

Harmonised information statistics – official statistics for information society

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Introduction

Statistics support decision makers in conceptualising situations, events and processes. Statistical concepts are needed to be laid into the fundamentals of policy and strategy backgrounds, and statistical figures are needed to outline the positions and objectives. No good decisions can be made without good quality statistics. The stakeholders concerned are population, groups of population and governments of countries and enterprises. As long as various stakeholders make various types of decisions the statistics they need should be different. Business players and other interest groups have always tried to force government agencies and populations to view the world through their glasses and vice versa.

While several private business corporations, as Paul Kagan Associates, IDG, Dataquest or Nielsen have developed strongholds in the field of media, telecommunications and IT statistics and information, official statistical institutions can not be left out of or be replaced in the field of statistics of information society. Those are official statistical agencies alone that are able to collect, process and interpret so many data from so different terrains which is needed to let see an information society in statu nascendi. Public statistical offices provide information not influenced by domestic and foreign market players and elaborated for use in the legislation and administration process that is continued in the interests of the citizens. Furthermore the provision of a comprehensive picture of an information society is well beyond the capabilities of a market organisation, an individual government agency or a scientific research institute. In the next indents official statistics for information society will be discussed.

Design and architecture of official statistics for information society

Traditional subjects of government information policy are free speech - First Amendment, privacy, dissemination of government information - synergy of government and private information sectors, freedom of information, transborder flows of information, intellectual property, equitable information infrastructure, antimonopolistic regulation, data protection - industrial and state secrets, commercial speech, universal service, academic freedom, public information goods, censorship - pornography - decency, use of native language by minorities, and language imperialism. In central government, information is viewed in a number of ways: as source of power, as an economic resource, as a produced and consumed commodity, as cultural and moral value and as an object of protection. These aspects should be assessed and harmonised in the frames of a comprehensive information policy which extends to the public and private sectors.

The qualification of a society as an information society should be an operational statistical procedure rather than journalism. In accordance with ITU I believe an information society certainly is a kind of societies, a society with special features that distinguish it from other kinds of societies, particularly from agricultural, industrial or feudal societies. In accordance with a definition by Hungarian Central Statistical Office, a society can be called *an information society* if and only if information commodities dominate in its national product and consumption.

Information should be understood here as something which forms or formed within (the brain of) either human or machine actors, or represents something in/on the goods/non-durable signals which are outputted, consumed, distributed or accumulated. The volume/amount of information carried by physically existing goods and services - in a standardised communication situation as defined for this purpose - is an attribute of goods and services which is similar to some physical parameters. This interpretation seems to be in harmony with exact theories of information, such as Shannon's. Knowledge is [Die94]

A good that carries information is called an *information carrying good*. [Die94] There is a class of goods and services whose main function is just to convey/carry information, these are called information goods and services. *Information goods* are physical objects that are to carry or convey information, over which ownership rights can be or is established, and whose ownership can in principle be transferred [KSH86]. This definition does not require that the good should be

at any moment of its physical existence apt for alienation or for market alienation, that such goods are usually alienated and demand or market should exist for the object or that kind of object at any moment of its existence. The information goods to be accounted extend to the most commonly used durable media: paper, magnetic media and film. Information goods do not include machines like computers, office and telecommunications devices; rather they include books, diskettes, records and a number of other durable media. [Die94] Information machines, equipment, tools and materials should be shown among resources used in social reproduction of information.

Human knowledge, skill, abilities and moral values is information carried by humans, mostly in brain and nervous system should also be the subject of statistics. For the needs of the statistics of information society, *non-durable signals* should be added to those things that can be produced, consumed, traded etc. Non-durable signals can be supplied to a number of consumers who consume them. Copies of non-durable signals have producers, consumers and users. Their producer may have intellectual property rights, but no physical ownership can be established over them. Provision of non durable signals is an information service.

An activity that leads to the change of volume of information a good, a non-durable signal or a human carries so that no new information good is created will be called *information service* [KSH86]. Reparation, transformation or mending of information goods, creation of durable signals on or in non-information goods so that no new good will be created and supplying non-durable signals are the main kinds of information services. Updating a database, repairing a book, counselling, consulting, teaching, radio-broadcasting are examples of information services which are classified as economic services in SNA as well. A number of information services, however, are beyond the production boundary of SNA as it is. CPA does not provide operational definitions, the definitions available are not always helpful in classifying real "billed" and priced services. It should be considered necessary, that ITU standards do not define economic transactions, economic services as they are supplied, but technical details of equipment and technical processes.

