STATISTICS FOR THE INFORMATION SOCIETY
PERSPECTIVES FOR THE FUTURE

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1. Abstract

The term Information Society is used to contrast the characteristics of the now emerging Society to those of the Industrial Society and even the Agricultural Society and signifies the new Society in all its aspects. Statistics for the Information Society is thus a global term that might comprise all sorts of statistics: economic, social, environmental, cultural etc. In order to conceptualise a manageable project and work programme it is necessary to define the term and focus on some of the possible aspects of Statistics for the Information Society.

The purpose of this paper is to put forward some ideas and suggestions concerning the development of Statistics for the Information Society. Against a background of Europe's way into the Information Society, some general conclusions are drawn concerning the consequences for the statistics. Then a framework structure for statistics in this area is presented.

The information society will be realised via social and economic networks using telecommunication networks or infrastructure. Telecommunications infrastructure is essential as the basic foundation of the information society. Annex 1 describes Telecommunications Services Statistics: the **COINS** project.

It is obvious that for many analytical purposes it is not sufficient to use data only concerning the Telecommunication and Computer Services. To formulate, monitor and evaluate policies, to assess the market, for investment decisions etc. it is often necessary to place these services in a broader context, i.e. to take related industries into account.

The Content Industry is an often used expression in this context. This industry is not well defined, but there exist general consensus on the elements. Audio-visual Services are perhaps the most important of these industries. This has been recognised by Eurostat by establishing a project on Audio-visual Services, the **AUVIS** project.

The aim of this paper is to stimulate a discussion with concerned parties of how the statistics for the Information Society best should be developed. The result should be a Work Programme for development of the statistics in this sphere.

2. Political background

2.a Europe way into the information society

Some of the milestones on Europe's way into the Information Society are:

- The Maastricht Treaty, where article 129b stipulates that the European Community shall

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contribute to the establishment and development of trans-European networks in the areas of transport, telecommunications and energy infrastructures. 1992.

- The <u>White Paper</u> "Growth, Competitiveness. Employment. The Challenges and Ways Forward into the 21st Century". 1993.

- Europe and the global information society. <u>Recommendations</u> to the European Council. The "Bangemann Report". 1994.

- Europe's Way into the Information Society. <u>An Action Plan</u>. 1994.

- Draft Green Paper "People First: Living and working in the Information Society

- <u>G7</u> Information Society Conference. 1995.

- <u>EU/CEEC Fora</u> on the Information Society

2.b. OECD workshops on the economics of the information society

OECD has launched a series of Workshops on the Economics of the Information Society. These Workshops are aimed at developing data, research and analysis under the ægis and direction of the Committee for Information, Computer and Communications Policy (ICCP) as a precursor for policy discussion within the Committee.

3. The Information Society

A conclusion of the G-7 Ministerial Conference on the Information Society in Brussels in February 1995 was that "progress in information technologies and communication is changing the way we live: How we work and do business, how we educate our children, study and do research, train ourselves, and how we are entertained. The information society is not only affecting the way people interact but it is also requiring the traditional organisational structures to be more flexible, more participatory and more decentralised".

The industrial development means that the use of information and knowledge as a basis for industrial activities and production becomes more and more dominant at the expense of the use of energy and manufacturing machinery. The modern industrial enterprise is to a great extent a producer of services integrated in the product. The larger part of this production of services concerns the use of information in some form. The new developments in the information economy and technology lead i.a. to increased possibilities to commercialise earlier ancillary services.

According to studies collecting and processing information and transforming it into

know-how and competence take more resources in the modern enterprise than the actual manufacturing. One problem is that knowledge and competence is connected to the people in the organisation rather than to the organisation - enterprise or administration - itself.

New information and communication technologies influence the ways people interact and thus also changes the organisation of production. Globalisation, deliveries of systems rather than products, virtual enterprises, delocalisation, outsourcing, the borders between the producer and the customer are becoming less distinct.

One of the basic characteristics of the gradual growing of the Information Society is that an ever increasing part of the life, society and population concerns abstract things rather than concrete. This implies that much of old knowledge and competence becomes obsolete and that new knowledge and competence is required.

The Information Society is also the Services Society. The Services sector has become more and more dominant on the macro-economic level. But also on the micro-economic level the
information society is increasingly predominant.

The Information Society will be realised via social and economic networks using telecommunication networks or infrastructure. Telecommunications infrastructure is essential as the basic foundation of the information society.

Annex 1 describes Telecommunications Services Statistics

4. The Networked Economy

The networked economy is nothing new. The self-supporting agricultural economy could perhaps be regarded as a non-networked economy. But as soon as one started selling goods and services on a market, to create professions and guilds etc. the networks were already being set up. The industrialisation process based on technological development was partly a process of specialisation and division of labour, i.e. building new networks, and partly the creation of new products and services made possible because of new technology. What is new is the effective support that the new technologies and the telecommunications networks offer.

