

Distr.  
GENERAL

WP.11  
22 April 2010

ENGLISH ONLY

**UNITED NATIONS ECONOMIC COMMISSION  
FOR EUROPE (UNECE)  
CONFERENCE OF EUROPEAN STATISTICIANS**

**EUROPEAN COMMISSION  
STATISTICAL OFFICE OF THE EUROPEAN  
UNION (EUROSTAT)**

**ORGANISATION FOR ECONOMIC COOPERATION  
AND DEVELOPMENT (OECD)  
STATISTICS DIRECTORATE**

**Meeting on the Management of Statistical Information Systems (MSIS 2010)**  
(Daejeon, Republic of Korea, 26-29 April 2010)

Topic (i): Developing common high-level architectures

**Experience of Development of Modern Information Technologies in  
Statistical Operations in the Republic of Belarus**  
**Invited/Supporting Paper**

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1. In 2007-2011 National Statistical Committee of the Republic of Belarus (Belstat) is developing new informational system. This system will allow creating new integrated statistical informational resource by using modern software and hardware. The first step is the construction of computing networking infrastructure, including one national and six regional datacenters connected by telecommunications network.
2. The keystone element of the system is the informational-logical model of statistical information, which contains formalized description of primary and pivot statistical data, data interrelations and methods of their operation.
3. New system provides functionality of maintaining various databases as well as collection data from respondents and distribution of consolidated statistical information through Internet. Usage of electronic data signature and cryptographical algorithms guarantees integrity and authenticity of transmitted data. Enterprises and other customers will be able to satisfy their growing needs of up-to-date analytical information also using GIS technologies.
4. Finally, the new system will be essential element of e-government and will lead to confidence between citizens and government, towards more opened society.
5. Since the year 2007 the National statistical committee of the Republic of Belarus is realizing the State program of creation the Uniform information system of the state statistics of the Republic of Belarus for 2007-2011 year, approved by the Decree of the President of Belarus from November 13th, 2006 №665.
6. The basic purpose of the state statistics uniform information system - creation of the integrated statistical information resource and complexes of program, technological and technical means, which help to carry out a uniform information policy in sphere of the state statistics.

7. Accordingly to that, the State program provides a complex of actions on realization of qualitatively new approaches on atomization of processes of organizing and conducting state statistics, such as collecting, processing, generalization of primary statistical data; accumulation, storage, and protection of the statistical information; distribution of summary statistical data.

8. Realization of actions of scientific and investment maintenance provides with achievements of aims, fixed by the State program.

9. Scientific maintenance of the SSUIS provides creation of the system project of state statistics uniform information system, which includes the description of information and logical model of the statistical information, development of technology functioning of the SSUIS, development of the software of separate subsystems, carrying out of their complex debugging and maintenance of their interaction at all levels and stages of their functioning.

10. The SSUIS contains the following subsystems:

- conducting base of metadata;
- collection and processing of primary statistical data;
- accumulation and storage of the statistical information
- analysis and distribution of the statistical information;
- maintenance of information security.

11. Within 2007-2009 work, providing performance of scientific maintenance of the State program of creation of the SSUIS, on development of all subsystems according to the List of actions was conducted.

12. Further we shall stop on problems and functions of each of subsystems and stages of their development. According to the plan of realization of actions of the State program by the end of the first half-year 2010 the pre-production model of a complex of programmatically technological means of conducting base of metadata should be received.

13. Very important and following on a priority is the subsystem of collection and processing of primary statistical data.

14. The purpose of creation of a subsystem of collection and processing of primary statistical data is creation of a unified programmatically-technological complex, allowing by uniform rules to carry out processes of collection and processing of statistical data on all statistical supervision, and also providing realization of technological processes of data gathering from respondents in an electronic format.

15. For realization of the unified approach to automisation of processes of collection and data processing on all statistical supervision the subsystem provides:

- uniform universal rules of the description of forms of the state statistical supervision and uniform principles of input and editing of primary statistical data independently from kind of SSR forms;
- uniform rules of the description controls and uniform principles of construction of reports controls for all statistical supervision;
- gathering of statistical data in an electronic format from respondents.

16. Realization of the unified approach to automisation of processes of collection and processing of statistical data means presence of the uniform software for collection and data processing under all forms of the statistical reporting, adjusted on data processing under the concrete form on in advance made breadboard model which will describe these data.

