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## STATISTICS ON THE INFORMATION SOCIETY IN SWEDEN

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## **STATISTICS ON THE INFORMATION SOCIETY IN SWEDEN**

### **1. Report on the need of statistical indicators for the Information Society**

In September 1997, the Swedish government instructed Statistics Sweden (SCB), to investigate which comparative figures should form the basis for continuous production of statistics in the IT-area. These statistics will help in monitoring the growth of the information society and the effects of measures by the public sector at both national and regional level. It has been translated into English, with the title *The Future of Swedish IT Statistics*.

The aim of the report was to make proposals for areas of statistics and continuous statistics which are of central importance for the evaluation and review of the objectives of the national IT strategy. This was described in government Bill 1995/96:125 Measures to broaden and develop the use of information technology. The Bill surveys thirteen action areas where the increased use of information technology (IT) promotes creativity, growth and employment.

The starting point for the areas in the Bill has been the sub-goals in the various action areas. SCB then decided which of the goals were suitable for analysis and review using statistics. After that an inventory has been made of which the preferred statistics that is available in Sweden and other countries. This has served as a base for suggestion on different kind of statistics that should be continuously produced. The main findings in this study is that it in a short term view is important to study the use of computers and data communication among people and in organisations. As a part of this it also is important to measure how the provision of information takes place in society with the help of IT. Another conclusion is that it is crucial to make IT-statistics available and internationally comparable.

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### **2. Report concerning statistics on teleworking**

During the summer of 1998, Statistics Sweden was assigned by the Swedish National Board for Technical and Industrial Development, NUTEK, responsible for IT-statistics in Sweden, to write a report on statistics over teleworking. The report is a compilation of available statistics on teleworking in Sweden and a few selected countries. The statistics have been gathered from several different studies. The main finding is that since there does not exist a common definition of teleworking and survey methods differ between countries, data are not comparable.

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### 3. Survey of communication habits

The Swedish Institute for Transport and Communications Analysis (SIKA) has developed a survey on communication habits which aims to collect useful statistics concerning individuals' communication habits. The survey has different objectives and one of these is to describe access to, and use of, telecommunication equipment all over the country, and elucidate discrepancies that may occur between regions or different groups of individuals. The data should be able to describe changes and will be used as a source for forecasting how access to, and use of, telecommunication services develop. Another objective is to study how new techniques for communication influence the need of physical transport.

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### 4. The use of IT within enterprises

There are substantial needs for reliable surveys and analyses of the use of information technology within organisations and individuals, to serve as a basis for possible actions. It also exists a need to make comparisons between organisations, sectors and countries. NUTEK, has financed, and together with Statistics Sweden performed a survey of the use of IT within companies. The sample consists of 1200 enterprises within five industrial branches, machinery industry; food, beverages and tobacco; electronic equipment and instruments; transport services; and finally software/computer consultants. The study focuses on motives for and consequences of the use of IT, such as organisational changes, new ways of collaboration and distance independent activities. Furthermore, IT as an enabling technology when developing new products and services is of interest. Another aim of the study, was to investigate how the companies experience the supply of IT professionals, and how they meet the need for skilled personnel.

The survey also asks questions about how the computer support and maintenance is organised, concerning among other things out-sourcing and formalised plans for the development of IT-related activities. Another important part of the study is how much the companies invest in IT-related products and services. A descriptive report in Swedish constitutes the first part of the account of the survey. The report presents the companies' answers to the questionnaire, related to industrial sector and size of the company. The project continues, and data from the questionnaire will be combined with background data about the companies, in order to analyse the use of information technology related to such issues as the share of women, the share of educated within science and technology, the share of IT professionals and also the educational level in general. Regional aspects will also be studied. The results from the further studies will be presented in a report from NUTEK during the early autumn of 1998.

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## **5. The use of IT within municipalities**

During 1998 NUTEK is performing a pre-study with the aim to investigate prepositions, possibilities, needs and demands concerning a quantitative study of the use of IT in municipalities. The methods used in the pre-study are literature study, interviews and case studies.

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## **6. The electronics industry and IT-related service companies 1998**

NUTEK is financing a report, produced by Statistics Sweden, that describes the electronics industry and IT-related service companies in Sweden. The report will, as its predecessors, mainly contain economic data on these industrial branches, such as data on production, trade, employment and R&D. The methods used have been jointly developed by NUTEK and Statistics Sweden, the data collection and the editing of the report is performed by Statistics Sweden. The 1998 version of the report will be available by late June 1998.

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## **7. Measuring databases and stocks of digital information in the public sector**

Databases and stocks of digital information has compared to other means of production got a bigger importance. This is a known fact but very little work has been done in measuring and valuing databases and stocks of digital information. The Swedish Agency for Administrative Development therefore has commissioned Statistics Sweden to make a pilot study which aims at giving proposals for measurement which can be used for describing the value of databases and stocks of digital information in the public sector. The results from this pilot study is published in the report "Att mäta informationsinvesteringar".

The study has been conducted through interviews with experts on and those who manages big databases and stocks of digital information. Statistics Sweden has through these interviews got information about what aspects of databases and stocks of digital information that is important and possible to measure. The first insight is that it is essential to divide digitally stored information in to different types as for example information for the public or for administration/production of services etc. The second insight is that it in many cases is difficult for organisations in the public sector to answer questions about their digitally stored information. Very little "metainformation" has been recorded and is available in a systematic way about databases and digital information in the public sector. This fact has limited the amount of data that is possible to collect right now with simple interviews. From that point of view the pilot study gives suggestions for basic measurements when describing databases and stocks of digital information. The main findings are that it is suitable to measure the type of, size, how often the database is updated and number of users.

