WESTERN ASIA WORKSHOP ON STRATEGIES FOR ACCELERATING THE IMPROVEMENT
OF CIVIL REGISTRATION AND VITAL STATISTICS SYSTEMS
20 -24 JUNE 1993, DAMASCUS

حلقة عمل غربي آسيا بشأن اعتماد استراتيجيات للاسراع بتحسين
نظم التسجيل المدني والاحصاءات الحيوية
۲۰ - ۲٤ حزيران/يونيو ۱۹۹۳،دمشق

المكتب المركزي للاحصاء CENTRAL BUREAU OF STATISTICS	اللجنة الاقتصادية والاجتماعية لغربي آسيا ECONOMIC AND SOCIAL COMMISSION FOR WESTERN ASIA	شعبة الاحصاء في الامم المتحدة STATISTICAL DIVISION UNITED NATIONS

UN ECONOMIC AND SOCIAL COMMISSION
FOR WESTERN ASIA

JUL 1 3 1993

LIBRARY & DOCUMENT SECTION

DANISH EXPERIENCES WITH
COMPUTERISATION OF CIVIL REGISTRATION

By

Karin Ifanger*
Manager
Data Centralen, Denmark

---

* The views expressed in this paper are those of the author and do not
necessarily reflect those of the Economic and Social Commission for Western
Asia.

* Issued without formal editing.

93-0383

Danish experiences with

Computerisation of Civil Registration

Issued by: Karin Ifanger
                    Manager
                    June 1993

Table of Contents

1. Introduction

A Civil Registration System contains basic data such as name, address, date of birth, sex and family relationships of the citizens in the country. These basic data are essential for any country for statistical purposes and also required by most public authorities to perform their administrative tasks.

In countries without a computerised Civil Registration System the basic data are collected again and again by each public authority independently. The consequence of this is poor data quality in many registers and inability to produce country-wide statistics for development and planning purposes.

Therefore the introduction of a Civil Registration System is one of the most important development projects which a country can undertake. The administrative infrastructure built up by such a system is the fundamental basis for further national development.

This working paper describes the experiences gathered in Denmark during the last 25 years concerning the computerisation of civil registration. The Danish Civil Registration System is developed by Datacentralen, The National Computer Centre of the Danish Government, founded in 1959.

Datacentralen has developed Civil Registration Systems for the Government of Kuwait in 1987 and the Government of Malaysia in 1990.

Dan Software International A/S, was incorporated in Denmark on 21 January 1993 and is established as a 50/50 joint venture between Datacentralen A/S and Mærsk Data A/S. The new company, Dan Software International, have the exclusive marketing rights to Datacentralen's present Civil Registration System and know-how in the public service sector and market this system all over the world.

The descriptions in chapter 3 and 4 are based on this standard system.

2. Historical Overview

Denmark is a highly industrialised country with a population of approximately 5,5 million residents and an area of 42.000 square kilometres. The country is divided into 14 counties (regions) and 275 municipalities with a substantial degree of local government administration.

Denmark is one of the countries in the world with the highest degree of computerisation and integration of public administrative systems. The computerisation was initiated by the establishment of Datacentralen in 1959 as the National Government Computer Centre. Datacentralen has since then developed and operated all major administrative systems for the Danish Government.

The core system of this administration is the Civil Registration System, which was planned and developed for the Danish Ministry of the Interior. Since the system went into operation in 1968 it has continuously been improved, supplemented and modernised.

In **Appendix A** you will find a more detailed chronological description of the implementation and development of the Danish Civil Registration System.

The decision to computerise the civil information was based on the demands of the growing public services and the development of the welfare state. Accurate and up-to date information of the entire population was essential to plan and perform the functions of the administration in an efficient way. Reliable information of for instance each citizen's address, age, sex and marital status is of vital importance when planning legislation, education programmes, health services and other social benefits. The information is naturally also essential to impose and collect taxes and other Government revenues to finance the services to the public.

3. Characteristics of the Civil Registration System

The Civil Registration System is a standard system, with a centralised database containing information on all residents in the country.

The main objectives to be satisfied by the system are:

- to provide an automated system to register, store and retrieve civil information efficiently, securely and accurately

- to supply users of the system with all kind of civil information in an efficient and flexible way.

The system is characterised by:

- assigning automatically a unique civil registration number to each citizen by birth or when he / she as an immigrant joins the system, thus ensuring a distinctive identification of all residents

- being an independent information system from which civil information is delivered to the entire public administration for its specific purposes by using the identification number as a key

- a high degree of security concerning preservation of data and access to data

4. System Overview

4.1. Databases

The main databases of the Civil Registration System are:

- The register containing personal information on the population including the identification number. In addition this register includes the family-links between parents and children and husband/wife

- The address register, which includes coded information on all regions, municipalities, cities, towns, villages and streets of the country. In addition administrative districts such as postal-, electoral -, school -, social -, police -, residential-, are included

Historical information is available for statistical and administrative purposes. In Denmark historical information on all citizens is available back to 1971.

