

Unclassified

DSTI/ICCP/AH/RD(98)3



Organisation de Coopération et de Développement Economiques
Organisation for Economic Co-operation and Development

OLIS : 12-Jun-1998
Dist. : 15-Jun-1998

English text only

DIRECTORATE FOR SCIENCE, TECHNOLOGY AND INDUSTRY
COMMITTEE FOR INFORMATION, COMPUTER AND COMMUNICATIONS POLICY

DSTI/ICCP/AH/RD(98)3
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TOWARDS A DEFINITION OF THE ICT SECTOR: A NORDIC APPROACH

OECD, Paris, 18-19 June, 1998

This room document presents "Nordic Countries" work on a definition of the ICT sector. It is submitted for information under Item 4.1 of the draft agenda.

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TOWARDS A DEFINITION OF THE ICT SECTOR: A NORDIC APPROACH

1. Introduction

One of the most urgent challenges for the statistical institutes is the need for monitoring the information society in general, and the information technology and communication activities especially. The complexity and speed of developments towards the information society and convergence of the ICT activities demand a profound methodological work in order to identify and establish the indicators to be used to provide the necessary information about the information society.

Small statistical institutes as the Nordic institutes do not have the resources to carry out this work on their own. This is the reason that the five Nordic statistical institutes have started two projects related to ICT, one concerning a common definition of the ICT sector, and a second one concerning the use of IT in the enterprises. Both projects are financed by the Nordic Council of Ministers. From the Nordic ministries the priority has been given to elaborate a common framework to be used at least by the five Nordic countries and thus to produce statistical data which are mutually comparable. It is stated in the objectives of the Group that the work has to be carried out within 1998, resulting in a publication with statistical information on the ICT sector published this year as well.

This paper presents the draft definition and delineation of the information and communication technology sector as agreed upon by the Nordic statistical institutes at this stage of the project. Before introducing a final definition we await the comments of the Statistical Panel of OECD.

2. Definition and delineation of the Information and Communication Technology activities

The starting point has been the definitions previously used in each of the Nordic countries. Even if there existed no common definition the action was furthered by the fact that the NACE Rev.1 nomenclature is used in all Nordic countries, thus giving the elaboration of a common definition a common framework.

The first question to be addressed by the Group has been the delineation of the population to be observed, ie should a broad definition including the contents industries reflecting the Information Society as the NAICS be adopted or a more narrow definition constituted by activities related to information technology as electronics and computer services. There was a common agreement amongst the statistical offices that a relatively strict definition of the core ICT activities was the best starting point.

There was a general agreement that the optimal method for defining the ICT sector would be to define the ICT - products and services in the first phase, in the second phase to define the enterprises at the micro level in which the value added/turnover of the defined IT products/services constitute more than 50 per cent of the total value added/turnover of the enterprise. In praxis, though the method is not feasible due to a number of reasons;

Firstly, we do not have the same information about the services offered as about the goods produced. So we are not able to produce a breakdown of the services - leaving us only with the manufacturing part of the ICT sector.

Secondly, even if there is detailed information about the goods to be obtained, the rapidly changing nature of the goods makes it difficult to identify the ICT goods in the existing nomenclatures, be it the Central Product and Activity nomenclature or the Harmonised System of goods.

Thirdly, even if we can register the turnover of the enterprise, we are left with a measurement problem; shall we only classify enterprises with more than 50% of their turnover coming from ICT products or are enterprises also to be classified as ICT enterprises, if they produce X % or more of the total national production of a certain ICT product even if it is not the main activity of the enterprise?

Fourthly, by choosing the enterprise as the level of observation, the problem of maintenance of the information concerning the production of ICT goods is central. The continuous collection of information about the breakdown of turnover of each potential ICT enterprise of which many might be relatively small, and the products often rapidly changing, would require such an amount of resources that it is for the majority of the statistical offices not judged realistic to maintain on a permanent basis.

Due to these reasons the Group has chosen an approach where the level of observation is the activity classes, ie defining the activities which constitute the ICT sector. But as mentioned below the Group realises that more detailed statistical information is needed and the Group shall work with different levels of statistics and definitions, from structural business statistics based on the activities to statistics based on products.

In the work of delineating the activities to be classified as ICT activities we have lacked an explicit definition of the ICT activities. Implicitly, elements as electronically production, storage and transformation of information as sound, text or picture and the related services have been considered determining for the possible classification of a certain activity.

Due to the rapid changing nature, complexity and convergency of the activities the Group decided to work with a system of building blocks consisting of individual activities at the 4-digit NACE level. The building blocks can be grouped in three:

- 1) **Core Information and Communication Technology activities** with a subdivision into manufacturing and services activities
- 2) **Non core Information and Communication Technology activities** which only partly can be associated with the ICT activities. Some of these activities form a group of:
- 3) **Information contents activities** which are not the priority task of this group to define in details. We have used the definition put forward by the Statistical Panel of the OECD as a reference framework for this grouping of activities.

In total, the activities classified in one of the three above mentioned groupings constitute the **Information activities**.

There has been agreement about considering the following activities as core ICT activities:

Core ICT activities (NACE Rev.1 nomenclature)

ICT Manufacturing activities

2233	Reproduction of computer media
3001	Manufacture of office machinery
3002	Manufacture of computers and other information processing equipment
3210	Manufacture of electronic valves and tubes and other electronic components
3220	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy
3230	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods

- 3320 Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment
- 3330 Manufacture of industrial process control equipment

ICT services activities

- 6420 Telecommunications
- 7133 Renting of office machinery and equipment, including computers
- 7210 Hardware consultancy
- 7220 Software consultancy and supply
- 7230 Data processing
- 7240 Database activities
- 7250 Maintenance and repair of office, accounting and computing machinery
- 7260 Other computer related activities

This list is on the one hand relatively limited in coverage compared to for instance the NAICS but on the other hand more extensive than the proposal put forward by OECD.

