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NEW ICT ARCHITECTURE IN THE CZECH STATISTICAL OFFICE – RESULTS OF COOPERATION WITH ICT EXPERTS AND COMPANIES

Invited paper prepared by Stanislav Drapal, Czech Statistical Office

1.   From the historical point of view, use of information and telecommunication technologies (ICT) in the Czechoslovak and later the Czech Statistical Office can be divided into three periods.

A.   Before the mid-1980s

2.   The Czech Statistical Office – and before the end of 1992 also the Federal Statistical Office of Czechoslovakia – used an independent organization to deal with statistical data processing and preparation of outputs on electronic media. The organization used computer technology of that time produced by the countries of the former Soviet Union and German Democratic Republic. The computer technology then was a big mainframe computer. Experts from the statistical office had minimal knowledge on functioning of ICT and they were not in direct contact with it.

B.   Late 1980s and early 1990s

3.   In the late 1980s, a new generation of computer technology emerged in the former Czechoslovakia. It originated from the domestic production of Czechoslovak producers and did not require such a big space. Simpler handling with computers caused that they started to be used more in individual statistical departments and thus not only ICT experts had access to them.

C.   Since the early 1990s

4.   In the beginning of the 1990s, and since 1993 in the independent Czech Statistical Office (CZSO) a new ICT generation was established. Changes in the field of ICT as well as in political, social and economic life after 1989 led to substantial changes in the quality of ICT. The CZSO was equipped with a large number of PCs. In the second half of the 1990s, every CZSO employee had a PC and other related technology. A fundamental change in quality in the specialized IT department also took place, which ensures since then the processing of data and their electronic dissemination. Printers connected to PCs, fax machines, copying machines and scanners became a common part of the equipment of our workplaces. A key change occurred in the approach of our employees, who started to consider their PC to be one of the basic instruments for their ordinary work.

5.   The substantial resources spent on ICT development in the CZSO resulted in a quantitative increase of the technology. Requirements for greater effectiveness of activity of the entire CZSO were naturally also reflected in the ICT area. The question arose whether it is necessary to have such a big amount of equipment and whether it is possible to regularly renew that amount of technology in view of budget restrictions. The search for answers to those questions collided with the effort of employees to keep the status quo. Therefore, the CZSO top management decided to involve external experts in analysing the real needs of the office in the field of ICT; the experts were to elaborate concepts for further development and design of optimal equipment with ICT from the point of view of the fulfilment of tasks of quality, effectiveness and safety of work with data. The CZSO started to regularly and permanently communicate with the suppliers of equipment for ICT, with suppliers of software and, especially, with suppliers of analyses, who deal with improvement of the ICT environment. That cooperation allows reviewing the CZSO needs from an objective point of view; it evaluates the current situation objectively and eliminates pushing of opinions and partial interests of individual employees or units of the CZSO. On the other hand, it makes demands on providing necessary information to those companies, precise definition of tasks for their activity and it is demanding on the budget as well; to ensure observance of the rules of the competitive environment is also necessary.

6.   The results of the cooperation with the external ICT specialists lead toward three main areas:

   (a) **Thinking of people**: in the 1990s, distrust of people in relation to ICT was rapidly overcome. However, some people still tend to believe that an employee must have all ICT instruments directly in his or her office. Command of new properties and functions of ICT has slowed down.
   (b) **Organization of work and organizational structure**: implementation of new ICT generations with new properties and the requirement for effective utilisation of ICT enables the more effective organization of work and organizational structure and, sometimes, it even necessitates changes.
   (c) **Impact on the budget**: ICT expansion is very demanding on the budget. However, continual improvement of ICT enables at the same time to improve effectiveness of the organization of work and thus also the greater effectiveness of the functioning of the entire office.

7.	In its cooperation with external specialists, the CZSO focused during the last 2-3 years on a solution for five basic areas.

8.	**ICT concept** - Analysing the devices and technologies used as well as the organization of work with ICT serves as an important background material for updating the current concepts and for the preparation of new ones. The ICT concept is naturally linked to the concept of development of statistical activities. ICT offers statisticians new possibilities both for the collection of data and their processing as well as for the dissemination of the resulting data and information. On the other hand, statisticians (while preparing their concepts) have their requirements as to what ICT should ensure for the needs of the effective implementation of surveys, fast and good quality data processing and the provision of the resulting data and information in user-friendly ways.

