



**Economic and Social
Council**

Distr.
GENERAL

CES/AC.71/1999/18 (SUM)
2 December 1998

ORIGINAL: ENGLISH

STATISTICAL COMMISSION and ECONOMIC COMMISSION FOR EUROPE

CONFERENCE OF EUROPEAN STATISTICIANS

Meeting on the Management of Statistical Information Technology
(Geneva, Switzerland, 15-17 February 1999)

Topic (ii): Economic issues associated with the implementation of modern IT and management of human resources as driving forces to improve timeliness and quality of statistical data

**SOME TECHNOLOGICAL AND ECONOMICAL PROBLEMS
IN THE IMPLEMENTATION OF MODERN INFORMATION TECHNOLOGY**

Submitted by the Central Statistical Bureau (CSB) of Latvia¹

SUMMARY

1. The modernization of Latvian statistical information technology (IT) was started in 1992 with the help of the European Commission. During the first stage the main focus was on the design and improvement of the overall IT infrastructure. The current project is the improvement of the State Statistical System (expansion/enhancement of survey activity) in accordance with "Statistical Requirements Compendium".

2. In 1998, 154 statistical questionnaires were used for the collection of primary statistical data. These were sent to respondents, mainly to legal entities, and the responses were received by mail. More than 20 thousand respondents were interviewed during one year, not including the register surveys. A number of the respondent forms, mainly from the physical persons, were completed with the help of interviewers. During one year CSB of Latvia

¹ Prepared by Janis Linde and Ilmars Vanags.

collected 151.6 million indicator values for 29,000 statistical units. 24% of these were received electronically; the rest of the data was entered manually. The large volume of raw data, the necessity to carefully check the data and correct errors by recontacting the respondent is the main reason for the creation of decentralized data input and control system.

3. The main objective of the system is to choose an optimal distance between the data source and the place of data registration. Thus, it would be much easier to recontact the respondents, offer them methodological consultations and clarify the errors. The non-response and respondent workload would also be reduced.

4. According to the new IT strategy, the data input, storage and processing procedures and modules will be designed according to a certain pattern. The standardized statistical data production process at CSB will consist of the following main procedures:

- Survey design and preparation (centralized);
- Maintenance of the registers and respondents selection (centralized);
- Data entry and initial checking (decentralized);
- Data validation and editing (decentralized and centralized);
- Statistical data storage and processing (centralized);
- Statistical data analyses (centralized);
- Data dissemination to external users (centralized and decentralized).

5. The methodology of the development of the CSB information system is based on classical waterfall approach, which contains nine major stages. These are: User Requirements Specification; Functional Requirements Specification; System Architecture and Design; Module Design; Coding of Basic Units (sub-modules suitable for development); Coding and Testing of Units; Integration; Qualification Testing; and System Acceptance.

6. In practice, movement between these stages is usually an iterative process. As an example, consideration of architectural design and the constraints imposed by the available IT infrastructure may necessitate changes to requirements' specifications. These will in turn necessitate changes to user requirements, which should be agreed before development continues. Currently, the IT project has completed the third stage: functional requirements have been prepared and the main modules have been defined together with their functions and interfaces.

7. The data flow analysis and CSB business module analysis show that there is a necessity to store, process and analyse data using data warehouse technology. Several object-oriented operational databases for the storage of primary data need to be created, as well as a central aggregated database and a special database for external users.

8. The implementation of modern IT in a statistical office is not a goal itself, but a means to improve efficiency. Different criteria, methods of

calculation of indicators of efficiency, benefits and costs, and necessary conditions should be used depending on the purposes of evaluating economic efficiency of modern IT. The choice of the most efficient IT solutions in statistical office, the estimation of actual or planned efficiency of automation should be based on a cost-benefit approach. Some viewpoints for efficiency of modern IT in a statistical office are as follows: efficiency from the standpoint of the state as a whole and from the standpoint of the statistical office (or other organizations); efficiency of a concrete project and efficiency of activities of the whole statistical office; efficiency for selecting variant, planned efficiency and actual efficiency; integrated effect, yearly effect and average yearly effect; the absolute (common) efficiency and relative (comparative) efficiency; efficiency of the statistical information system, subsystem, survey, complex of tasks, task and technological operation.

9. The appropriate measure of efficiency of implementation of modern IT would be **the accounted rate of return on additional capital investment** (economy of average annual current costs divided by additional capital investment). In order to calculate this indicator correctly, the comparable and base variants should be based on the same input (primary data) and on the same output (aggregated data). The result should then be compared with the required rate of return. The most cost-efficient solution for the implementation of modern IT in the statistical system should be chosen taking into account the expected future costs. The past (historical) costs should be used in the calculations of actual efficiency; they may be an important source for predicting future costs.