Apart from the above mentioned activities which were approved by all Nordic countries there were a number of activity classes put forward in the first proposal, see below. In a later phase a breakdown of the manufacturing industries by products produced will be carried out in order to determine the IT contents of these industries. The result of this breakdown will be used as a basis for determining whether the activity can be classified as a core ICT activity.

Concerning the services activities where we do not have the same product/services information we shall have a look into the national activity nomenclatures in order to see if it is possible to establish a more detailed breakdown of the NACE activities and thus determine whether a part of the NACE class can be identified as a core ICT activity at a national activity level.

Observation list for ICT activities

ICT manufacturing activities

- 3110 Manufacture of electric motors, generators and transformers
- 3120 Manufacture of electricity distribution and control apparatus
- 3130 Manufacture of insulated wire and cable
- 3140 Manufacture of accumulators, primary cells and primary batteries
- 3162 Manufacture of other electrical equipment n.e.c.
- 3310 Manufacture of medical and surgical equipment and orthopaedic appliances

ICT services activities

- 5143 Wholesale of electronical household appliances and radio and television goods
- 5164 Wholesale of office machinery and equipment
- 5165 Wholesale of other machinery for use in industry, trade and navigation
- 5245 Retail sale of electronical household appliances and radio and television goods
- 5248 Other retail sale in specialised stores
- 7310 Research and experimental development on natural sciences and engineering
- 9211 Motion picture and video production
- 9212 Motion picture and video distribution
- 9220 Radio and television activities

Concerning the distributive trade activities there was agreement between the Nordic countries that they have to be included, but the problem is the level of aggregation and thus the heterogeneity of the NACE activities within distributive trade, ie NACE 5143, 5164, 5165 5245 and 5248. Clearly a more detailed breakdown is needed before part of these activities can be identified as ICT activities. In the national nomenclatures, however, such a detailed breakdown is already existing in a number of cases. In this paper two examples are given to illustrate the differences;

5143 Wholesale of electronical household appliances and radio and television goods. This NACE class is broken further down into 2 subclasses in Finland (Wholesale of electronical household appliances and Wholesale of radio and television goods), 3 subclasses in Sweden (as in Finland supplemented with Wholesale of gramophone records, tapes, CDs and video tapes). In Denmark the same three groups as in Sweden are specified in the nomenclature. The rapid changing character of the products might be illustrated with the example of wholesale of video games which in Denmark is classified in 5164 Wholesale of office machinery and equipment. This class also contains the wholesale of standardised software.

5248 Other retail sale in specialised stores is an example of the heterogeneity of the distributive trade classes in the NACE nomenclature. In Denmark this class is subdivided into 20 subclasses of which at least 3 contains activities relevant for the ICT sector, ie Retail sale of games and toys (including video and computer games), Retail sale of computers, office machinery and computer programmes and Retail sale of telecommunication equipment. These subclasses can also be found in the Swedish activity nomenclature, and in Finland the Retail sale of hardware is isolated in an independent subclass, but Retail of telecommunication is grouped with office machinery.

These examples clearly underline the difficulties of delineating the core ICT activities on a harmonised basis with the existing international and national nomenclatures. Following this observation an output of the project shall be a list of NACE classes divided into more detailed subclasses on a harmonised basis for the five Nordic countries.

3. Statistical indicators

The two factors which characterise the information society, the “horizontal” aspect and the rapid pace of change, give rise to various new user requirements. Economic activities have to be defined differently for the purposes of business policy analyses, for example, from the way in which they have been defined in present classifications of industries/branches. Users obviously need to regroup existing industries into new, cohesive areas of activity. This is perhaps most clearly seen in connection with the information and communication technology branches covering a broad spectrum of activities from manufacturing to telecommunications, computer services and the audiovisual sector, cf. above.

When monitoring the supply side as we do by taking the approach in the ICT activities the indicators needed may not necessarily imply the collection of new characteristics but will to a large extent consist of already existing statistics regrouped in a different way.

At this stage of the project we have concentrated on illustrating the relative economic importance of the ICT activities in the total economy of each of the Nordic countries by four of the most central structural economic variables in enterprise statistics, namely no. of enterprises, no. of employees, turnover and value added.

The reason why the ICT sectors of the Nordic countries are not compared in absolute figures is that the statistical data which have been used at this stage are not necessarily using the same definitions or covering the same activity classes.

In the first part of the figures (consisting of figures 1.1.-1.4), the ICT activities are subdivided into core-ICT activities and activities on observation in relation to ICT (non-core ICT activities) as mentioned in chapter 2. These are again related to the total private sector consisting of the NACE groups 15-37, 45, 50-74, 92 and 93.

The second part represents the ICT manufacturing activities in relation to the total of manufacturing activities (NACE groups 50-74, 92), hence the ICT services activities in relation to the total of the services activities (NACE groups 15-37).

Looking at the importance of the ICT sector measured in no. of employees, figure 1.1 shows that the relative share of the core ICT activities constitute between 3% (Norway) and 5% (Sweden) of the total employment in the private sector.

The non-core ICT activities constitute a somewhat larger part of the employees, from 4% (Iceland) to 7% (Denmark). For Denmark, Finland and Norway the non-core activities constitutes the largest group.