9.	**ICT as a service for others** - Statisticians and ICT experts are equal partners influencing each another. ICT is not understood as a service but rather as a servant. Statisticians express their needs from the point of view of statistics and ICT experts propose how to realize them in the best way by necessary devices, programme equipment and other ICT elements. While presenting a draft concept solution, ICT also has to take into account demands on the budget and, eventually, to suggest such solutions that will satisfy the user's (statistician's) needs that are realistic from the budget point of view. Similarly, ICT also provides a service for other units and activities, which ensure the functioning of the CZSO statistical departments. This applies, most of all, to the service that maintains records on human resources, records and control of all costs, including costs by individual kinds of activities or products, services for employees in the area of catering, parking, entries, etc. ICT is then a decisive unit for solving all the questions related to data safety from their collection up to their provision to our users.

10.	**Relations with suppliers – outsourcing -** In the development of ICT usage up to now, there was a prevailing tendency to purchase hardware, while in the area of software we were mostly relying on the capacities of CZSO employees; only a small portion of programmes were ordered from external suppliers. This organization of work depends on the CZSO's ability to take advantage of the capability of its own specialists for programming. However, in the CZSO it is not possible to pay those specialists in the governmental sector the same wages offered in the commercial sector. Thus, the best specialists are leaving the CZSO for the private sector. For this reason the CZSO has to seek the optimal utilisation of outsourcing, especially for the creation of special programme equipment. The advantages of external suppliers are their speed, quality and sufficient capacity. Their disadvantages, on the other hand, are lack of knowledge of the CZSO environment and long-term experience with specific requirements of individual users within the CZSO. What also has to be taken into consideration are safety of work with data, safety of databases and solution of dependency of the CZSO on a single supplier. In view of the increasing share of outsourcing, it is necessary to profile new specialists within the CZSO, whose task is to define requirements for suppliers and guarantee correctness and quality of supplies taken over. However, outsourcing is developing also in the area of care of ICT. Nowadays, for example, the option of complete outsourcing of the ICT service in specific circumstances is being analysed, because the CZSO (besides its headquarters) operates in 12 places throughout the Czech Republic. A crucial question that needs to be answered regarding outsourcing is whether the CZSO should own the computer and communication technology

devices or to lease them. This is an important decision that also depends on the rules by which the governmental sector is financed in the Czech Republic.

11.   **ICT and statistical activities** - All statistical activities in the CZSO involve the use of ICT. However, new possibilities of using ICT are emerging all the time. For example, at present, it is the preparation of a new solution for electronic data collection. Up to now, a respondent had to ask for a CD Rom with the relevant programme; that way is not user-friendly as opinion polls among respondents suggest. Therefore, a brand-new solution is under preparation that will enable respondents to access electronic forms within the CZSO database. That new solution is very demanding on ensuring the safety of data during their transmission from the respondents as well as for the protection of data that were already saved. The CZSO expects external experts to participate both in the preparation of the concept for that solution as well as for its realization.

12.   Another crucial area for ICT usage in statistical activities is the dissemination of data and information. The CZSO's long-term policy is to enable the broad public to have access to statistical products via the Internet. Thus, almost all data, publications, public databases, public parts of registers, classifications, metadata and other products are placed on our website. The continual growth of the number of visitors to our website (www.czso.cz) confirms that it was the right decision, together with the increasing amount of information on the CZSO website and the growing complexity of the search possibilities ensuring the necessary capacity for the access of users. Of equal importance is ensuring the reliability of functioning of the Internet access. Again in cooperation with commercial companies, the high reliability of the access to the CZSO website is ensured together with the drop in the time needed for the elimination of eventual defects. In 2005, in cooperation with an external company, we made accessible a "blind friendly" version of the CZSO website. Thus, the CZSO became one of the first organizations of the governmental sector in the Czech Republic that enables access to its services via the Internet also for the blind or sight handicapped.

13.   **ICT for the needs of the CZSO -** Gradually, internal ICT services have been expanging in the CZSO. In cooperation with an external company, a complex programme was introduced in 2002 that serves the needs of the Human Resources and Wages Department – it keeps data on employees, their training, records of working hours, payments of wages and bonuses, etc. Within the services for employees, a system was introduced that enables the use of chip cards for an entry to individual premises of the CZSO as well as other functions. Chip cards contain differentiated authorization for an entry to various premises of the CZSO. At the same time, they serve as a payment card for payments in the CZSO canteen. With the development of the system, other functions will be made available, especially for using a PC to approach data.

14.   Our update task is the currently running realization of the Data Management System for the control of document flow. The system already includes preparation of internal documents and their utilisation. It is being developed again in cooperation with an external company.

15.   Activities of the Czech Statistical Office are no longer possible without the utilization of ICT. There are many conditions for ICT usage. Among the main ones are forming opinion and approach of employees to ICT. Another factor is the budget limitation. Searching for an optimal solution within the existing limitations is something the CZSO cannot do just by itself. Our experience shows that it is very useful when experts from ICT companies participate - in

cooperation with the statistical office in the solution of ICT development for the needs of the statistical office.