The networks have always strongly influenced the economic and social reality, urbanisation
patterns and power centres. The rise and fall of towns and regions has throughout the centuries been determined by developments in transport technologies: roman roads, shipping, railways. The balance between the need for closeness to raw materials or closeness to the market has changed.

The social and organisational networks are still the decisive factor. The technology is a means that increases the possibilities for a "free choice" when developing the networks. High tech production is often localised near universities and the R&D activities of enterprises are often localised to places far away from the headquarters or the manufacturing sites like Silicon Valley, Sophia Antipolis, "creative villages".

In the context of the information society one of course has to have access to the telecommunication network to be a part of the Information Network but also to have access to the economic and social network. One can distinguish between two kinds of economic and social networks: networks consisting of enterprises/administrations, i.e. organisations, and of persons.

Against this background it is possible to distinguish some main factors or trends that will have a great impact on the Information Society and Economy and thus indicate some of the needs for development of the statistics.

- The <u>relocalisation</u> of activities made possible by the telecommunications networks. Networking has two directions. It can mean a decentralisation of activities but also a centralisation. A centralisation through specialisation and concentration of different functions in an organisation or through use of IC technology for remote inspection, control and regulating of e.g. electricity generating plants and distribution networks. A decentralisation through teleworking and distance learning or localisation of routine work, like booking and ordering systems, to areas with cheap labour. The <u>regional aspect</u> is important. A future dividing line in the society might be between those who can choose where to work and those who are given the place where to work.

- In the information and knowledge based society <u>new knowledge and competence</u> will be
  required and old will become obsolete. The new jobs created will not automatically be
  acquired by those who lose the old ones. The training, education, competence and professions of the <u>human resources</u> will be crucial for the development.

- <u>Mobile communications</u> can be foreseen to have profound implications for how people interact and arrange their lives at work or at leisure.

- The increased <u>flexibility</u> made possible through the (mobile) communications networks will probably make the distinction between working time and free time less sharp and more flexible. Also the place where to work will be more variable. The opportunities to take full advantage of the possibilities the new IC technologies offer are not evenly distributed among the population.

- <u>New ways of organising</u> enterprises and production, like outsourcing, systems deliveries,
  "virtual" enterprises etc., will emerge and become ordinary. It will be more and more

common that small and medium sized enterprises (SME) will be linked together in networks. In this way it is possible to form for each task or project the best combination of competence and capacity.

5. Statistics for the Information Society

Statistical frame of reference

From the short overview given above some conclusions can be drawn concerning the direction in which statistics for the information society should be developed.

Services and information in different forms takes an increasing share of the economy, both on the market and internal in the enterprises. Production and use of immaterials is more and more
important in relation to material products. The increased mobility, flexibility and variations made possible by the successive development and implementation of IC technologies must be taken into account in the statistical systems.

The concepts we use determine our understanding of the economy and the society and our ability to create new knowledge. Our perception of the reality, how we describe it and how we formulate the problems is important for policy and decision makers. For example, politicians and others did not see unemployment as a problem until the concept of unemployment was created at the turn of the century - a consequence of the industrialisation and the urbanisation process. Before unemployed people were described as vagabonds, lazybones, good-for-nothings or other words to that effect.

In short, the production in the Agricultural and Industrial societies and economies is stationary and the products material. In the Information society and the networked service economy the
production is mobile and the products immaterial. The problem when trying to understand the
networked economy and the transformation into the information society is that economic statistics are based on concepts, definitions, theories whose frame of reference is the agricultural and industrial society and economy.

In The Knowledge Based Information Economy[1] it is said that

"Production technology is increasingly moving economic activities across the statistical

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[1] G. Elliasson, S. Fölster, T. Lindberg, T. Pousette, E. Taymaz: The Knowledge Based Information Economy.   The Industrial Institute for Economic and Social Research. Stockholm 1990.

categories we have become accustomed to. The economist's representation of a nation - a statistical system interacting with the statistical systems of other nations, each being autonomously controlled by a political authority - is being gradually diffused through the international integration of markets and the increasing presence of multinational corporation. Thus, we are measuring less and less well what is becoming economically more and more important.

We lack the measurement system needed to capture an advanced market economy in operation, because we lack the adequate guiding theory".

In the "Crystal Ball"[2] it is pointed out that

"Certainly the tools at our disposal today, such as activity and product nomenclatures or registers and statistical units, are not adequate for investigating services phenomena because they have been forged to serve national purposes in a manufacture based economy".

and

"The globalisation of the economy and the new organisation of business at world level, the European single market, NAFTA, GATS are transforming the structures of enterprises and relation between them.

Externalisation of services production will be less and less limited by space. Production is not anymore a national concept".