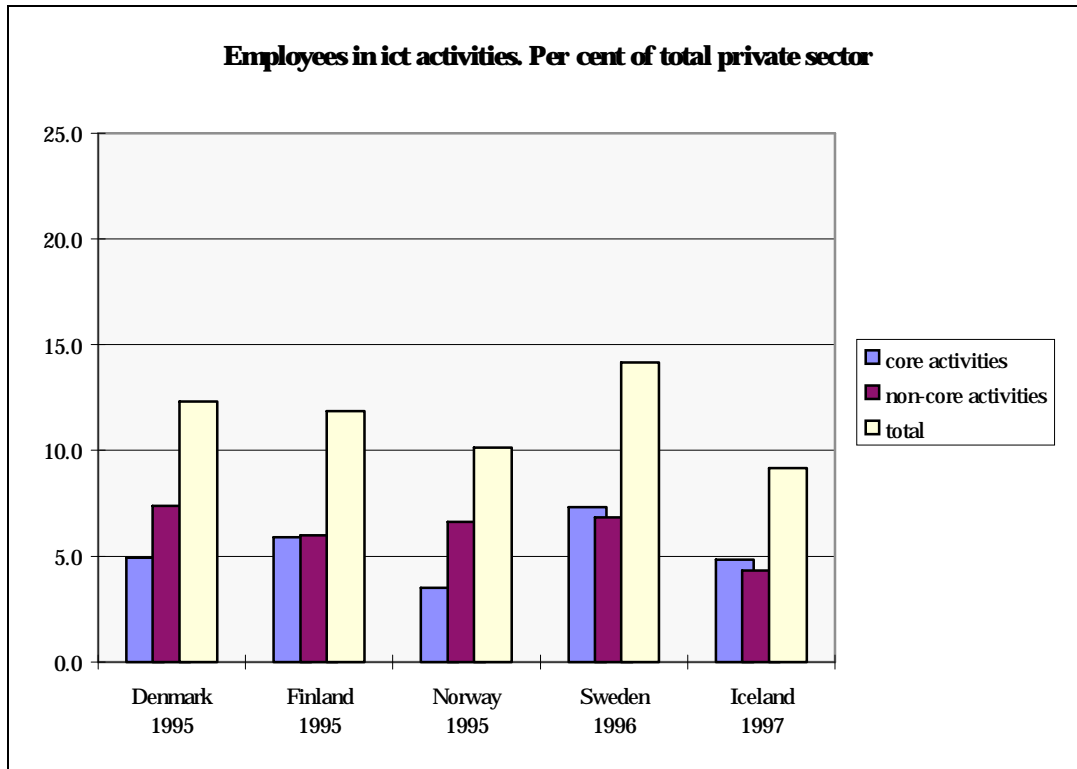
In total, the ITC activities constitute between 9% (Iceland) and 14% (Sweden) of the total employment, so the ICT sector can be judged of relative high and equal importance in all five Nordic countries.

The ITC enterprises generate on average a turnover exceeding the average turnover of all enterprises in the private sector, cf. figure 1.2.

More interesting is perhaps that the ICT enterprises in Denmark and especially in Sweden create a relatively large share of gross value added compared to the employment share. In Sweden, this is especially the case for the core ICT activities, cf. figure 1.3.

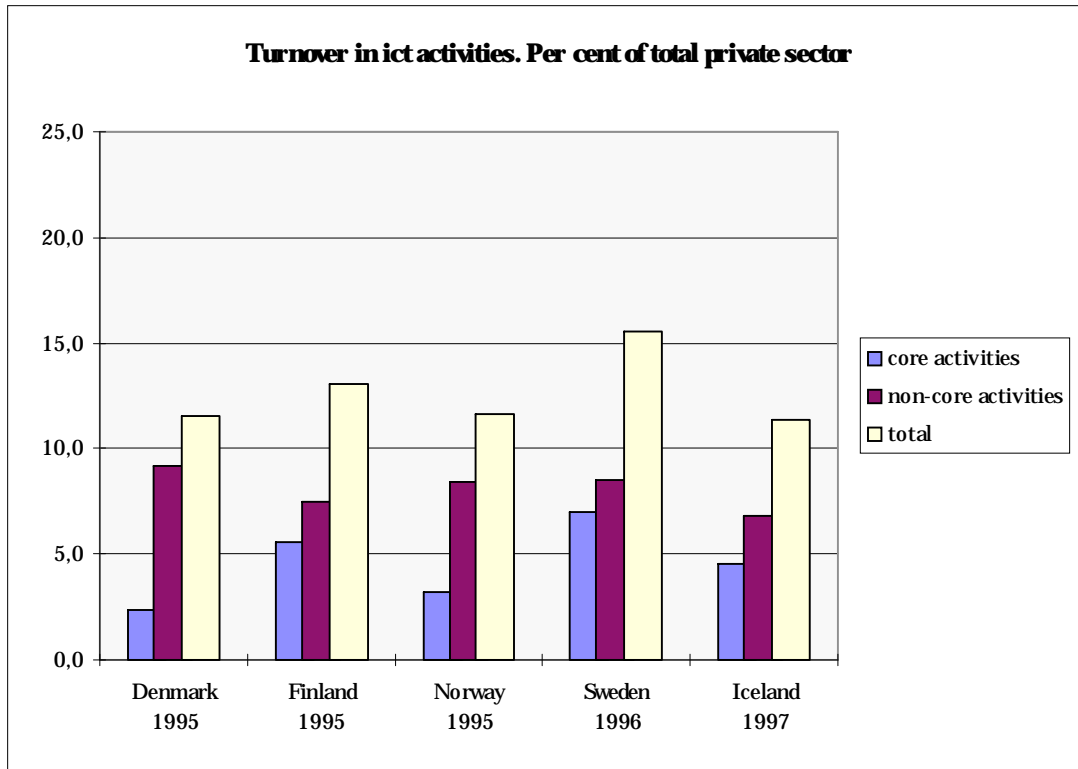
The ICT services industries constitute a relative large share of the employees (13-18%), turnover (14-19%) and gross value added (7-24%) of the services as such. These figures underline the importance of the ICT activities, especially when considering the development and growth of the services sector.