4.2. Main Functions of the CRS

The Standard Civil Registration System includes the following main routines:
- The On-line Update System
- The On-line Enquiry System
- The ID-Card Interface System
- The Unified Coding System
- The Service System
- The Batch Control System
- The Back-up and Recovery System
- The Security System

These main routines are briefly described in the following sections.

4.2.1 The On-line Update System

The On-line Update System is used to update the Civil data base
with changes in the citizen's personal information. Either directly by the local registration offices using their own terminals or centrally based on reporting forms from the local registration offices.

The updating takes place as an on-line terminal dialogue in which the operator will be guided through the process by the system.

A complete format and logical validation check is carried out during the updating, giving clear and understandable messages to the terminal operator, and only accepted cases will update the data base.

The updating system is divided into on-line transactions reflecting the civil events to be reported such as birth, marriage, death, change of address etc. and the corresponding reporting forms.

If the issuance of ID-Cards is part of the system, the On-line Updating System stores requests for producing ID-Cards. The requests are taken care of by the ID-Card Interface System which extracts information of the cards for subsequent manufacturing.

Moreover, the On-line Update System produces output to be used by the Service System for extraction of data for various purposes: Messages, receipts, reports and certificates for the local registration authorities.

4.2.2 The On-line Enquiry System

This system enables the user to make on-line enquiries to information in the Civil Registration data base.

The system consists of two parts:

- enquiry on a citizen using a unique identification
- search by certain criteria

Enquiry

In the enquiry the citizen is directly identified by the civil registration number or other unique identification (e.g. certificate number).

Search

If no unique identification is available the user may select one of the following types of search:

- search by date of birth or age
- search by name
- search by address.

The user may also specify additional information to limit the number of hits, such as place of birth, sex and nationality.

The result of a search is a Search List giving limited information on citizens who meet the search criteria. Detailed information may be requested directly from this list.

Answers

All civil information on a citizen is displayed by a selection of answer screens.

Depending on the type of answer, information on related citizens (e.g. family members) is also presented.

4.2.3 The ID-Card Interface System

The purpose of the system is to keep information on all issued ID-Cards and to communicate with the ID-Card Manufacturing System.

The workflow for issuance of ID-Cards is divided into three parts:

- extraction of data to the ID-Card Manufacturing System, which is an external system
- manufacturing of ID-Cards on special hardware
- registration of produced ID-Cards in order to avoid double issuance of ID-Cards.

4.2.4 The Unified Coding System

The information in the Civil Registration data base relies heavily on the use of codes to identify classified data items uniquely.

Examples of data items to codify are: Countries, cities, streets, districts and registration offices. Code values are also used in connection with personal data such as sex, marital status and citizenship.

To support this, a Unified Coding System is provided which is used to codify all types of classified text data items within the data base.

An on-line enquiry facility enables search, identification and display of all codes and corresponding texts.

The Unified Coding System serves among other things to provide the classified text in more than one language.

4.2.5 The Service System

The Service System is used for selection and extraction of batches of information from the civil registration data base.
Examples of uses are:

- Subscriber extraction

These tasks run daily and extract information about changes to the Civil data base made by the updating system. For example, address changes, name changes, etc.

- Status extraction with key

These tasks run either on a scheduled or ad-hoc basis and extract information to the users from records identified by a specified key such as the civil registration number.

- Status extraction without key

These tasks run periodically performing sequential scans of the data base in order to extract information to the users.

4.2.6 The Batch Control System

When the updating takes place centrally a large amount of registration forms can be expected to reach the central computer site daily in order to be registered and to produce ID-cards.

The Batch Control System is an integrated part of the Civil Registration System with the purpose of:

- Controlling the handling of batches of registration forms received from the local registration offices

- Controlling the status of each registration form monitoring which workstations the form has passed.

Enquiries may be made identifying the process of each registration form and it's present location in the organisation. Statistics can also be developed monitoring the efficiency of the workstations.

4.2.7 The Back-up and Recovery System

The back-up and recovery of the Civil Registration System data base is undertaken by using standard utility programs delivered as part of the Data Base Management System.

In case of break down, the standard recovery system is used to restart the system. It is possible to recover the system up to the last completed transaction.

4.2.8 The Security System

The data access security for Civil Registration System is based on a standard security system, which is part of the Data Base Management System.

Each user of Civil Registration System must have assigned a user identification which authorises him to access certain parts of the Civil Registration System. The identification is combined with a secret password defined by the user himself. The password must be changed by the user after a certain period.

Based on audit registrations automatically created by the updating and enquiry systems the security administration can produce lists for a more detailed follow-up on user accesses to the data base.

5. Organisational Management and Registration Procedures in Denmark

5.1. Organisational Management

The management of the Civil Registration System will differ according to the tradition and legislation of the country. The following is a description of the administrative organisation in Denmark.