17. The breadboard model represents the description of structure of SSR form, the description of its elements and communications between them, the description controls of given statistical data.
18. For drawing up the breadboard models, describing forms of SSR, components of a subsystem of collection and processing of primary statistical data « the Descriptor of breadboard models of SSR forms» and « the Description of controls» are developed.
19. Components of a subsystem of collection and processing of primary statistical data « Input from paper carriers » and « Realization of controls» are developed for realization of functions of data input from paper carriers, the control and editing of processable statistical data.
20. For maintenance of processes of gathering of statistical data from respondents in an electronic format, components of a subsystem of gathering and processing of primary statistical data “Gathering of primary statistical data in electronic format from respondents”. An AWP respondent and Gathering of primary statistical data in an electronic format from respondents. Service of processing of reports is developed.
21. In 2009 all this components were preliminary tasted. For carrying out of tests by orders of Belstat the commissions from representatives of the Customer and the Executor had been created. Tests were held in Belstat on technical means of the Customer on the real information under 18 forms of statistic reports.
22. Results of tests are reflected in reports of preliminary tests. Revealed during tests the remark and the offer are fixed in appendices to the test reports.
23. On 1–3 quarter of 2010 completion of a complex of programmatically-technological means of all components of a subsystem of gathering and processing of primary statistical data and carrying out of preliminary complex tests all subsystems is planned. Result of these works is the pre-production model of a complex of programmatically technological means of gathering and processing subsystem.
24. According to actions of the Organizational plan in September - November, 2010 tests of a complex programmatically-technological means of gathering of primary statistical data in an electronic format from respondents in a pilot zone «the Minsk area – the Republic of Belarus» with the connection of the respondents, which have agreed to participate in tests, should be held.
25. Tests will be held according to the list of forms of the state statistical reporting, approved by board Belstat (the Report of session of board from September, 23rd, 2009 №23).
26. The subsystem of accumulation and storage of the statistical information represents the unified complexes of programmatically-technological means, which allow to create and to conduct long-term statistical databases at republican and regional levels, to provide the distributed processing the statistical information.
27. In the given subsystem the ideology of realization of integrated statistics, providing opportunity of association of the information of various supervision, its usage of the subsequent analysis with the purpose of reception of the complex description of objects of supervision is incorporated.
28. The subsystem of accumulation and storage of the statistical information solves the following problems:
  - conducting long-term base of primary statistical data at republican and regional levels with maintenance of an exchange and a coordination of data (base of microdata);
  - granting of data by inquiries of a subsystem of gathering and processing for carrying out controls primary statistical data of the 2nd level;
  - processing of primary statistical data with formation of target tables;
  - formation and export of the statistical information for external users;

- formation of the aggregated parameters on the basis of primary statistical data of long-term base, their description with use of the catalogue statistical parameters and entering in a base of macrodata;
- conducting base of macrodata and generation of target tables on the basis of performance of sample of base of macrodata;
- preparation of the materials for updating information fund of databases of ready documents

29. Effective storage and usage of the integrated data for the solution of analytical problems in information system of statistics will be organized on the basis of creation of long-term storehouses of data.

30. The technology of storehouses of data will allow to unite the information of various databases and effectively to use it for the subsequent analysis.

31. For storage and distribution of ready statistical materials: tables, schedules, analytical and methodical materials the base of ready documents is used.

32. For maintenance of presentation of display and the solution of a problem of the spatial analysis representation of statistical data on a cartographical basis is realized with the use of SIS – technologies.

33. From a view of the organization of effective interaction with subjects, using information resources or participating in representation of statistical data the corporate Web-system of the state statistics is created.

34. The new version of the internet site of Belstat is intended to increase the provision of maintenance of the broad audience of users with authentic and actual official statistical information and also data on toolkit, the methodological and normatively-legal documentation, regulating the organization and conducting of statistical activity in Belarus.

35. Internet site of Belstat has the allocated zone for the authorized users and the popular part containing following sections:

- “About Belstat”;
- “Official statistics”;
- “the State statistical supervision”;
- “Selective inspection of house facilities”;
- “the Departmental reporting”;
- “the Questionnaire of the respondent”;
- “the Questionnaire of the user”;
- “Services for users”;
- “the Internet sites of territorial bodies of the state statistics”;
- “National and international statistical organizations”;
- “News”;
- “the Feedback”;
- “the Sitemap”.

36. The subsystem of maintenance of information safety represents set of computing and organizational resources, which should provide a continuity and dynamism of processes of protection of the information at all levels of the SSUIS.

37. The Subsystem of maintenance of information safety is the main and it includes:

- a subsystem of authorization and differentiation of access (PC - ADA);
- a subsystem of gathering and audit of events (PC - GAE);
- a subsystem gateway of shielding and counteraction to intrusions (PC - GSCI);
- a subsystem of the certifying centres;

- a subsystem of anti-virus protection (PC - AVP).

