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Topic (i): Management, organisation and policy issues

**MANAGEMENT, ORGANISATIONAL AND POLICY ISSUES  
RELATED TO ELECTRONIC DATA REPORTING IN  
THE STATISTICAL OFFICE OF THE REPUBLIC OF SLOVENIA**

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**Invited paper**

**ABSTRACT**

The paper concentrates on the strategies used to migrate research results into the production environment; it also deals with testing while maintaining the regular production, and coping with rapid changes in information technology. Three projects from the Statistical Office of the Republic of Slovenia (SORS) are presented as cases, with problems and solutions also discussed. The first project (EDI-FIN) is from the field of electronic data collection, where data are taken directly from the enterprises' financial records using experiences and tools from the Eurostat TELER project. QUESTIONATOR is the second project related to the subject of maintaining the process of data management in the input division of SORS. The third project is related to the integrated approach of Ministry of Education, Science and Sport and SORS in building the integrated web-based collection of data on upper secondary education. The above-mentioned projects have exposed several management, organisational and policy issues. Some of them are: integration of the needs of several public institutions and possible future arrangements, problems of outsourcing the electronic data reporting (EDR) of NSIs, promotion of EDR and education of data respondents and internal staff, coping with transition period, challenges and possible obstacles for NSIs when understanding and using the current and future possibility of accessing data from electronic networks, data protection issues, etc..

**I. INTRODUCTION**

1. The development of the information society, supported by modern information communication technology, offers official statisticians many new challenges: to collect data of a better quality in a less expensive way and, of increasing importance, timely information. The international meetings, preferably between IT experts and their managers, have been organised and strategic and technical issues have been discussed. It might be recognised that there was less involvement of subject-matter statisticians and general managers in the above mentioned discussions. It also might be observed that EDR should increasingly become the issue of concern of statistical units at NSI level in order to fully explore the possibility of modern technologies. Parallel to that, attention has to remain focused on the content of management and further methodological development.

2. The authors of the paper would argue that the new approaches have been faced with the "present" organisational and statistical culture and increasing tension from the data respondents to lower their

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burden. Increasing nonresponse calls for immediate action, i.e. to employ the possibility of using the information and communication technologies (ICT) more in-depth in the near future, following the ongoing processes of standards and recommendations accepted on the formal and also semantical level.

3. The strategy in EDR has to be supported by a top management commitment clearly explained to the data respondents as well as to internal staff. It also has to be part of the overall strategy on national and international levels.

4. The Bureau of the Conference of European Statisticians (CES 2001) brought the issue to the attention of the Conference in 2001, noting that ICT requires a strategic and comprehensive stance in developing pertinent programmes and policies for improving the collection, processing and dissemination of official statistics. The major issue of the work in this area is the development of standard classifications, methods, norms and metadata concepts, as well as other tools that allow national and international statistical activities to be fully integrated in and adapted to the rapidly changing new ICT environment, and especially to the growing role of Internet.

## II. BACKGROUND

5. Issues on the set up of electronic reporting, organisational issues, management and technical support (hardware and software tools and systems) have a respective history in SORS. The first time that the data were collected from all large- and medium-sized enterprises on diskettes for the Employment Census was in 1986. As register-oriented statistics, the use of administrative records mainly in electronic form began in 1971.

6. In 1997, the initiative "Enterprise our partner" was started. The idea was to reduce the primary reporting burden of the enterprises. Consideration was focused on extensive usage of the administrative sources - optimisation of statistical needs, harmonisation of the questionnaires' contents (Krizman 1997), introduction of modern technologies and setting up the EDR standards.

7. The project TELER was very timely. Slovenia joined the project, participated in and conducted (as did other EU countries) trials and the evaluation of the process and software called EDISENT (Electronic Data Interchange between Statistics and Enterprises), which was developed at Statistics Netherlands. In the scope of the project "Enterprise our partner", a test of electronic data collection and of the software was executed. For SORS, whose participation in TELER was on a voluntary and non-subsidised basis, the aim of the test was initially to check the possibility of conducting electronic exchange of data among enterprises and SORS. The process is based on the definitive fine-tuning between statistical needs (electronic questionnaire with methodology) and internal databases (off-line) of enterprises. The EDIFACT (RDRMES) standard for message structure and electronic means for the message transport was used.