Therefore it is important to put much effort towards development of the statistical frame of reference, i.e. the concepts, definitions, variables, data collection and survey systems etc., necessary to study and understand the information society. This should be done with an international perspective so that the statistics will be internationally or globally comparable.

The existing economic statistics are basically supply or production oriented. For example, cars produced and sold are counted and the number makes sense. To count pieces of produced information would not make very much sense.

The reason is that, in spite of numerous varieties of cars, a car is a reasonably well-known concept with a known general function or use. A piece of information could be anything. One has to add information on the subject and usage or application to give meaning to the "piece of information"
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Another difference between information and material products is that information can be used by many at the same time in different places independently of each other. The

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[2] Photis Nanopoulos, Marco Lancetti: Expected changes in Services Statistics: a look into the "Crystal Ball";   document presented to the tenth meeting of the Voorburg Group on Service Statistics; Voorburg 1995.

information is not consumed or worn by usage. It's depreciation depends on other factors.

This is of course a simplified description, but it serves to illustrate that the statistics for the information society should focus more on the demand or use side than the present economic statistics do. The statistical balance between the production and the use sides should be improved.

It is difficult to see what is really happening in a process of development and change when one self is taking part in it. In retrospection it is easier. It is important to have different time perspectives in mind when analysing and trying to understand the way into the Information Society. On the one hand, the present state of the arts determining today and the near future's economic and social development and on the other hand the future, which can be imagined in avant-garde applications and forecasts, but often is unforeseeable.

Studies of the diffusion and acceptance of innovations etc. show that it often takes decades before today's available best technology has become the commonly used, normal, technology depending on social and economic factors. As was noticed in an OECD report some years ago: Technological development and change is a social process.

The implication for the statistics for the Information Society is that it should be designed to describe the "bulk information" and "grey" everyday telecommunications services and applications, which probably count for the predominant part of the economy. This should not be allowed to be concealed by the latest exciting technological developments.

Related industries

As already said, the information society will be realised via social and economic networks using telecommunication networks or infrastructure. Telecommunications infrastructure is essential as the basic foundation of the information society (see annex 1).

It is obvious that for many analytical purposes it is not sufficient to use data only concerning the Telecommunication and Computer Services. To formulate, monitor and evaluate policies, to assess the market, for investment decisions etc. it is often necessary to place these services in a broader context, i.e. to take related industries into account.

The Content Industry is an often used expression in this context. This industry is not well defined, but there exist general consensus on the elements.

Audio-visual Services are perhaps the most important of these industries. This has been recognised by Eurostat by establishing a project on Audio-visual Services, the **AUVIS project.**
Other Content Industries are e.g. On-line Databases, Software providers, Information providers from different areas. **Multimedia** is a central concept in this area.

Other industries of relevance are e.g. manufacturing of telecommunication and computer equipment and consumer electronics.

Converging industries

The technological, regulatory and commercial developments are leading to a growing convergence of the telecommunications services, computer and related services and broadcasting industries. This means that it will be increasingly difficult to assess these industries on the basis of industrial statistics.
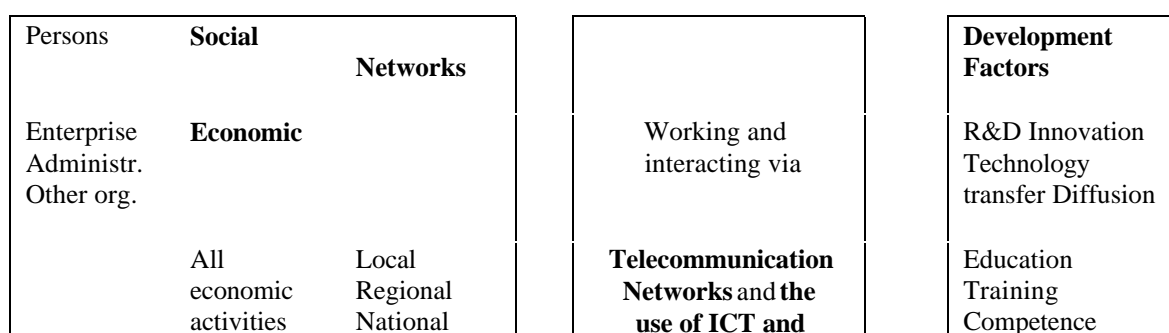
What the relevant delimitation of the industry should be varies with the analysis that is to be made or the question to be answered. Difficulties will always exist due to restructuring of the society, industries and economic activities. The solution seems to be found in creating appropriate "statistical building blocks" that can be used in different combinations for different purposes. The way to do this is to improve our categorisation and definitions of the services or information products.

If the appropriate data are collected on products as well as on industries it is possible to create a matrix. From this matrix the relevant cells can be chosen for each analytical purpose or publication. It is important to make a clear distinction between the collection of data and the analysis and publication of statistics.