In a society like defined as an information society, those are not only telecommunications and computer services industry alone that should be shown through statistical figures. What is more, statistics for an information society must not focus at indicators of industrial type, i.e. market size, turnover, growth of market, structure of the market by groups of goods and sellers etc. at all, since new phenomena and processes should be concerned throughout the society. The impact of information technologies on society extends to all traditionally studied sectors of society: enterprises, governments, non-profits, households and individuals, and various non-formal ethnic, language, gender and regional communities. The impact of these processes can be observed in new industries, as multimedia, telematics, mobile telecommunication and others, but political conflicts are not less common in the traditional information industries, as education and administration or law enforcement. Societies are different, and so will be information societies. The development towards a new quality: to be an information society is not a one road and not a one way process. The statistics made from an opposite starting point [Welch97] serve to ideologicistic purposes rather than real decisions and may be completely disturbing or misleading. Statistics for government and citizens of an information society should be statistics on that particular information society and should reveal its particular features.

The transition to new kinds of societies, particularly European information societies, where information goods and services dominate in production and consumption, is characterised by four, more or less independent processes;

- Growth of volume and share of information activities,
 - Overall digitisation which comes together with restructuring of economy and society
- Teleworking, part-time jobs, ubiquitous entrepreneurship, edutainment, huge government and corporations' databases with data for individuals lead to shift of boundaries between privacy and publicity i.e. households
- New industries, occupations
New geographic centres of economic activity
Transport is replaced by telecommunications
Globalisation
- Information flows are more and more driven into standard, controlled channels and
 - Generic information services not bound to specific kinds of contents or media classes gain more and more ground.

Information statistics is statistics on societal reproduction of information, that is information production, consumption, distribution, accumulation, and their resources and actors; when commensurable information goods and services are viewed together, independently of their content and physical carrier. At this, all kinds of information commodities treated. Information statistics require the reevaluation of statistical data of telecommunications, culture, audio-visual services and other industries rather than new surveys. Traditional indicators should be generalised to derive new indicators for information society and their value contributes to the value of these new indicators.

Official information statistics are information statistics, produced by government agencies - to serve national legislation, administration, citizens of the countries, businesses international organisations and the Community's organs.

Comprehensive information statistics address the national-level issues, the issues from a national viewpoint, from the point of legislation, national government or prime minister. Other affairs - as particular problems of stimulation of economy, public education, regulation of telecommunication prices, just to mention some of the several information policy issues - belong to the responsibility of one or more ministers. The statistics that are intended to help industrial ministers, like Minister of Post and Telecommunications, Minister of Public Education and Culture, Minister of Justice, Minister of Manufacturing and Trade and similar to perform their duties are called *industrial statistics*. Industrial statistics address the issues that should be treated at the level of industrial ministers. While traditional telecommunications statistics or education statistics show the phenomena or processes from an industry-internal aspect, industrial information statistics present them as parts of those of the entire information society.

With the extension of information sector, policy issues have been proliferating and the economic aspects gain ground: a sector that covers half the national economy can not be influenced by the traditional privilegisation like a brand-new technology or a niche industry can be. In the enlargement process of the European Union both organs of the EU and of CEE countries need information to conduct structured dialogue successfully.

EU and CEE countries define their *own appropriate vision* of the information society desired to come and *their own conflict areas*. Explorative and functional information statistics should be prepared at statistical agencies, *by revising all subject areas of official statistics*, identifying the areas and indicators that are relevant to the issues of information society.

Official statistics should include functional and explorative statistics. *Functional statistics* meet the demands for data to perform the lawful duties of organs of national and EU legislations and administrations to cope with known processes and phenomena as well, as validated demands of enterprises and population. It is recommended that the countries organise their functional information statistics according to the functional distribution of responsibilities codified in the constitution and other laws of the countries. The information system of "information society" at any time should fit the lawful system of the countries. Explorative statistics concerning issues not belonging to the responsibility of any agency or of more agencies should be launched by national statistical agencies.