8. We are also satisfied with the two-year cooperation with enterprises in the project of electronic reporting for statistical purposes (EDI-FIN). The positive response of enterprises and their willingness to cooperate in electronic data collection is for us an obligation to further develop and spread electronic data collection among enterprises and SORS.

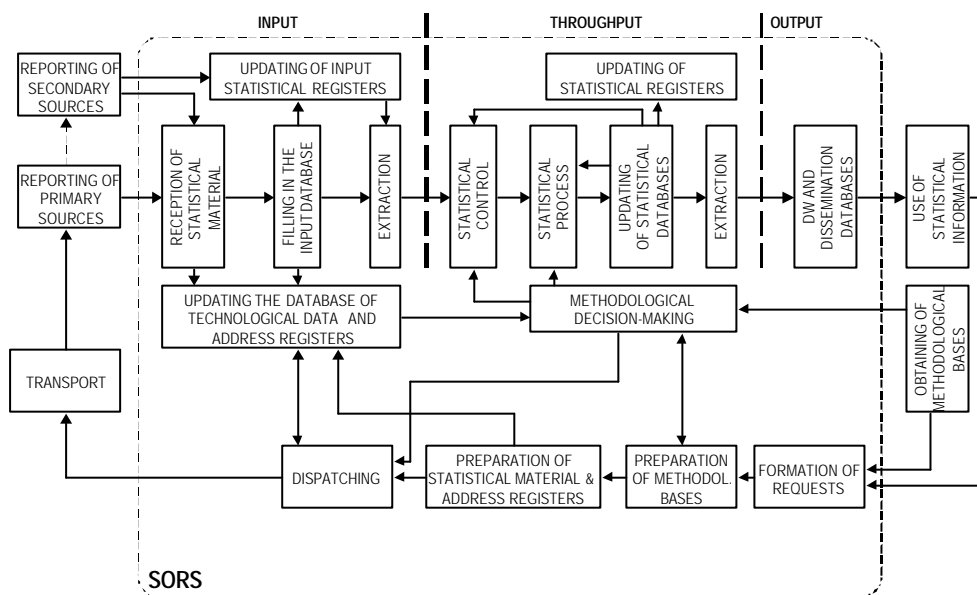
9. Electronic exchange of information and data will become the prevailing method of communication between governmental institutions and the economy. The project on upper secondary education (SOL-S) can also be estimated as a successful implementation of the EDR strategy between governmental institutions.

10. We will strive for e-collection to become one of the most important methods of data collection. It saves time and money, because data collected through electronic questionnaires are more reliable as unavoidable human mistakes occur when answering paper questionnaires and retyping data from paper

questionnaires to computers. Paperless procedures, overall content integration, standardisation, quality and security are considered to be among primary strategic policy issues in SORS.

### III. THE OVERALL PROCESS AND TECHNICAL INFRASTRUCTURE IN SORS

11. The diagram below represents the overall process in SORS. Basic functionality inside SORS is presented in three steps. Input is focused on the outside world of SORS. The data are collected and represented as received, linked and stored. Data security and archiving is crucial and in focus. From input, data are exported with metadata, classifications and processing data along to the next step, the throughput. This is the heart of SORS. Data are processed by statistical editing, imputations and other statistical means (algorithms, SAS tools, etc.). The results are deindividualized and transferred further on to the output. Dissemination of all kinds, on paper, web applications or other means are customer-oriented and secured by carefully selecting dissemination data.



12. The process described is supported by the infrastructure at SORS: LAN, computer systems and communication systems. The SORS LAN is part of HKOM - the governmental network. It is a highly secured network, administered by the Centre for Informatics (governmental agency). HKOM uses leased and dedicated lines, routers and the firewall to the Internet. SORS servers are invisible to the HKOM users. Data, systems and applications running inside the SORS LAN are safe and secure. Internet servers are located in the common, protected area of the governmental network. The second firewall protects the SORS servers inside HKOM. The procedures and application design allow protecting of individual data or misuse of data.