In Denmark the full responsibility of the system lies with the Ministry of The Interior. This means that this ministry provides the legislation and the administrative procedures and decides, which data may be accessed by or delivered to other public authorities or private companies according to Danish data protection legislation.

The actual civil information register is placed at Datacentralen and operated by Datacentralen.

5.2. Reporting procedures

The local registration offices, which are established in the 275 municipalities are responsible of all updatings of the system according to the procedures set by the Ministry of the Interior.

To-day all municipalities have terminal-acces to the system and the updating is on-line and real time.

All civil events such as birth, marriage, death are reported to the local registration office by the basic authorities, where the civil event occurs. This means that for instance a marriage is reported by the church or the Mayor's office. The citizen is only responsible of reporting his change of address, when moving into the municipality.

When a civil event is reported to the system all other users subscribing on changes in the civil information register will automatically receive the information.

6. Utilisation of the Civil Registration System

The Danish system is widely used by the whole public administration and by all major banks and insurance companies in the country. Below a few examples of the usage:

- direct terminal access to the register or parts of the register.

Approximately 4000 terminals are connected to the system. One of the main users is the police, which has direct access 24 hours a day:

- subscription to changes in the register.

Approximately all public authorities working with personal information in their administrative tasks receive the changes relevant to their specific administrative functions. To-day 120 authorities have a subscription arrangement.

Private companies are only allowed to subscribe on changes of address for their clients, which are defined by their identification number:

- extracts of the register for statistical and planning purposes.

The use of the register for statistical purposes is described in detail in the working paper of Mrs. Anita Lange, Danmarks Statistik.

All population statistics and prognoses are based on the civil registration system. As the address register contains a number of planning districts, extraction for the planning of for instance schools in a municipality can be delivered. Such an extract would show the number of seven year-old children at any time living in the district.

The computerisation has made population census in Denmark superfluous since 1981. Another service is deliverance of voters lists in connection with general and local elections.

In **Appendix B** is a list of the actual Danish Government authorities using the Civil Registration System.

7. System Implementation

As described in chapter 2 and Appendix A the computerisation of Civil Registration in Denmark has been a lengthy and still on-going process to reach the actual situation, where the full benefits and substantial savings and rationalisation of public administration is obtained.

It is our experience, that the planning of the system implementation in accordance with the individual country's circumstances is of vital importance. Therefore the first step should be the establishment of a clear and detailed plan for the implementation i. e. a Masterplan.

The creation of a Masterplan requires careful and dedicated analysis of the present registration of vital events of the country in question in order to define the needs and requirements to the system.

Appendix A.

Civil Registration in Denmark Chronological Overview

In 1924 the local registration offices were established by law in all municipalities. The main purpose was to enhance the collection of taxes and other revenues of the municipalities.

Previous to this civil events such as birth, death and marriage were registered in the church books. By the act of 1924 the registration was based on the home addres of the citizen and all basic authorities, such as churches, the county (divorce) and hospitals (death and birth) were obliged to report to the local registration offices.

The registers were originally based on a census and changes to the information done manually. The information was divided into 3 manual files. A family card-file, a file showing the citizens who had moved from the municipality and deceased, and a file with each citizen's name and address.

The procedures set up in the Act of 1924 were used with only minor changes until the computerisation of the civil registration was decided.

In 1968 the Act introducing the Civil Registration System was passed. The implementation of the system was preceded by a planning period of 3 years, where staff from the Ministry of the Interior and from Datacentralen worked closely together.

The most important changes introduced by the system were:

- The introduction of the <u>unique personal registration number</u>
  which was assigned to all residents

- The establishment of a <u>central database</u> covering the whole
  population

- Introduction of <u>procedures concerning the updating</u> by the
  local registration offices

In the following the development since 1968 is listed.

In 1970 the Service System was implemented. By this system the deliverance of personal information to the whole Government administration was made possible.

In 1977 the municipalities were equipped with terminals.

In 1978 the system was converted from tapes to disques. This made it possible to make daily updatings and thus enhanced the actuality of the register.

In 1981 - 1983 all municipalities and other users were connected to the system by terminals to update or enquire directly.

1988 - 1991

A complete modernisation of the system has taken place. The most important improvements are:

- online and real time updating

- conversion from a hierachical database system to a relational database

- addition of data fields to meet new requirements

Appendix B

List of users of the Danish Civil Registration System

- 279 Municipalities

- The ministry of the Interior

- The Ministry of Taxation and Customs

- The Ministry of Finance

- The Ministry of Defence

- The Police Department

- The Ministry of Labour

- The Statistical Department

- The Ministry of Education

- The Ministry of Health

- The Hospital Authorities and hospitals

- The Ministry of Social Affairs

- The Institute of Social Sciences

- The Ministry for Postal Affairs and Telecommunication

- Private banks and insurance companies