Figure 1.1 Number of employees in ICT activities



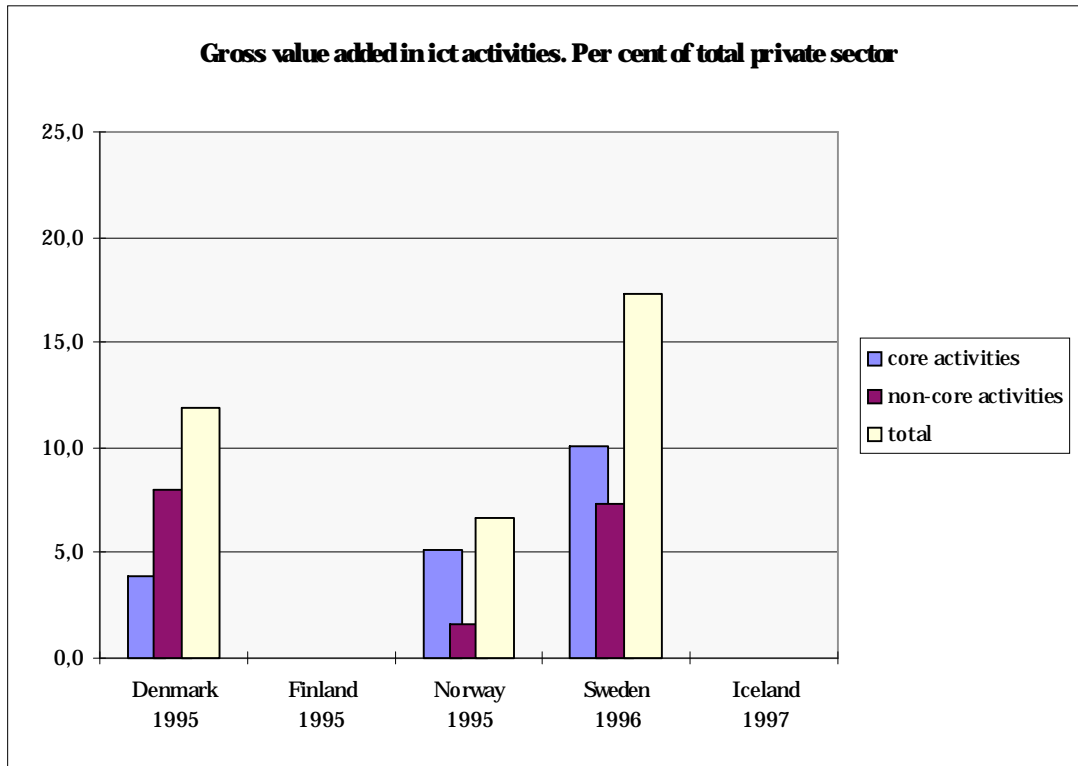
- 1) Denmark: excl. NACE 7310 Research and experimental development and NACE 9220 Radio and television activities (non-core ict activities).
- 2) Norway: Based on number of persons engaged. NACE 9211 Motion picture and video production and NACE 9212 Motion picture and video distribution (non-core ict-activities)

Figure 1.2. Turnover in ICT activities



- 1) Denmark: excl. NACE 6420 Telecommunication (core ict-activities), NACE 7310 Research and experimental development and NACE 9220, Radio and television activities (non-core ict activities).
- 2) Norway: NACE 6420 Telecommunication and NACE 9220 Radio and television activities NACE 9211 Motion picture and video production and NACE 9212 Motion picture and video distribution (non-core ict-activities). Turnover for manufacturing: gross value of production. For services activities

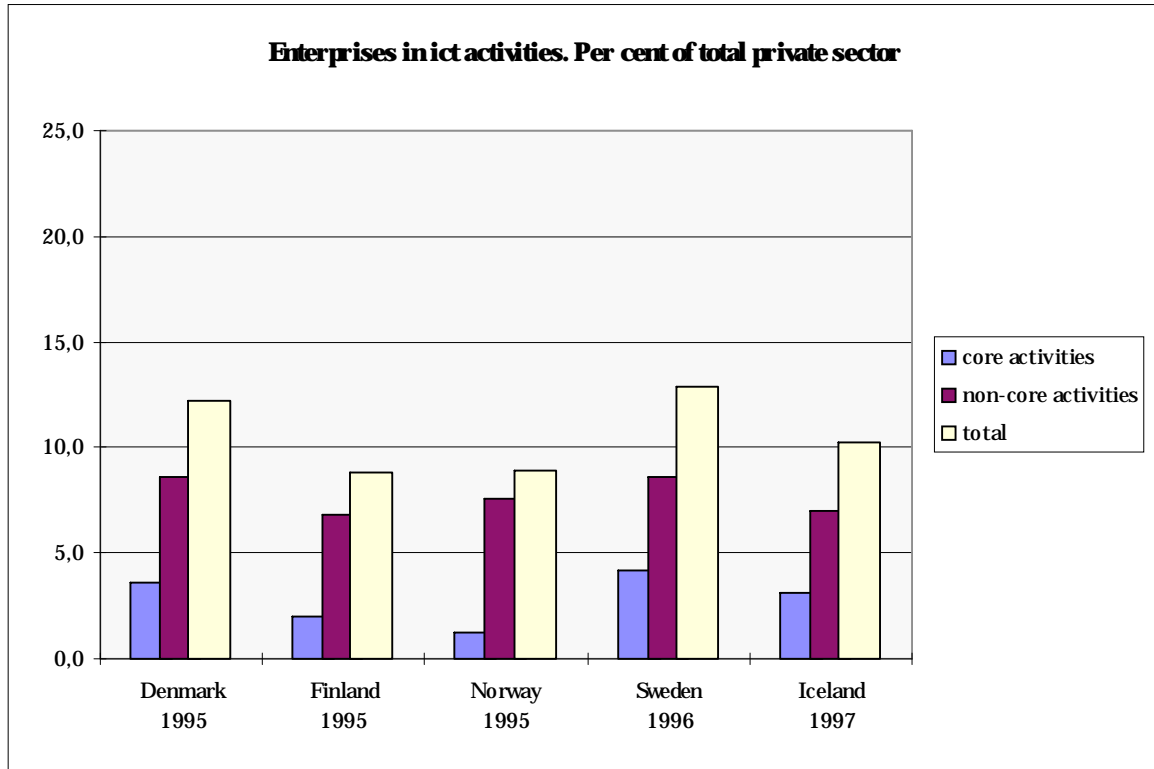
Figure 1.3. Gross value added in ICT activities



Note : Figures not available from Finland and Iceland.

- 1) Denmark: excl. NACE 6420 Telecommunication (core ict-activities), NACE 7310 Research and experimental development and NACE 9220 Radio and television activities (non-core ict activities).
- 2) Norway: non-core ict activities : only covering NACE 9220 Radio and television activities.