The purpose of *explorative information statistics* is to identify new, formerly not known or ignored objects and phenomena related to information revolution as well as strengths and weaknesses of industries, countries or regions, making the administrative organs, business stakeholders and population aware of existence or persistence of these objects and phenomena.

Several efforts were made to show emerging information industries and societies in a common intellectual framework. Bell's, Machlup and Porat's [Por76] pioneering research studies, Rubin's [Rub] study in the United States and Jussawalla's works all represented significant steps towards a system to account information flows and stocks of knowledge. As an obligatory ingredient, various national information or computer policy strategy documents also provide the reader with information statistics, reflecting and explaining the view and priorities of the strategy. At the same time these efforts could not aim that they cover the whole system of social reproduction of information. While several private business corporations, as Paul Kagan Associates, IDG, Dataquest or Nielsen have developed strongholds in the field of media, telecommunications and information technology statistics and information, official statistical institutions can not be left out of or be replaced in the field of statistics of information society. Those are official statistical agencies alone that are able to collect, process and interpret so many data from so different terrains which is needed to let see an information society in statu nascendi. Societies are different, and so will be information societies. The development towards a new quality: to be an information society is not a one road and not a one way process. The statistics made from an opposite starting point [Welch97] serve to ideologistic purposes rather than real decisions and may be completely disturbing or misleading. Obviously the provision of a comprehensive picture of information society is well beyond the capabilities of a market organisation, an individual government agency or a scientific research institute. In the next indents experiences of official statistical agencies will be shortly dealt.

It is recommended that standard information statistics in the EU and CEE countries should have a solid standard conceptual basis, that information societies should be described by an architecture of indicators, a coherent theoretical framework within which the impacts of government measures as well as of spontaneous development, including technical development should be modelled and simulated. It is recommended that information statistics should be built upon a proper view of life and economy in an information society, which is in harmony with a deep insight into the very nature of information processes and phenomena and with the vision of the kind of commodity production to come. It is recommended that - for the long range - the commodity-producing information societies to come be described in the frames of a new version of SNA/ESA. SNA should be reformed in a way that it can provide a conceptual framework to handle national and international policy issues in and between the new societies based on information flows. It should cover those subjects, objects, relations, acts, actions and activities which are subject to legal definition, require comprehensive treatment and can be subject to operationalisation. New integrated sectors; the main groups of social actors of information affairs and transactions, who are relevant to policy making, should also be

added to those of SNA /ESA to reflect real situation, phenomena and processes. Boundaries between production and consumption, final consumption and productive consumption should also be redefined. It is recommended that the Hungarian system (SNIA) should be accepted as a working material in elaborating a new SNA/ESA. OECD and UNSO should be asked to lead a research and development consortium for the revision of SNA/ESA. Eurostat should develop ESA accordingly. It is also recommended that for short term SNA as it is be applied for systematisation and ordering of statistical information on the information society. Comprehensive information statistics should be summarised in *national information accounts*. An *account* is a tool which records, for a given aspect of economic life, the uses and resources or the changes in assets and the changes in liabilities and/or the stock of assets and liabilities existing at a certain time. [SNA93]. The fundamental concepts of SNIA are as follows.

Institutional units are entitled to own goods or assets in their own right and therefore are able to exchange them, take economic decisions and engage in economic activities for which they are held to be directly responsible and accountable at law and able to incur liabilities on their own behalf, to take on other obligations or future commitments and to enter into contracts [SNA93].

Economic flows reflect the creation, transformation, exchange, transfer or extinction of economic value; they involve the changes in the volume, composition, or value of an institutional unit's assets and liabilities. [SNA93]. In accordance with this, an action evokes *information flow* if it leads to the change of *knowledge stocks* of participants. Knowledge stock is understood as total volume of information carried by the goods owned and humans employed. [Die94]. A *transaction* is an economic flow that is an interaction between institutional units by mutual agreement or an action within an institutional unit that is analytically useful to treat like a transaction often because the unit is operating in two different capacities.[SNA93] A transaction can be called an *information transaction*, if it implies the flow of information. [Die94]

Information -input, -output, -production, -consumption, -use, -asset, accumulation of knowledge, -capital, stocks of knowledge, productive -consumption, -capital consumption, -export, -import, waste and externalities are defined as input, output, production, consumption, assets etc. of information commodities. Unlike SNA, information statistics should make difference between use and consumption: while consumption assumes annihilation of the good or service, use does not. [Die94]

Economic activity is the type of production a statistical (mostly institutional) unit engages. The term "activity" is to be understood as a process, i.e. combination of actions that result in a certain set of products. [ISIC] An institutional unit engages in an information activity whenever it produces information, i.e. it outputs information goods or services [KSH86].