### IV. THE EDI-FIN PROJECT

13. The pilot within the TELER was very successful and evaluated as a distinctive step in the proper direction. Considerable savings on the respondents' and collectors' side were proven. It became clear that the new approach requires changes in NSIs and in enterprises. After trials, and upon the first excitement based on the recent success (followed by a certain sobering up), the decision was made to follow the path of offering electronic reporting. The project EDI-FIN was introduced. The issue was to harmonise several questionnaires on financial statistics (the best organised databases in the enterprises, following the same basic standard) and to introduce the electronic combined questionnaire EDI-FIN.

14. The aim of our project EDI-FIN was to offer enterprises electronic reporting instead of paper reporting. We focused on separate reporting units, which were prepared to cooperate in our pilot scheme and which complied with conditions for electronic reporting. Two thousand enterprises (with 10 or more employees), which employ about a quarter of all employees in Slovenia, received an invitation to cooperate in the EDI-FIN project in April 1999. We made official contact with directors of those enterprises and after their decision to cooperate or not in the project, we made personal contact with the contact person. 162 enterprises decided to be involved in the project. In order to present electronic collection of data with the EDI-FIN electronic questionnaire as an easy and user friendly instrument, we decided to organise seminars for the involved enterprises. To begin with, we carried out the training for trainers. We chose internal and external trainers, but after a few seminars we realised that our internal staff is much more appropriate for trainers. As well as their technical knowledge, they have the theoretical knowledge required to fulfil the questionnaire and they are committed to SORS, so they can better present electronic reporting for statistical needs as an advantage for enterprises.

15. Representatives of participating enterprises learned how to install the EDISENT software, to tune the questionnaire with their export files, to answer the questionnaire and to send it back to SORS. At the end of the seminar, enterprises were sufficiently knowledgeable to make all necessary arrangements required in order to use the software at their workplace.

16. After a few seminars were held, we realised that the best solution was not only trainers but also representatives of enterprises, to compose mixed teams. Our trainers came from the IT sector and from the sector for business statistics. Representing enterprises were both an accountant and an IT expert, as an IT person has no problems with software and an accountant is necessarily very knowledgeable about accounting. For faster and better communication between reporting units and the SORS, we established an e-mail address where reporting units could address their questions concerning installation of software, tuning of questionnaire, methodological explanations or other problems. They could also send their suggestions. Enterprises received, together with software, two electronic questionnaires - one for statistical needs and the other one for their own needs - as a present for cooperation with SORS, to stimulate and promote electronic reporting.

17. SORS conducted a survey on problems related to electronic reporting. With the aim of finding out the reason for the low response rate and increasing the number of reporting enterprises, we contacted the enterprises that attended the seminar and asked them to cooperate in a short opinion poll about electronic reporting for statistical purposes. The survey proved that many of the enterprises were not yet able to send data electronically due to technical (system and communication upgrade) or organisational obstacles. Something new is usually accepted with reluctance. To overcome this obstacle requires the support of top management within the NSI and enterprises. Primary reporting can be less troublesome and more reliable with higher speed and accuracy expected, but a greater knowledge is needed of data processing and databases in the enterprises. This knowledge has to be implemented in computerised interpretation of the data received in the internal databases of the NSI. Much closer and more in-depth contacts between NSI and enterprises are needed.

18. During the implementation of the pilot project, we focused on improving electronic data reporting, abandoning paper questionnaires for those enterprises that were successful. About 10% of the enterprises that participated in our seminar have already abandoned paper questionnaires and are reporting only electronically. One of SORS's future tasks will be to introduce the electronic signature and to provide better protection of electronic messages sent by e-mail.

19. It became clear that electronic reporting could not be a solution to all data collection related problems. Moving from paper to electronic reporting, we developed the process of integration of EDR into the standard statistical procedures. At the moment we are using temporary solutions, but in order to harmonise different procedures into one overall process appropriate for every kind of reporting, some organisational and technical changes will have to be made. We have to adapt the interior environment in the SORS to the electronic method of data collection. The existing methods of dispatching and collecting

reports from reporting units suited paper questionnaires. The automation of message receiving was set up with data transfer into the input databases. Further procedures, such as logical controls of acquired data and storage in SORS's databases, are almost the same as they were before, containing only some adaptations.