Figure 1.4. Number of enterprises in ICT activities



- 1) Denmark: excl. NACE 6420 Telecommunication (core ict-activities), NACE 7310 Research and experimental development and NACE 9220 Radio and television activities (non-core ict activities).
- 2) Norway: NACE 9211 Motion picture and video production and NACE 9212 (non-core ict-activities).

Figure 2.1.a Employees in ICT manufacturing activities

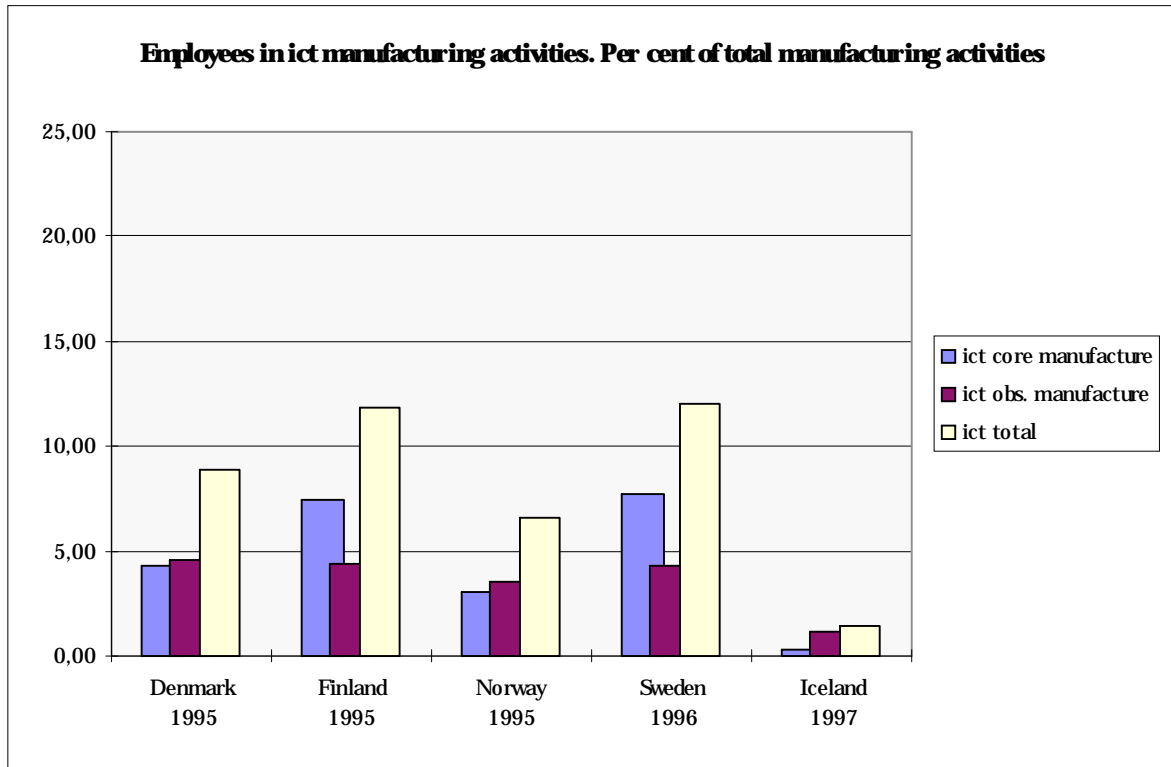
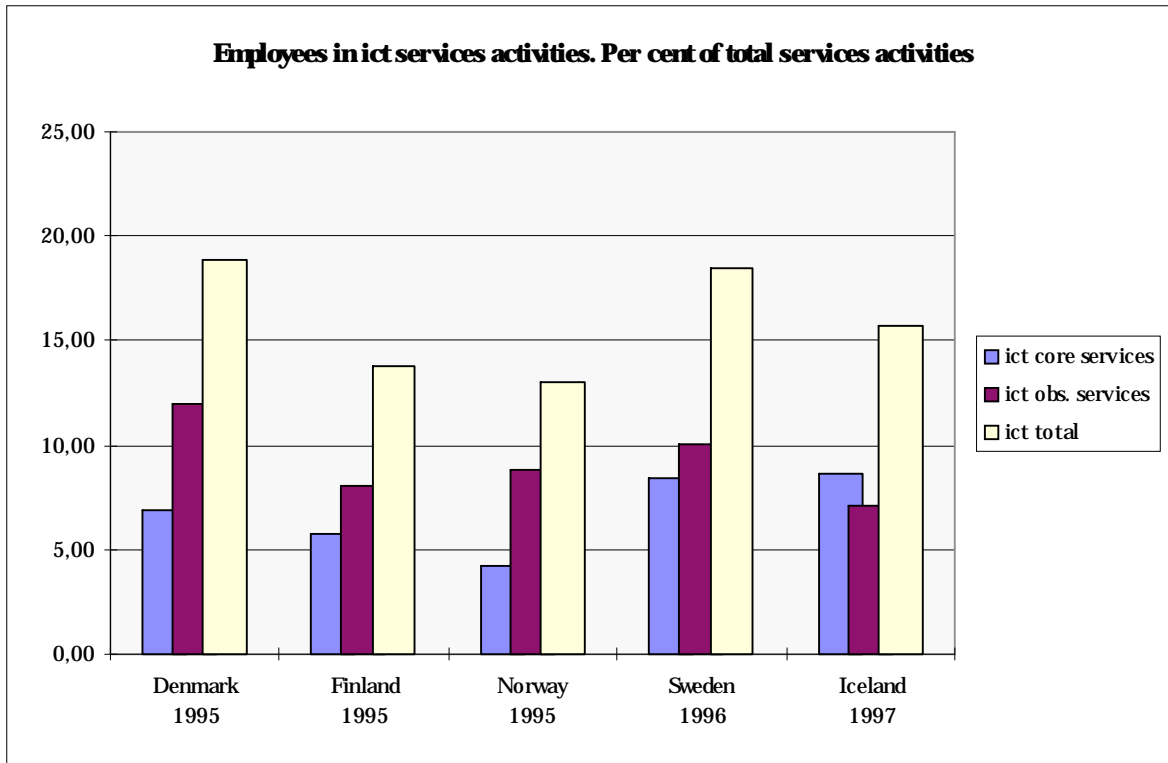
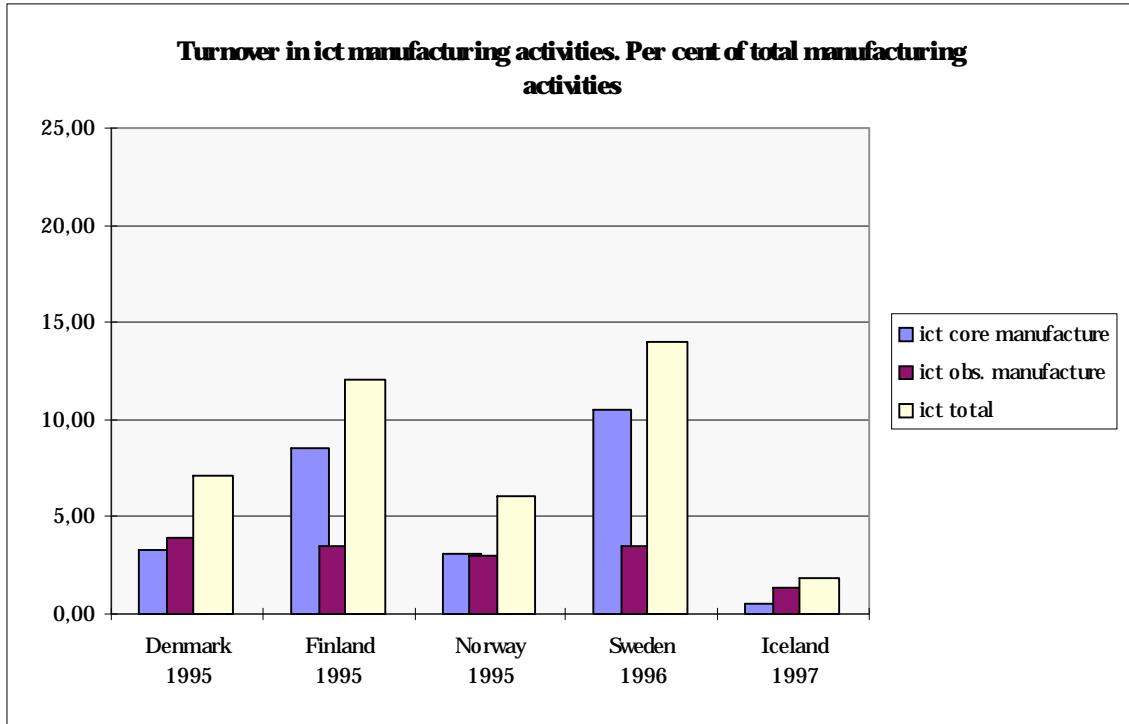