Networks

Against the outlined background and with Enterprise and Services Statistics and the European System of Accounts (ESA) as the underlying frame of reference, the conclusion is that Statistics for the Information Society should focus on Networks, the Services that make it possible to reap the benefits from them and Development Factors.

This can be illustrated with the following picture. It should be noted that the two boxes Telecommunication Networks etc. and Development Factors are themselves also parts of the
general Social and Economic Networks.

Persons	**Social**				
		Networks			
Enterprise Administr. Other org.	**Economic**		Working and interacting via		R&D Innovation Technology transfer Diffusion
	All economic activities	Local Regional National	**Telecommunication Networks** and **the use of ICT and**		Education Training Competence

Development Factors

Global	**Information**	Legal and Institutional conditions

GDP; EMPLOYMENT; COMPETITIVENESS; ECONOMIC GROWTH. ORGANISATIONAL, SOCIAL, CULTURAL , ENVIRONMENTAL IMPACT

To understand the effects on GDP and Employment etc. new theories have to be developed. Developing the data collection and statistics is an iterative process related to the development of theories and models. It is necessary to have access to both macro economic and micro economic data and statistics as well as case studies.

Satellite accounts

In the Crystal ball it is pointed out[3]

"The SNA (System of National Account) recognises the difficulties of obtaining information about the role of ancillary activities in the economy system, "as the existence of ancillary activities is not explicitly recognised in the System".

"This may be regarded as a serious disadvantage for certain purposes such as analysing the impact of "information technology" on productivity when the processing and communication of information are typical ancillary activities (.....).

We think that in spite of the difficulties recalled by the SNA, statisticians if they do not want to be left behind the economic and organisational reality, have to find solutions to this problem by establishing adequate methodologies of statistical analysis based on the assumption that the expected changes in statistical record keeping could reduce the response burden to a sustainable one."

The strategy for the development of Statistics for the Information Society is to build on existing statistics and statistical systems; to adapt and develop them and to build separate satellite accounts to the ESA.

The satellite accounts make it possible to link statistics in non-monetary terms to the standard national accounts framework, because as far as possible the basic concepts and classifications of the standard framework are retained in the satellite accounts. In this way, a consistent extended framework is built, which can be used for analysis and evaluation of all kinds of interaction between the variables in the standard framework and in the satellite accounts.

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[3] Photis Nanopoulos, Marco Lancetti: Expected changes in Services Statistics: a look into the "Crystal Ball";   document presented to the tenth meeting of the Voorburg Group on Service Statistics; Voorburg 1995.

The satellite accounts serve the data needs by:

- showing more detail where necessary

- enlarging the scope of the accounting framework by adding non-monetary information

- changing some basic concepts, e.g. by enlarging the concept of capital formation by amount of expenditure on research and development or the expenditure on education and creation of competence.

Four aspects of interest

To help translate this picture of the Networks and the Information Society into manageable statistical terms and to help understand the effects and impacts on GDP and Employment etc. four main aspects of interest have been identified.

1. The Telecommunication Networks or Infrastructure as such. These give the possibilities and sets the limits for the potential of the Telecommunications Services in the economy. Availability of Telecommunication Infrastructure is important from many policy relevant aspects: social, regional, cultural etc.

2. The ICT Industry itself, i.e. the producers or suppliers of Telecommunications Services. This industry's importance in the overall economy, competitiveness, growth, structure and employment.

3. The use of the Telecommunications Services, ICT and Information. The impact on the organisation and behaviour of enterprises, productivity and competitiveness in all economic sectors. The ICT Industry is itself one of the most intensive users.

4. The creation of new business opportunities, concepts and ideas - of new processes, goods and services through ICT and Information, i.e. the innovation and diffusion process in the society and economy.

Confidentiality a challenge

The liberalisation and deregulation of the telecommunication services markets opens up for competition. There is an obvious risk that the economic operators on the markets become more and more reluctant to submit statistical data over their activities. But at the same time as an operators does not want to give information on his activities, he himself needs information on the market to be able to make well-founded decisions.

For an effective and fair competition on the Internal Market and on the global markets the transparency of the markets should be increased. The small actors on the market has a

claim for "equal" information. Detailed information accessible to all players on the market on equal terms will benefit the market and those trying to enter it. At the same time the operators on the market have a just claim to keep sensitive business information secret.

It is therefore necessary to find a balance between the legitimate interests of the operators to protect their investments and strategy plans and the equally legitimate need to make it possible to get a clear picture of the development in this essential sector of the international as well as national economy.

There is a lack of common understanding of what should be confidential and a lack of awareness even among regulators about what kind of information should be available. It is crucial to reach an understanding between the different concerned parties on what statistical information should be provided and that all the operators contribute on equal terms.