20. It is important to be able to collect the required data independently from a technological point of view. To practice the slogan "let's be respondent friendly", the NSIs have to develop proper process and technologies. It is up to the enterprises to decide what technology they are going to use to fulfil the requirements of the NSI. They must decide which technology is better and easier for them (paper, EDISENT, web questionnaire, CATI, direct reporting, etc.). SORS must be very flexible towards enterprises, which are important because their data are necessary. A more in-depth possibility of who is reporting for whom must be offered (headquarters or service partners - accounting offices or contractors).

21. When SORS offers enterprises a new technology or method for reporting, it is important that they maintain this and not give it up after a while. For this reason, SORS must choose new technologies and solutions which provide support and development for the future. They must also consider training requirements when accepting new technology. Training has to be simple and convenient for a wide group of enterprises.

## **V. THE PROJECT QUESTIONATOR**

22. The Q (Questionator) was purchased as a part of the STATCOP 98 project (Country Operational Project). It is the technology to modernise the process of publishing (printing, addressing and sending) of the questionnaires, regardless of the format: paper (letters with questionnaires) or "looking the same" on the web page. The focus is on the questionnaires, and is not suitable for the EDISENT process (tuning to the internal databases in the enterprises is neither optimal or possible).

23. The local contractor was selected. The contract covered purchase (hardware and software), installation, provisional acceptance testing, training and 2-year free maintenance. In that way SORS can be directed in setting up production with little claims to internal system support.

24. The software package "Questionator" contains software for an application server system. It consists of a main server application suite named "Questionator" with client modules known as "Qreator", "Qestor", "QForm" and "Qadmin". The software package also contains several additional system utilities, web server and an integrated SQL database server.

25. The whole system is a stand-alone utility which processes all web requests and when connected to Internet allows both Intranet and Internet users (respondents) to access the parts of the system to which they are privileged.

26. The Qreator is dedicated to the creation of documents. The creation of questionnaires is possible if the internal metadata database is completed (question's definitions) or if JDBC with external metadata database is enabled. The content definition of the document is the initial requirement. Interactive work of the operator is added to the content definition to finish the document creation. The XML language is used for internal representation of the documents. Management of the documents is easy, safe and transparent via the document database. The saved documents can be viewed, saved, edited and printed either as specimens or as blank documents. The verified digital record of the document in the database is the input to the job processing.

27. The administration module Qadmin is the interface to the administrator for process controlling, and for management of the system settings and setting of the users' privileges.

28. The module Qestor is about job processing. The job is the processing of the address database linked to the single questionnaire. In the database, the data are stored regarding who is reporting for

whom, when, etc. The software processes the input data and creates batches of documents (PDF) and envelopes to be sent, publishes the questionnaires on the web, sends the invitations to respond by E-mail to the web reporters and returns status data about the job. If several jobs are launched simultaneously, the processing is optimised to the minimum envelopes printing. Several documents are collected (if possible) in the same envelope. The responding unit receives all the processed documents at once in the same shipment.

29. Qform is the module dedicated to web reporting. Loading of the questionnaires is automatic, based on the definitions in the address database. The questionnaire looks the same as a paper questionnaire. Validity of the personalised questionnaires, access rights and filling in are automatically controlled. Logging in of the user is required. The initial (empty, but personalised) questionnaire can be printed, completed and sent by mail as an ordinary paper questionnaire. Or it can be completed, printed and sent by mail. If the completed questionnaire is sent electronically, the data are mapped into the EDIFACT message and sent to the E-address (EDI SURS server) automatically.

30. The system architecture is a classic three-tier-server-client application which communicates with the standard Wintel PC or Macintosh clients over the TCP-IP protocol, (secure http, ssh, optional: ftp, samba.) through the browser or in some parts also through the client (again over TCP-IP). The whole system is easily scalable. The whole system (with the exception of operating level systems calls and JAVA error handling) can be localised and personalised for a local statistical office. The operating system is Mac OS X server, Solaris, HP-UX, and Windows NT. Database connectivity is almost any SQL or ODBC compatible database (Oracle, Frontbase...). Standards supported are PDF, ODBC, JDBC, RDML, XML, XSD, EDIFACT (RDRMES).