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**8. Pilot survey on telecommunications**

Statistics Sweden - responsible for official Economic Statistics - and SIKA - responsible for statistics on Telecom - are jointly undertaking and financing a national study concerning the operators in the telecommunication market. As part of a pilot study, Eurostat has together with some memberstates developed a questionnaire in order to collect operator information. Statistics Sweden is a partner in this work and in the case of Sweden, the Eurostat questionnaire has been made a part of the national study questionnaire. This covers more variables than the Eurostat one.

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**9. Development of a comprehensive system for statistics on ICT in Sweden**

The Swedish Government is preparing to commission SIKA to be responsible for the development of a system for a comprehensive statistics on ICT in Sweden. This project is a follow-up on the project on need of statistical indicators for the Information Society made by Statistics Sweden that is described under item 1. The work shall be carried out in co-operation with among others Statistics Sweden and NUTEK and take one of its starting points in the reports on the need for IT statistics earlier produced by these bodies. The work has also to consider the Governments national IT strategy and the special fields of actions depicted in the strategy. Special considerations has to be made to make the statistics available and "harmonised" so that international comparisons are made possible. The project must handle short as well as long term aspects of the problems and a first working phase shall be finished within a three year period.

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**10. Nordic workshop**

NUTEK was commissioned by the Nordic Minister Council to arrange a workshop on IT-statistics, jointly financed with NUTEK. The workshop took place in Stockholm the 27<sup>th</sup> - 28<sup>th</sup> of November 1997, and gathered representatives (developers, users and producers of IT-statistics) from all Nordic countries. Among other important issues, the possibilities to construct reliable methods for measuring electronic commerce and the development of the software industry, were discussed.

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## **11. Education and labour market for IT-professionals**

The supply of professionals within the area of information technology (IT) is important for both the development and use of IT. NUTEK has performed a longitudinal study of the university educational programmes within the area of IT, between year 1977 and 1996. These programmes have been studied from several points of views. For example number of beginners and graduated and the throughput, distributed by male and females, different programmes, universities and years. Furthermore the labour market for IT-professionals, year 1986, 1990 and 1994, has been studied. The results have been documented in a report "Utbildning och arbetsmarknad för IT-specialister" NUTEK R 1998:16.

Educational programmes within IT at Swedish universities have been available over 20 years. For this study five main educational groups were defined:

- civil engineers within computer and electrical science and engineering (4-4,5 year programmes)
- engineers within computer and electrical science and engineering (2-3 year programmes)
- system analysis (1-3,5 year programmes)
- other IT-programmes (for example software engineering)
- graduates, both licentiate and doctoral level, within the area of IT

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## **12. Developing methods for measuring ICT-usage in Nordic companies**

The Nordic Council of Ministries has after an application from the national Nordic statistical institutes decided to sponsor a project which aims at developing methods for measuring ICT-usage in Nordic companies. Core participants in the group are Statistics Denmark, Statistics Finland, Statistics Island, Statistics Norway and Statistics Sweden. The Swedish national Board for Industrial and Technical development has observer status since they have done a lot of work in this field. Sweden is through Statistics Sweden the leading country and will therefore act as project leader. The project started with first meeting in March 1998 and will end with a final report in December 1998.

The project aims at developing guidelines for measuring usage of ICT in Nordic companies. Special emphasis will be put developing methods for measuring small and medium sized companies. The guidelines will have the form of a manual that will be ready by the end of 1998. The Nordic group will meet four times when most of the work will be carried out. Between these meetings Statistics Sweden will, as representative for the leading country, put together the results and communicate it with the other Nordic countries and prepare for the next meeting. The project will also have country-specific tasks that will be carried out between the meeting as for example finding out national needs of statistics on ICT-usage in companies.

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**13 Access to computers in Swedish schools**

The Swedish National Agency for Education has since 1993 every second year carried out surveys on access to computers in schools. The last survey was carried out in 1997 and gave the following results.

The number of computers in the schools continued to increase markedly between 1995 and 1997. This applies both to computers used by teachers and ones used in teaching.

The number of computers for teacher use has increased by 66 percent at municipal basic compulsory schools, 51 percent at upper secondary schools, 65 percent within local authority-administered adult education, and 91 percent at schools for the developmentally disabled.

The number of computers used in teaching at municipal basic compulsory schools has increased by 62 percent. At upper secondary schools, the increase has been 31 percent, within adult education 41 percent, and at schools for the developmentally disabled, 25 percent.

Since 1993, an increasing proportion of computers has been placed in classrooms. Almost two-thirds of the computers used in teaching at the compulsory school level and four-fifths in the schools for the developmentally disabled are now found in classrooms. At upper secondary schools and adult education, however, more than two-thirds are still found in special computer rooms.

The number of schools who have access to Internet varies a great deal among different forms of schools, with the highest proportion in the municipal upper secondary schools (91 percent) and the lowest at adult education for the developmentally disabled (30 percent).

Between the years of 1995 and 1997, the number of teachers at basic compulsory school (adjusted to number of full-time positions) per computer has decreased from 12 to six. At municipal upper secondary schools, two teachers share one computer, and at the county council and independent upper secondary schools, there is now one computer per teacher.

Since 1995, the number of school boards/administrative bodies who submit that they have adopted some kind of IT strategy/action program for the field of computers has also increased substantially. Within municipal basic compulsory schools, upper secondary schools, and adult education, two-thirds or more reply that they have such a plan.

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