6. Summary and proposed work programme

Summary

To summarise: some general directions in which the statistics for the Information Society should be developed are:

Enterprise statistics

- develop a taxonomy of enterprises and their different ways to interact
- improve the statistics coverage of small enterprises
- develop statistical concepts and categories for the enterprises internal economy and accounts that are reconcilable and compatible with the statistical concepts and categories that are used for the economy on the market. Bring statistical and accounting practices closer together.
- develop the definitions of the results from information activities - the information and services products.

Emphasis on the human resources

- employment
- training, education, skills, competence levels
- occupations, professions

Geographic localisation, concentration patterns

- enterprises: clustering of different economic activities; regional, national, global.
- persons: clustering of professions, competence etc.; regional, national, global.

Communication patterns

- telecommunications role in the total communications system and the interaction with other forms of persons, goods or messages communication.

Emphasis on use and demand

- enterprises: extent of use, costs, investments, different services and applications
- persons: extent of use, spending, different services and applications

Preliminary work programme

There is no doubt that to-day there is a fundamental shortage of data and statistics enabling us to understand and analyse the emerging Information Society and the Networked Economy.

With reference to the conceptual problems involved in the development of Statistics for the Information Society due to rapid technological and commercial changes and the lack of adequate economic theories, it is obvious that it will take time and effort to a statistical system, which makes adequate data and statistics for the information society available.

The normal situation in Member States is that there is a general shortage of good statistics on
services. In the case of Communication and Information Services, statistics are almost non-existent in the National Statistical Institutes.

On the other hand, it is clear that there exist to-day a lot of relevant data, mostly from unofficial sources. They are often produced by market research companies and consultants. These data are more or less well defined and more or less comparable over time and between countries. It is often neither clear what they cover nor how reliable they are. It is therefore not possible to bring together a consistent and coherent set of Statistics for the Information Society on the basis of these data.

But they exist and are used by administrations and operators on the markets. They should also be used and thereby evaluated in the process of developing and publishing adequate statistics.

The preliminary Action Programme for Statistics for the Information Society consists of the
following elements:

1. *increase the awareness* of Ministers, National Statistical Institutes, Regulatory Authorities and other concerned bodies in Member States on the need for statistical information and difficulties to obtain it;

2. ***research on concepts, definitions, variables, data collection and survey systems etc.***, necessary to understand the information society;

3. ***report on users need for information and establish a GUS*** (an internal at the Commission users' of Statistics group) for the Information Society to guide the development and if necessary, ***prepare a Council Decision*** on a Programme for Statistics for the Information Society.;

4. ***produce a comprehensive compendium*** of statistics in co-operation with concerned Commission Services and interested Members States by a more intensive ***use of existing data*** for publications addressing different themes;

5. ***pursue the launched COINS, AUVIS and Business Services projects*** comprising definitions, classifications and concepts; analysis of user needs; guidelines for data collection; methodological manuals; glossary; data base; dissemination;

6. ***establish a EU Statisticians Task force*** based on Finland and Scandinavian countries initiative;

7. ***assist on Statistical matters CEEC*** governments faced with the task of formulating their respective information society policies, in the context of the EU pre-accession strategy;

8. co-operate and co-ordinate with ***international organisations***, e.g. International Telecommunication Union (ITU) and OECD in order to promote the development of comparable international or global statistics.

Annex 1

Telecommunication Services Statistics: the COINS project.

Introduction

Eurostat has in partnership with Directorate-General XIII for Telecommunications, Information Market and Exploitation of Research launched a project (COINS) for developing Information and Communication Statistics. The target is to establish a basic set of reliable, comparable regular European statistics, that gives the main trends in the development. The statistics should be comparable between countries and over time. The need for more detailed data for analysis of special topics should be met by special surveys.

The European telecommunications market is a part of the global market. In the same way the
European telecommunication statistics have to be a part of the global telecommunication statistics, while at the same time be able to meet specific European statistical needs, e.g. concerning the internal market and regional policy. The telecommunication statistics has to fit into the general framework of enterprise and economic statistics as well as it must be consistent with the existing framework of international statistical agreements such as the System of National Accounts and the European Statistical Accounts.

A prerequisite for stable and reliable statistics on Telecommunications services, comparable
between countries and over time, is the existence of recognised concepts, definitions and classification systems. These should be applied in all stages of the statistical process, i.e. the data collection, processing, storing, presentation and analysis.

In order to ensure that the statistics will be comparable world-wide it is important with a close co-operation and harmonisation with other concerned international organisations like the International Telecommunications Union and OECD.