31. Reading this, one can imagine "it is perfect". But in reality there are some issues influencing the process and quality. The receiving and interpreting of the data is left to the algorithms running at the server. The inconsistencies discovered and left for solution by the operator have to be limited to the sustainable level. Systematic errors (even small ones) are often noticed too late. In SORS we have standard procedures that incorporate activities following data collection. In the stage of primary editing, the data are checked logically. In the case of electronic reporting, the responsibility for data sent is generally established during the setting up of the web or EDISENT reporting. Paper forms are signed individually. The data are electronically stored, accessible by SORS users on line. However, discussion (usually by phone) with responding units is obstructed, since they can not see what they have sent. The process requires a much greater knowledge of algorithms than before to avoid required further contacts between SORS and the responding units. A higher level of confidence must be built within the NSI and between the NSI and responding units. Revisions of the reporting process become a more important tool to monitor the reporting process.

32. The current status of the Q solution is: installation and the first half of the training has been completed, dedicated printers are in the process of being procured, pilot testing is underway. Web reporting is planned to be implemented in the second stage and is currently limited by the network security reasons (SORS is a member of the governmental network - dependent on the common governmental services).

## **VI. THE WEB SURVEY OF UPPER SECONDARY EDUCATION IN SLOVENIA (SOL-S)**

33. SORS used to send annually to all secondary education institutions a paper questionnaire with different questions on three topics:

- ?? educational institution (organisation, financing);
- ?? staff (tasks and duties, workload, educational attainment of managers, teachers and other personnel);
- ?? pupils (former education, field of education, success in present education, learning of foreign languages, place of residence, etc.).

34. As well as information provided by SORS, the Ministry of Education, Science and Sport (MESS) began demanding even more data required for policy-making. The questionnaire was comprehensive and complex due to interrelations between different tables which data providers had to fill in. Due to many mistakes that occurred during completion of the questionnaire, the editing load on SORS was heavy and in many cases automated editing was not possible. As a result, the editing process was extensive, time consuming and expensive for both data providers and SORS.

35. Web questionnaire: In 1999, a team of experts from SORS and MESS was established with the task to prepare a questionnaire to fulfil the needs of both institutions. Due to IT possibilities (all data providers are equipped with PC and have Internet access) and problems with editing, the decision was taken to make a web questionnaire with basic data checks integrated in the tables and between the tables. Filled in questionnaires were sent to the database in MESS and were used by both institutions. It was also decided that high-quality training for data providers was needed to equip them with the necessary skills to complete the questionnaire. The web application was outsourced to a private firm, so three partners were involved in the process. Around 250 reporting units can access the WEB questionnaire by entering their ID and password. The data base tool is Microsoft Access 97, programmed in ASP on Pentium II 400 MHz, 512 MB ram Windows NT 4.0. The Internet connection is that of 2 MB transfer rate on Internet provider.

36. Many lessons were learned from the process of implementation. The most important one involves setting the priorities and dividing tasks between partners. It seems that data quality issues are of a higher priority in SORS than in MESS and, because of this, the message to the contractor was less clear than desired. On the other hand, data providers found the questionnaire to be easy to fill in and data checks supportive while filling in the questionnaires. 50% of data providers had no difficulties at all in the first year of implementation, 25% had minor difficulties and only 25% described their difficulties as major ones. A final conclusion is that good preparatory work with clear objectives is crucial for the success of an operation involving multiple partners.

## **VII. POINTS FOR DISCUSSION**

37. There are opportunities and risks that derive from technological development and their effect on the statistical production process. When SORS tried to develop and implement the EDR strategies efficiently, lessons were learned and several points for discussion have been opened. Some of them are presented in the paper.