Figure 2.1.b Employees in ict services activities



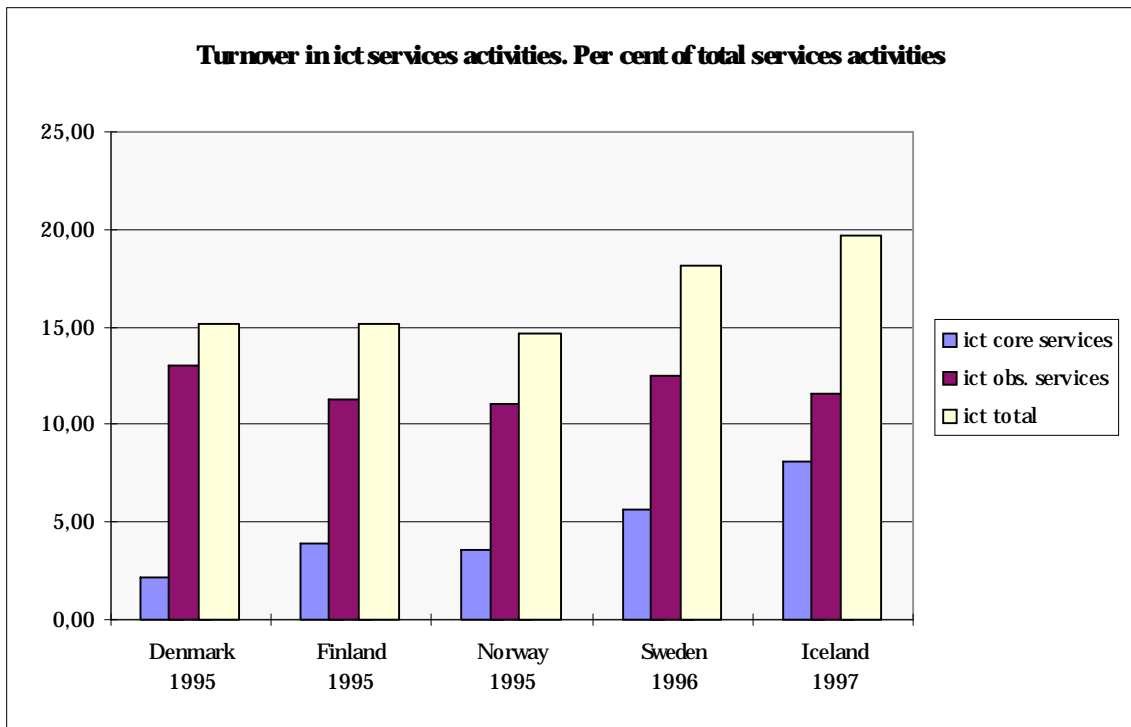
- 1) Denmark: excl. NACE 7310 Research and experimental development and NACE 9220 Radio and television activities (non-core ict activities).
- 2) Norway: Based on number of persons engaged. NACE 9211 Motion picture and video production and NACE 9212 Motion picture and video distribution (non-core ict-activities).