Compared with the common information area as given in the White paper the COINS project
comprises three of the six levels: the physical infrastructure, the basic telecommunications services and the users. The three levels not directly involved in the project are the information itself, the hardware, components and software and the applications. In addition to the levels indicated for the common information area, the COINS project encompass the producers of telecommunications services. So the four sub-sectors of the project are:

- Telecommunication Infrastructure
- Telecommunication Services Producers
- Telecommunication Services

- Telecommunication Services Users and Usage

Of the four main headings of the Action Plan for Europe's way to the Information Society the first "the regulatory and legal framework" is important for the definitions and categories to use and for the analysis of user needs. The second heading "networks, basic services, applications and contents" concerns all four sectors of the telecommunication statistics. Contents however is outside this project, but there is another Eurostat project for Audio-visual Services - AUVIS. The last two headings "social, societal and cultural aspects" and "promotion of the information society" has a direct bearing on the user and usage part of the project.

Domains of variables

The target for the COINS project is to establish a set of reliable, stable variables for the telecommunication services. These sets of variables should meet the basic needs for data and it should be possible to collect the data with good quality. The information should be possible to use as benchmark statistics when using information from other sources for analyses.

The policy domains which should be covered by variables are

1) Structural information on markets

Statistical variables and information:

a) about the economic weight of the sector within the total economy, particularly its productivity and its contribution to gross domestic product and national income, b) about concentration ratios in the sector, c) about the relevance of SMEs in the sector, d) about the relevance of public enterprises in the sector, e) about public subsidies or other public support of the sector.

2) Enterprise economic information

Statistical variables which give information a) about turnover, revenues, costs, value-added
investment, employment etc., b) about the portions of different service products of total sector
output.

3) Information on infrastructure

Statistical variables which give information a) about the physical capacity and performance of technical networks or other facilities, that are necessary for supplying several service products, and b) about the use of special technologies which are of key political interest.

4) Volume information relating to the supply side

Statistical variables which give information about the development of the output of the sector in "real" terms, i.e. in physical or performance parameters which are typically used in the sector.

5) Demand and usage information

Statistical variables which give information a) about the level of demand or use of the specific
service products - in value terms and/or in physical terms, b) about the relative portions of consumer and enterprise demand and use.

6) Quality of service performance information

Statistical variables which give information about the quality standard of the service products
  offered by the public and private enterprises of the sector.

7) Prices information

Prices and price indices for "typical" specific service products, defined by a commonly used volume indicator and a distinctive quality standard

8) International trade information

Statistical variables which give information about the international connections of the sector on the output side (product markets) as well as on the input side (factor markets).

Basic information from other domains, particularly macroeconomics and population figures, which facilitates an assessment of the relative position of the services in the economy and comparisons on national, European and international level will also be included.

Summary description of the Telecommunication Services Statistics

The following figure gives an overview of the sub-sectors and the domains of variables and their relations. The international trade information is not included in the figure. Such information might concern all four sub-sectors and presents many statistical problems. The results from on-going activities within the frame of the General Agreement on Trade in Services (GATS) and WTO are to be taken into account.

Telecommunication Networks * Infrastructure statistics		
Producers *- Network Operators* *- Services Providers* * Structural Indicators * Enterprise economic statistics	**Services** *- Transmission Services* *- Network Value Added* *Services* * Volume statistics * Quality statistics * Price information	**Users** *- Enterprises/* *Administrations* *- Persons* * Statistics on demand and usage

1. Statistics on Telecommunications Infrastructure

As has been said already the telecommunications infrastructure is the basic foundation of the information society. Information on the telecommunications networks - their capacity, characteristics, coverage of the countries and the populations, accessibility - is crucial for all actors in the field.

This is also the domain where traditionally the statistics have been best developed. Since long have the national operators published statistics on the networks and ITU published world-wide data. These data are e.g. on number of telephone main lines: analogue and digital, residential and business, on switching capacity, on subscribers of different services: mobile telephone, radio pager, leased lines, public data networks, ISDN, etc.

There is still need for the "old indicators" but due to technological and commercial developments there is also a need for new data, e.g. on transmission speed. It is important that the new definitions and specifications are developed so that they will be harmonised on the international level and thus comparable. One instrument for this is the ITU Telecommunication Indicator Handbook.

Traditionally the statistics on telecommunications have been about the public telecommunications sector. As is said in the ITU Indicator Handbook public telecommunications include telecommunication networks which consist of exchanges

(switches) linked by transmission circuits that connect subscribers to each other. Anyone can subscribe to the network: hence the term public which refers to the access arrangement rather than the ownership of the network. The public telecommunications sector does not include private networks that do not automatically connect to the public network or which have limitations on membership.

For the information society and the networked economy the private networks are important and their importance increases. Statistics on the private networks would therefore greatly increase the possibilities to describe and analyse the networked economy. Such statistics concern not only the networks but also the telecommunications services and usage.