### **VII.1 Migration of research results into production environment**

38. In order to use the latest developments in the field of ICT efficiently, the top management of NSIs has to pay attention to several management, organisational and policy issues. The development of the EDR is a strategic issue. The testing has to be performed at the responding units' level while the project as a whole has to be considered as a "real one". The responding units are moving from paper questionnaires through double reporting (paper, electronic) to EDR only. The technological and organisational structure in the office and also at the responding units has to permit that transition. In order to implement EDR, emphasis should be put on:

- ?? top management commitment;
- ?? change of the organisational culture;
- ?? standardisation and integration of technological and organisational infrastructure;
- ?? better knowledge on the quality and availability of the sources for statistics;
- ?? promotion activities to potential EDR respondents;
- ?? training of the trainers and the staff concerned;
- ?? training of respondents;
- ?? pilot testing at the level of the responding units;
- ?? mixed teams (input division, statisticians, IT staff) with good knowledge of respondents;

- ?? systematic planning;
- ?? use of good practices and experiences from others;
- ?? possible "intermediators";
- ?? data respondents' benefits, including better statistical services for them.

## **VII.2 Integration of the information needs of several public administrations**

39. Slovenian statistics have been developed as register-oriented statistics, meaning intensive use of administrative records. There has been some successful integration of data collection going on for years, but there is still a lack of standards (technical and related to content) when talking of response burden caused by different public administrations. EDR made the problem more visible, when several institutions approached the responding units with different standards.

Two points should be mentioned:

- ?? Technical integration as an integrative ICT approach concerning technical standards and protocols which might be agreed between different public institutions and supported by appropriate software produced by private software publishers. There is current experience from CBS Netherlands where at the state level the Electronic services project was completed and the promotion foundation was established in order to promote that solution which will be incorporated in the commercial software;
- ?? Content integration of the data collection process which means use of the common concepts, definitions and classifications which enables common data bases.

40. Priority of work might be placed on the agreement to be reached on the ICT standards, where open standards are preferable. The project on upper secondary education in Slovenia presented in the paper shows that the respondents very much appreciate that kind of solution and that they are willing to undergo the additional training required. The biggest problems are how to reach an agreement between requests from different state administrations, to define the common standards and to share the costs. But even if the project itself has been successfully performed, the problem of maintaining the changes (content, IT developments) has to be well defined and contracted for the future.

41. The strategy of E-commerce for 2001-2004 was decided in 2001 by the Government of the Republic of Slovenia. The strategy incorporates the following elements:

- ?? metaregister as e-point for access to administrative registers and records;
- ?? register on administrative procedures;
- ?? catalogue of all public administrative registers and records.

The strategy offers the opportunity to understand, integrate and use more extensively administrative registers and records for statistical purposes and for more efficient administrative use as well.

## **VII.3 Outsourcing of the EDR**

42. SORS have been faced with a lack of ICT expertise for years. One of the possible solutions is outsourcing of the EDR. One might expect problems when doing complete or only partial outsourcing. Some of them have already been experienced in SORS and they are noted below:

- ?? integration of the solution with the overall process development;
- ?? problems of maintaining the application in the production stage;
- ?? problem of introducing the changes;
- ?? contact with the responding units;
- ?? public tendering requires the best solution which can also mean new entries, new knowledge and involvement of NSI staff.

43. It is very clear that in the case of outsourcing, the NSIs have to build their own critical knowledge base in order to cope with the outsourcing support efficiently. Small NSIs like SORS need



additional support (outsourced too) on project management of outsourcing. It must be defined in advance to follow the SORS strategy and policy in the field of outsourcing.

#### **A. International cooperation**

44. There are good practices and products produced by statistical offices (BLAISE, EDISENT) which are used in the international statistical environment. There are many benefits, but also some problems. Because the software production is not the main activity of statistical offices, the problem of maintenance and development might appear if the producing statistical office changed the priority. On the other hand, as was already mentioned, the software publishers do not see the cost benefit in producing software solutions with the statistical part incorporated. The solution would be that the statistical requests become a part of the standard software solutions, available on the market. This was one of the objectives of the TELER project that has not been fully attained. One of the reasons for this could be a lack of promotion.

