

ISIC_Rev.3 class 5233 (Retail sale of household appliances, articles and equipment) was excluded because the classification was felt to be inaccurate for the purpose intended. The same argument applied to wholesale trade but it possible there to offer guidelines for more precise reporting using NACE (see note 1)

Criteria for inclusion of manufacturing and service industries in the ICT sector should be as below:

Manufacturing

the products of a candidate industry must:

- be intended to fulfil the function of information processing and communication including transmission and display

or

- use electronic processing to detect, measure and/or record physical phenomena, or to control a physical process;

Components primarily intended for use in such products are also included

Services

the products of a candidate industry must:

- be intended to enable the function of information processing and communication by electronic means

Industries related to content			
ISIC REV_3		**NACE Rev. 1 - *ATECO91***	
2211 [(a)]	Publishing of books, brochures, musical books and other publications	22.11	Publishing of books, brochures, musical books and other publications
2212 [(a)]	Publishing of newspapers, journals and periodicals	22.12	Publishing of newspapers
		22.13	Publishing of journals and periodicals
2213 [(b)]	Publishing of recorded media	22.14	Publishing of recorded media
2219 [(a)]	Other publishing	22.15	Other publishing
2230 [(b)]	Reproduction of recorded media	22.3	Reproduction of recorded media
		22.31	Reproduction of recorded audio media
		22.32	Reproduction of recorded video media
		22.33	Reproduction of recorded informatics media
9211 [(a)]	Motion picture and video production and distribution	92.11	Motion picture and video production
		92.12	Motion picture and video distribution
		92.13	Projection of video and motion picture
9213 [(b)]	Radio and television activities	92.20	Radio and television activities
9220 [(a)]	News agency activities	92.40	News agency activities
9231 [(a)]	Library and archives activities	92.51	Library and archives activities

(a) Not in ICT industry
(b) Partly relevant to ICT

Definition of *Information Content Industries*

Those businesses associated with the provision of information either directly to consumers or through some intermediary who transforms that information into some other medium. The set of industries is therefore made up of the traditional media businesses, such as newspapers and radio and television broadcasters along with elements of the cultural industries which provide the raw material input to the media for delivery; it also includes libraries.

Appendix 2 – Italian statistical sources for information society compendium

	ISTAT Sources		Other National Sources	
VARIABLES	**Specific**	**Non Specific**	**Public**	**Private**
Introduction			AIPA	AIIP, ALCHERA, ANASIN, ANEE, ANIE, ANUIT, ASSINFORM, ASSINTEL, CSELT, FEDERINFORMATICA, FRT, FTI, IPO, SDA Bocconi
Value added		SME survey, SCI survey, Intermediate Census (1997) National Account (more aggregate industries)		
Employment	IT survey, Audiov. Survey	" and Labour force survey		
Trade (imports, exports)	Audiov survey	SME survey, SCI survey, Intermediate Census		
Consumption of ICT goods and services		Households consumption survey, National Accounts (more aggregate industries), Intermediate Census	AIPA	
Penetration of ICT goods and services	IT survey, IP survey, Audiovisual project	SME survey, Multipurpose survey Intermediate Census	AIPA	
Infrastructure	Audiovisual project, Telecom project			
Enterprises				
Number of enterprises	IT survey, IP survey, Audiov survey	Business Register, SME survey, SCI survey, Intermediate census		
Number of lacal unit		"		
Size classes	"	"		
Legal forms	"	"		
Affiliation		"		
Foreign ownership	IT survey	"		
Receipts and expenditures	IT survey, IP survey, Audiov survey	"		
Profitability		SME survey, SCI survey, Intermediate Census		
Value added	IT survey, Audiov survey	" and National account (more aggregate industries)		
GDP		National accounts (more aggregate industries)		
Taxes paid		SME survey, SCI survey, Intermediate Census		
Investments	IT survey, Audiov survey	"		
Employment (total worked hours)	"	"		
Production of ICT goods and services	IT survey, IP survey, Audiov survey	"		
Exports (origin and destination)	Audiov survey	"		
Imports (origin and destination)	Audiov survey	"		
Distributive trade in ICT goods and services				
Employment in information occupations				
Employees per occupation/per industry (2,3 digits)	IT survey	SME survey, SCI survey, Labour Force survey (2 digits), Intermediate Census		
Occupation in ICT sector		Labour Force survey (2 digits)		

Organisation of work				
New form of occupations				
Education				
Number of degrees		Education survey, Labour force survey		
Type of education by sector	IT survey	"		
Attainment level by sector				
Vocational and adult training		Vocational and Adult Training survey		
Technological change				
R&D in ICT sector: money		R&D survey, Innovation on manufacturing sector survey, Innovation on services sector survey		
R&D in ICT sector :labour		R&D survey		
Third party for R&D		"		
Number of patents				IPO
Royalties				
Pricing and wages				
Consumer prices: fixed, usage, peak hours, off peak hours		Consumer prices survey (not all goods and services of ICT)		
Producer prices				
National currencies (ECUs, PPP prices)		National accounts (more aggregate level)		
Wages		Labour cost survey		
Cost of internet access	IP survey			
Use of information technology and ICT products				
Use of ICT by households	IT survey	Multipurpose survey		
Use of ICT by individuals				
Use of ICT by enterprises	IT survey	SME survey, Intermediate Census		
Use of ICT by public sector	IT survey		AIPA	
Use of ICT by other organisations				
Use of ICT in the home		Multipurpose survey		
Use of ICT at work		"		
Use of ICT at leisure time		"		
Use by gender		"		
Use by region		"		
Use by age		"		
Purpose of the use of ICT				

LEGENDA	
SME Survey	*small and medium size enterprises (less then 20 employed)*
SCI Survey	*big size enterprises (equal and more then 20 employed)*
IT Survey	*Information Technology survey (all size employed)*
Audiovisual Survey	*pilot survey for 1992 year (all size employed)*
IP Survey	*Internet Providers survey for 1997 year*
Multipurpose Survey	*(use of time) on households from 1995*
Telecommunication Project	*analysis of data from "specific" survey and other statistical sources*
Audiovisual Project	*analysis of data from "specific" survey and other statistical sources*
AIIP	*Italian Association of Internet Providers*
AIPA	*National Authority for Information Technology in the Government*
ALCHERA Strategic Vision	*Observatory - Hi Tech Monitor*
ANASIN	*National Association of Telematics and Computer Science Enterprises*
ANEE	*National Association of electronic editory*
ANIE	*Italian Federation of Electrotechnical and Electronics Industries*
ANUIT	*Italian Telecommunications Users Association*
ASSINFORM	*Italian Information Communication Technology Companies Association*
ASSINTEL	*Italian Association of Information Technology Companies*
CSELT	*Society of research and laboratories of telecommunication*
FEDERINFORMATICA	*Italian Federation od Organisations of Information and Communication Technology*
FRT	*Radio Televisions Federation*
FTI	*Forum on Information Technology*
IPO	*Italian Patent Office*
SDA Bocconi	*Observatory on Internet of Bocconi University*