2. Statistics on Telecommunications Services Producers

The telecommunications services sector is changing from a monopolistic situation to a competitive environment. The European market for all basic telecommunication services is to be opened up for competition the first of January 1998 at the latest, with delays allowed for Spain, Portugal, Ireland, Greece and Luxembourg.

With the markets opening up the number of enterprises, both operators and service providers, increases. In terms of classification of economic activities, these enterprises are classified to NACE Rev. 1 64.2. At present, enterprise statistics for the telecommunications services are very scarce at the European level.

One measure to improve the situation is to create the legal basis for European statistics. The

Commission has submitted a proposal for a Council Regulation concerning structural business statistics. Article 3 of this draft regulation says that the regulation relates to the compilation of statistics on a number of domains. Some of these domains are the structure of the activities, and their evolution, as well as the type of relations between businesses, the factors of production used and the regional, national, Community and international development of business and markets.

The statistics to be compiled are divided into two modules. One is a common module to be compiled annually for all services industries. These statistics comprise for example number of enterprises, turnover, production value, value added, personnel costs, purchases of goods and services, exports and imports of goods and services, number of persons employed.

The other is a detailed module for specific activities, e.g. statistics specifically related to telecommunications services. These modules have still to be developed.

To be able to describe and analyse the developments of the telecommunication services markets, it should be possible to split the revenues according to the different services

produced.

Eurostat intends to plan a pilot survey of the telecommunications services in order to test methodologies, concepts, definitions and the feasibility of data collection. The pilot survey should cover the proposal for classification of telecommunication services, number of enterprises, the control of and relations between enterprises, international trade and employment.

In the United Kingdom OFTEL has collected information on value added data and network services concerning the period 1 April 1994 to 31 March 1995. The experiences from this survey will be taken into account.

A statistical survey of the telecommunications services sector is currently being planned by Statistics Sweden. The object is to measure the production gross and net, export and import from the telecommunication services industry, production and trade with telecommunication services from neighbouring branches, employment and traffic volumes.

The results from the pilot study would be used as a basis for developing regular European enterprise statistics on telecommunication services.

3. Statistics on Telecommunications Services

A crucial element in the development of statistics on the telecommunication services is the definition of the services and the creation of a classification system. This classification system has to be defined so that it takes into account the rapid growth of new products and services, led by both the liberalisation and the technological evolution.

The Classification of Products according to Activity (CPA) is the European classification of the different products or services. The world-wide counterpart is the Central Product Classification (CPC). Eurostat has, in collaboration with DG XIII, elaborated a proposal for revising CPA.

The proposal is based on the recognition that the CPA, as given in the Council Regulation (EEC)3696/93 of 29 October 1993 on the statistical classification of products by activity (CPA) in the European Economic Community, does not reflect the increasing importance of mobile services and new services on the total market for Telecommunications Services.

The Eurostat/D4 aim is to structure the Telecommunications Services in such a way that the categories are broad enough to be more stable over time. At the same time the categories should correspond to relevant segments of the Telecommunications Services Market to make them useful for analysis.

The proposal consists of 7 categories and 30 sub-categories. The proposed seven categories in which the Telecommunications Services market is divided are:

- Fixed network telecommunication services   (10 sub-categories)
- Mobile telecommunication services   (8   "   )
- Interconnection services   (1   "   )
- Communications management services   (4   "   )
- Value added telecommunications network services (4   "   )
- Broadcast services   (2   "   )
- Radio and television cable services   (1   "   )

For the CPA to serve as a "central" product classification all the product classifications used in EU statistical inquiries or for special survey purposes have to be related to the CPA. Thus, either the CPA itself can serve as the classification used in inquiries or those classifications may be more detailed but strictly related to CPA.

Data on the telecommunication services should be collected from both the supply - the producers side and from the demand - the users side.

The telecommunications services as defined according to CPA should be covered by statistics on

Traffic/volumes. Traffic can be measured in different units (calls, minutes, pulses etc.); number
of telegrams and telex messages.

Price information. Installation, subscription and call or access etc. charges. Tariffs comparisons e.g. according to the OECD Tariff Models.

Quality. Article 5 of the proposal for a European Parliament and Council Directive on the application of open network provision (ONP) to voice telephony stipulates the supply time and quality of service indicators that are required.

The following list specifies the areas where the quality of service indicators are required: supply time for initial network connection; fault rate per connection; fault repair time; call failure rates; dial tone delay; call set up delay; transmission quality statistics; response time for operator services; the proportion of coin and card-operated public pay-telephones in working order; billing accuracy.

4. Statistics on Users and Usage of Telecommunications Networks

Introduction

A very important aspect is the transfer and diffusion of technology, services and applications in the society and economy. To be able to track this down it is necessary to have data from the user and usage side that are related to the universe of enterprises and

persons respectively.