For the purposes of the present study, *an industry* is a class of a standard general (activity based) industrial classification system, as NACE. An industry consists of a group of establishments engaged in the same type of productive activity. [SNA93]

An industry is called *an information industry* if it is defined by information activities only. In an organisational aspect an information industry embraces all institutional units, whose principal activity can be classified as belonging to those specified in the definition of the industry. An industry is called semi-information industry if it is defined by information activities as well as and non-information activities. [KSH86]

In an activity view, *information economy* embraces all information activities completed in a region during a period. In an organisational approach, primary information economy embraces those institutional units that belong to information industries, that is, whose main activity is a kind of information activities [KSH86].

Generally speaking, valuation is the process and way, how a size measure (a number) is ordered to the things produced, consumed, used, distributed etc. *Valuation of a transaction* can happen in value/monetary units or natural units. In the SNA, transactions are valued at the actual price agreed upon by the transactors. Market prices are thus the basic reference for monetary valuation. In the absence of market transactions, valuation is made according to costs incurred or by reference to market prices for analogous goods or services.[SNA93] The progress of digitisation makes the introduction of a new kind of valuation possible, even desirable for information carrying commodities. While the valuation of transactions in SNA has practically been based upon general substitutability of goods and services for money, opportunity of exchange for money, the valuation of information goods and services in information statistics should be based upon their general substitutability for a digital carrier or a digital record. Accordingly, it is not information which should be considered as resource or product, but goods as well as non-durable signals which carry/convey information - in agreement with SNA where it is not "value" which is considered as a resource or product, but goods which have or carry value. The tables for main indicators -- called twin (bit and monetary value) tables -- show "information economy" in a commodity approach. These tables do not belong to the standard set of tables of SNA/ESA, for they contain figures for such groups of goods and services whose elements are scattered in a number of

industries of standard SNA/ESA as it is. This set of twin tables, however, creates a bridge, a direct linkage to SNA/ESA.

Harmonised official statistics should support the common view for decision making by national governments and supranational organisations in international affairs. It is recommended that all groups of goods in HS, CPC, CPA and PRODCOM be classified into information goods, information carrying non-information goods and non-information goods NEC, and a new classification be established for those durable products not yet taken into account as goods. Furthermore, the kinds of machines, buildings, materials that have been used for production of information goods should be identified in terms of HS, CPC, CPA and PRODCOM. These should be called information machines, buildings and materials, respectively. It is recommended that through direct analysis of transactions, described in contracts and tariffs throughout Europe CPA be revised concerning information and telecommunication services, all groups of services in the revised CPC and CPA be classified as information services, information carrying non-information services and non-information services NEC. A new classification should be established for those non-durable products, which carry information. It is recommended that categories of human information and the actions that lead to the acquisition, maintenance and loss of this information should be defined in a way that is apt for statistical study. The contents of concept of labour and labour resource: should be re-valuated with a special reference for students and life-long learning, employment and social security. Standard information occupations should be identified by the categories of ISCO. It is recommended, that a more detailed than the present NACE classification of economic activities should be in information statistics.

Harmonisation of official information statistics in the CEE region should be organised in the frames of a project, a common effort of EU and the countries involved and should serve the interests of both sides. It is recommended that - added to harmonised national-purpose information statistics of the CEE countries - *supplementary statistics show the transition process of CEE countries*. These statistics should extend to the issues of the

- requirements of the EU defined for the CEE countries going to join the Community
- issues of common Community policy established in various documents
- phenomena and processes in the CEE countries that influence the convergence and adaptation, particularly international conflict areas between EU and CEE countries and between CEE countries.

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