Figure 2.2.a Turnover in ICT manufacturing activities



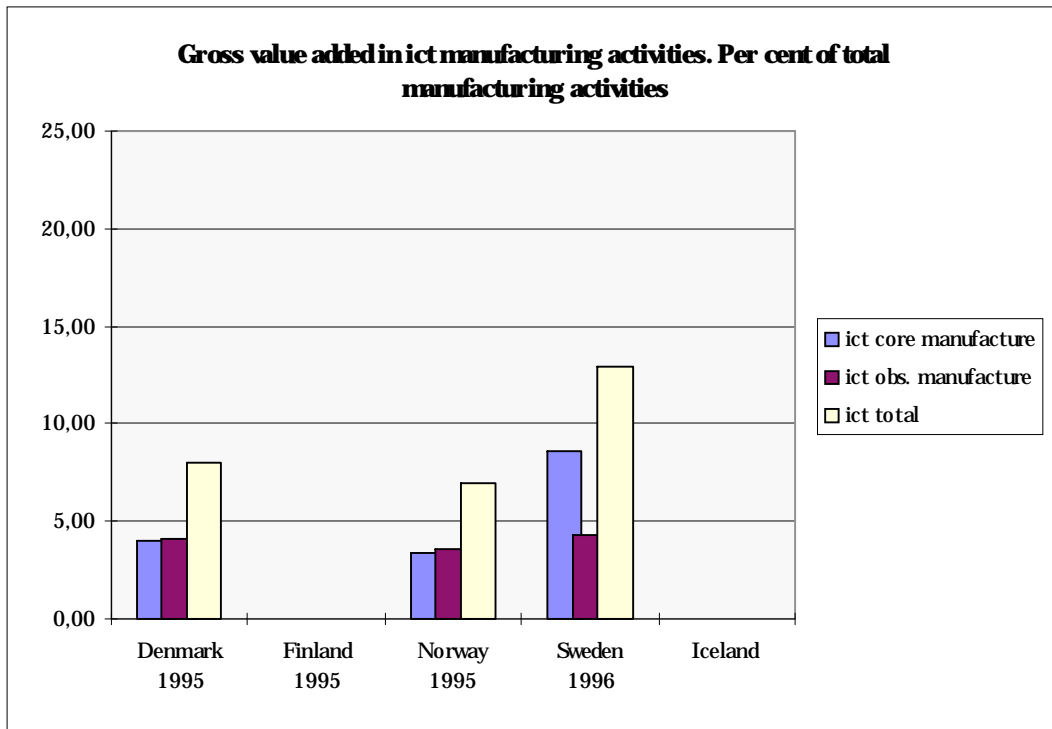
2) Norway : Based on figures on gross value of production.

Figure 2.2.b Turnover in ICT services activities



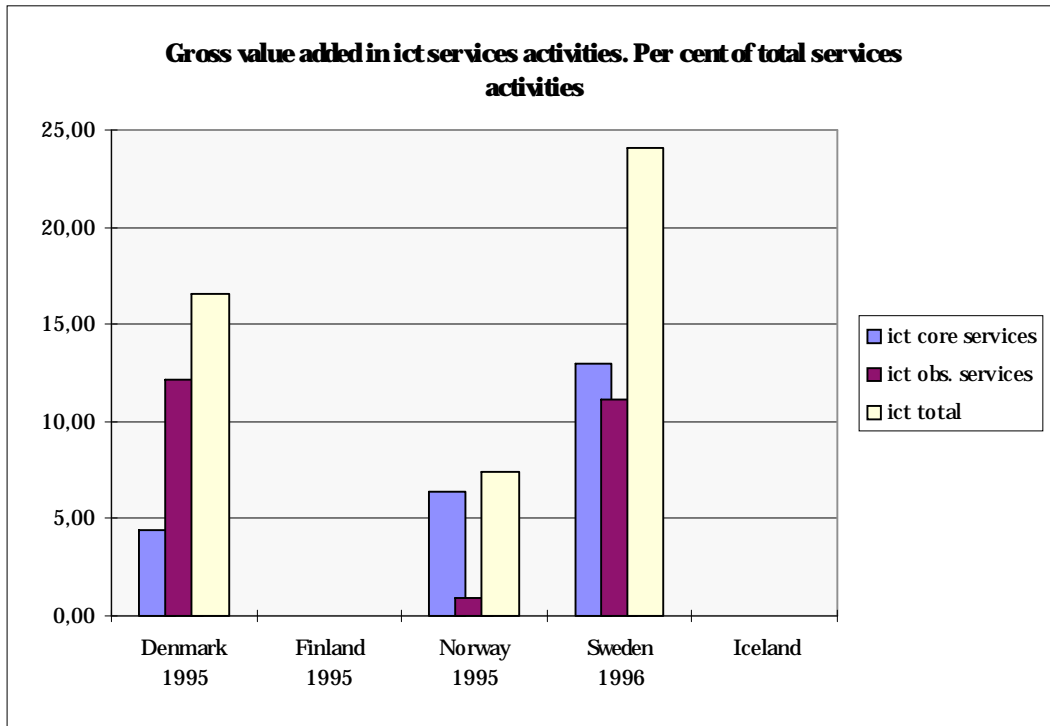
- 1) Denmark: excl. NACE 6420 Telecommunication (core ict-activities), NACE 7310 Research and experimental development and NACE 9220, Radio and television activities (non-core ict activities).
- 2) Norway: NACE 6420 Telecommunication and NACE 9220 Radio and television activities. NACE 9211 Motion picture and video production and NACE 9212 Motion picture and video distribution (non-core ict-activities).

Figure 2.3.a Gross value added in ICT manufacturing activities



Note : Figures not available from Finland and Iceland

Figure 2.3.b Gross value added in ICT services activities



Note : Figures not available from Finland and Iceland

- 1) Denmark: excl. NACE 6420 Telecommunication (core ict-activities), NACE 7310 Research and experimental development and NACE 9220 Radio and television activities (non-core ict activities).
- 2) Norway: non-core ict activities : only covering NACE 9220 Radio and television activities.