It is important to collect data both on enterprises and on persons. It might well happen that 100 percent of the enterprises use a service or application, but only a few percent of all persons. If one has access only to one of these figures the conclusions might be totally different.

Where possible the data should be collected by adding or changing questions to existing surveys. The types of questions to be asked or data collected are of course different for businesses/administrations as compared to individuals.

The statistics should cover the following areas

- the extent of the usage of different services used
- different applications
- investment and cost or spending on telecommunications

Organisations as users

The two main types of data needed are economic data and more qualitative data, like persons
directly involved, equipment used, applications.

A prerequisite for reliable surveys of enterprises is good quality registers over the universe of the enterprises one wants to know something about, so that it is possible to make good samples. The current implementation of Business Registers in the European Union (Council Regulation (EEC) No 2186/93 of 22 July 1993 on Community Co-ordination in drawing up business registers for statistical purposes) will improve the sampling possibilities.

Economic usage data should be based on accounting data. At present a draft Council Regulation concerning structural business statistics is being considered in the Council. Article 3 of this draft states that it relates to the compilation of statistics on i.a. the factors of production used and other elements allowing business activity performance and competitiveness to be measured.

Statistics or studies of business usage is often done by investigating user panels. This gives good information for marketing purposes - customer care etc. But it is not of very much help for policy makers - they need information and statistics for the universe of businesses. The non-users are obviously of as great relevance and interests the users.
An example of a computer use survey that gives data for the universe of enterprises exists in the Netherlands. There is an annual survey of the use of computers in enterprises carried through. The questions are about equipment, personnel and costs/investments. Usually there is also every year an additional part concerning a special application, e.g. CAD/CAM.

Persons as users

It is trivial, but nevertheless important to underline that to get data on the use of telecommunications networks etc. by persons it is necessary to survey persons. To be able to do this new surveys have to be developed or existing ones revised. The information we are interested of is *who* uses the networks, the *extent* of the use, *spending* and the use of *different services* and applications.

In the following four examples of such surveys are given. Two exist already on the European level, i.e. Household Budget survey and Time Use survey. One on the use of computers that has been carried out in Sweden and one on telecommunications as part of the overall communication system, which is being planned in Sweden. It might be possible to develop these surveys so that they give better data for describing the networked economy.

Household Budget Surveys

All EU Member countries do household budget surveys, which are harmonised by Eurostat. They collect data on the availability of amenities, incl. telephones, and household expenditure on i.a. telecommunication. The data are distributed over different categories of households. These surveys are not done every year.

Time Use Surveys

At present a European Time Use Survey is being launched within Eurostat. In this version telephone calls are mentioned in three instances: as a category of its own "telephone conversation" under the heading socialising. Phone calls concerning the household management and arrangements are included under the category "household management" and phone calls in connection with profession under Employment.

Computer Use Surveys

In Sweden the use of computers by persons at work and at home has been surveyed three times. The technique has been to add questions to the ordinary labour force surveys. The questions concerning computer use have concerned how many use some kind of computer and who are they? what kind of computer is used? for what are the computers used? is the knowledge of how to use the computer satisfactory?

Networking at the workplace

The last survey, in June 1995, showed that more than 50 percent - or 2.11 million persons - of all occupied, i.e. self-employed and employed, persons in Sweden used a computer at

work in 1995. Of these were 1.65 million persons or approx. 80 percent using personal computers. Of these were approx. 70 percent connected to a network. Table 6.4.1 shows the use of the networks.

Table 6.4.1. Use of personal computers connected to a network.

Network use	Percent
Sharing printers	52
Sharing information, e.g. documents, calculations, databases	57
Administrative tasks like applications for holidays etc., time reports, travel expenses and general information concerning the organisation	32
Retrieval and/or submitting of information from/to external data sources like commercial databases, Internet etc.	21
Fax	20
E-mail	32
Whereof	
- for internal use in the own working place or the own organisation	*29*
- to communicate externally, outside the own organisation	*15*
Other	16

As one person can use the network for more than one purpose the percentages do not sum up to 100 percent.

Networking at home

28 percent or 1.4 million persons of the Swedish population (16-64 years) use a computer at home. About 40 percent of these use it in connection with their work.

240 thousand people or 17 percent of all who use a computer at home are connected via a telecommunications network to other computers outside home. Of these it is one third that answered that they did not use the connection. Usual uses are for communicating with public databases, BBS etc. on for example Internet, E-mail and fax. Only a little more than 1 percent used the connection for home-banking.

Communication Pattern Surveys

In Sweden a survey of the persons use of telecommunication as an element in the total communication system is currently being planned. The aim is to plan a pilot survey with the aim to develop regular, official, statistics on the interaction between telecommunication and physical communication by linking them together.

The objective is to link the use of telecommunication to actual travelling. The technique will be to add a number of questions on the use of telecommunications to the regular surveys of persons travelling patterns.