#### **B. Efficient management of increasing technical complexity**

45. In order to cope with increasing technical complexity, an integrated approach to the organisation of internal production processes is necessary. Development of the conceptual, organisational and IT support for metadata management<sup>1</sup> is central to such integration. This has already been presented by Klep (1999, 2000). The conceptual framework has been followed by development of inside EDI procedures. One of the most important ones is the development of classification server (KLASJE). The experiences show us that:

- ?? more coordination between different parts of the office is needed;
- ?? all the data inputs (primary and secondary data sources, EDR or paper-based) should be handled through the one input division;
- ?? data flow of different sources should be treated in an integrated way;
- ?? the paperless editing process requires change in the attitudes of statisticians;
- ?? one stop point for communication with data respondents has to be organised with an appropriate help desk;
- ?? use of statistical algorithms and statistical techniques in the editing process will decrease the need for direct contacts with data providers. Good influence on the cost reduction, response burden as well as data quality has been expected.

46. By using BPR (business process reengineering), we can critically analyse, redesign and improve the existing processes within the SORS. It is not recommendable only to modify some partial processes, but to make a snapshot of the whole business process and to redesign it with the purpose of reducing costs, improving quality and increasing efficiency. In our case, the IT is a very important part of reengineering. We have to include modern IT in the working process to as great an extent as possible. For BPR, the support of the top management is crucial.

#### **C. Electronic questionnaires**

47. Technically speaking, SORS uses two types of questionnaires:

- ?? The automating mapping from enterprise records to statistical requests (in case of EDI-FIN). There are some preconditions for such an "EDISENT"-type approach: integration and harmonisation of statistical requirements, knowledge on the content of the enterprise records and availability of possibly standardised records on the respondents' side. TELER proved that

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<sup>1</sup> In 2000, the SORS metadata model was defined and the software application for handling with metadata CMR – (Corporate Metadata Repository) was developed in 2001 as a project in STATCOP 98, financed by PHARE. The model has been partly operational in regular statistical production.

administrative records standardisation is not really necessary, but it makes it easier to complete the tasks;

- ?? Web questionnaires have been used in the third project, as we presented in the paper, to collect data from upper secondary schools. After the training, provided to the respondents to deal with the web application, no major problems connected to questionnaires were observed. But it should be mentioned that we were dealing with a relatively small number of respondents and the content of the questionnaire was not changed a lot from paper form. Schools also have a practical interest in reporting to the Ministry because their financing depends on the data reported.

48. SORS has to explore more possibilities of using different design possibilities, these being available in a "computer" world like colours and images and testing their effect on the respondents. One thing is certain: the question wording still remains important and should be subject to testing. The size of the questionnaire is another possible obstacle prior to applying this technique of data collection more broadly. Integration over surveys and administrations (content, classifications, ICT standards) has to be an integral part of the EDR strategy.

#### **D. External and internal promotion of the new possibility for data collection**

49. ICT offers many possibilities to collect cheaper, timely and better quality data. But one might ask why there are still a lot of public institutions, including NSIs, sending paper questionnaires to respondents. Besides the topics already mentioned, more promotion activities are suggested. The promotion activities must help to remove:

- ?? obstacles within the office which might be caused by lack of management commitment message and EDR strategies to be shared with all the employees;
- ?? internal staff training in EDR possibilities, possibly on case studies and mixed teams (input staff, subject-matter statisticians, IT experts);
- ?? coordination role of NSIs in setting a content and technical standards within the public data collectors;
- ?? systematic long-term approach to respondents;
- ?? active role in presenting the problem to software publishers;
- ?? opportunities for small vs. large-sized respondents;
- ?? strategic partnerships.

### **VIII. CONCLUSION**

50. EDR could not solve the problems arising from the content and organisation of the statistical production process! Besides outsourcing, it is necessary to keep the required human resources and expertise within the office. Outsourcing is an unavoidable issue that has to become part of NSIs' long-term strategy implementation tools. As is noted in the main conclusions of the meeting on the management of statistical information technology 2001, international cooperation is needed to make an agreement on international standards and guidance for the development directions of electronic data collection. The burden of NSIs could be possibly reduced by sharing the costs in development work. The need for deeper understanding of the sources is increasing. The need for integrated management of NSIs metadata has to be handled and used as a precondition and support for EDR. The EDR development can be outsourced but implementation and maintenance have to be backed up by the critical knowledge base within the NSIs. The promotion of the new possible EDR and the overall management commitment have to be spread within the NSIs and across to the data providers.

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