Figure 2.4.a Enterprises in ICT manufacturing activities

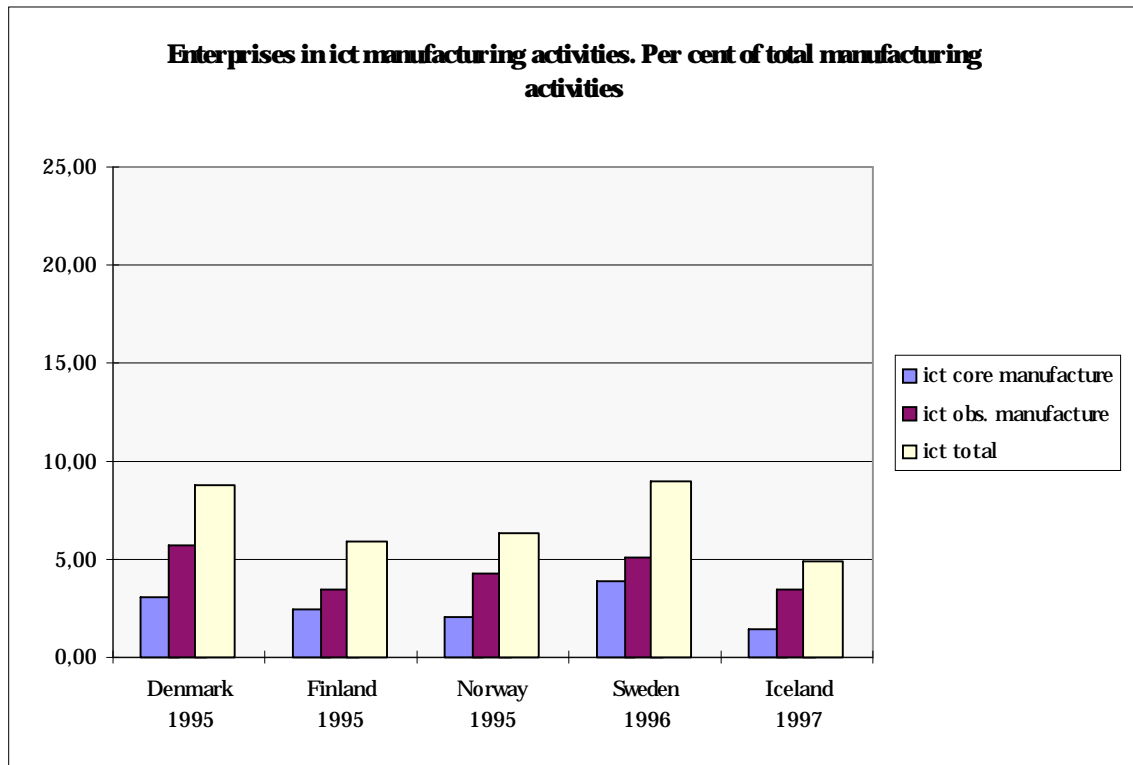
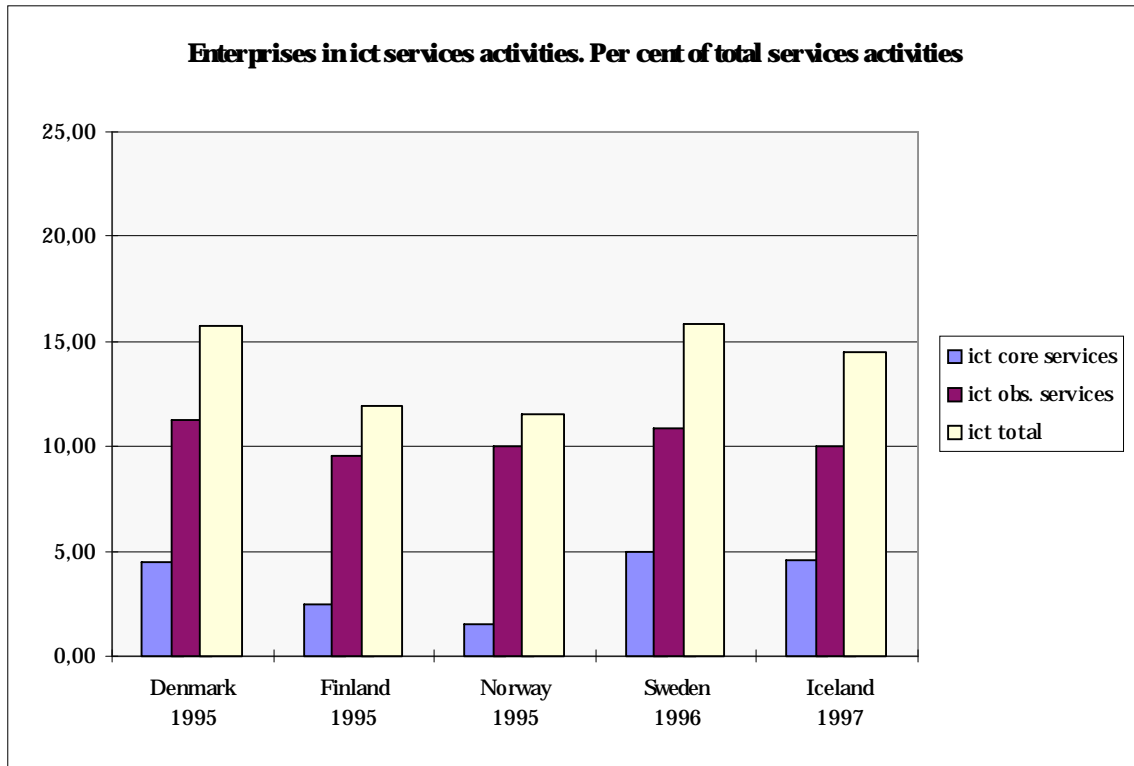


Figure 2.4.b Enterprises in ICT services activities



- 1) Denmark: excl. NACE 6420 Telecommunication (core ict-activities), NACE 7310 Research and experimental development and NACE 9220 Radio and television activities (non-core ict activities).
- 2) Norway: NACE 9211 Motion picture and video production and NACE 9212 (non-core ict-activities).