38. The primary goals of the Subsystem of maintenance of information safety are:

- maintenance of confidentiality, integrity, availability and authenticity of the information at its storage, processing and transfer;
- giving of a validity to the electronic documents created, saved and transferred in SSUIS according to the legislation of Belarus;
- revealing of sources of threats of safety of the information, the reasons and conditions, threats promoting realization, creation of the mechanism of operative reaction to threats of safety of the information;
- detection and deactivation of nocuous programs;
- maintenance authentication of users of the SSUIS.

39. The Basic functions of a subsystem of the certifying centres are:

- formation and maintenance of functioning departmental infrastructures of the open keys (with prospect of "integration");
- maintenance of authentication of respondents during gathering statistical data in an electronic format;
- giving a validity to the electronic documents created, saved and transferred in SSUIS.

40. In 2010 the subsystem of the certifying centres in «a pilot zone» (a republican level –department root certifying centre and also the Minsk area and the city of Minsk - the subordinated certifying centre) is functioning.

41. In the long term the further construction of the SSUIS hardware platform of the Subordinated certifying centre will be distributed on all the Main statistical managements of the regions.

42. Realization of actions of investment maintenance of the State program provides creation of the computing and network infrastructure of state statistics uniform information system of Belarus(CNI SSUIS). CNI SSUIS was developed as a hardware platform necessary for providing possibility of introduction in bodies of the state statistics of results of scientific maintenance of the State program and reception maximal efficiency from their use.

43. Works on creation CNI SSUIS include:

- construction of local computer networks (LAN) of territorial bodies of the state statistics;
- association of a LAN in a corporate telecommunication network;
- introduction of system of e-mail of bodies of the state statistics;
- creation of Data-processing centres of republican and regional levels, including construction of an engineering infrastructure necessary for their functioning;
- purchase of means of computer facilities and the peripheral computer equipment;
- introduction of corporate system of electronic document circulation of bodies of the state statistics of Belarus.

44. Creation of CNI SSUIS according to investment maintenance with the State program is carried out in three stages:

- development of the complex project of a network and computing infrastructure, creation of local computer networks of regional and regional levels,
- creation of a corporate telecommunication network, creation common system computing infrastructures at a republican level and in pilot objects (on an example of one area)
- creation of common system computing infrastructure on all objects

45. Introductions, performance of starting-up and adjustment works summing up realization of first two stages can note the following.

46. Within the limits of the second stage of investment maintenance of the State program, realization of 7 building projects on creation of an engineering infrastructure of the centres completed data processing Belstat and the Main statistical managements of areas; the actions stipulated by the contract design « Computing and network are executed infrastructure of uniform information system of the state statistics of Belarus» for the second stage.

47. Results of performance of the second stage are:

- an engineering infrastructure of 7 data-processing centres (Belstat and the Main statistical managements Brest, Vitebsk, Gomel, Grodno, Mogilyov, Minsk areas), providing conditions necessary for functioning telecommunication and computing means of the SSUIS;
- pilot zone CNI SSUIS, created on the basis of Belstat and the Main statistical management of the Minsk area (data-processing centres completed by the testing facility of subsystems, developed within the limits of scientific maintenance of the State program);
- a corporate telecommunication network, uniting in uniform information space of a LAN of bodies of the state statistics of Byelorussia.

48. Creation of a pilot zone in 2009 is duly and important action, providing formation of a necessary platform for carrying out tests and debugging of subsystems of the SSUIS, estimations of adequacy of technical decisions on construction of the computing and network infrastructure, accepted by developers.

49. Lead within the limits of the second stage of investment maintenance starting-up and adjustment works already now allow the bodies of statistics connected to a corporate network, to spend an exchange of the open information with use of post system Microsoft Exchange. In process of equipment of data-processing centres by the necessary equipment, the software and performance of corresponding starting-up and adjustment works the opportunity of transfer will be provided by means of e-mail of the information of limited distribution, works in corporate system of electronic document circulation, use of some other services accessible to the networks of data transmission constructed on the basis of report TCP/IP.

50. The structure and sequence of works in 2010 will be specified at the conclusion of corresponding State contracts. Probably, during work modification in the documentation of the techno working project is required. Thus, by the end of 2010 equipment of bodies of the state statistics by means will be completed, stipulated techno working project « the Computing and network infrastructure of Uniform information system of the state statistics of Belarus», also necessary conditions for expansion SUDB and carrying out of complex starting-up and adjustment works in 2011 will be created.

51. CNI SSUIS includes a number of subsystems. Here are the subsystem of local computer networks, a subsystem of data-processing centres (regional and republican levels), a subsystem of telecommunications concern, subsystem of monitoring and management. Each of subsystems in turn develops from a component. So, the constructed local computer networks can be divided on 2 components: LAN by itself (the cable system and the active telecommunication equipment here concerns) and a network of electronic supply of computer techniques. The subsystem of data-processing centres includes such components as the server equipment, system of a data storage, system of reserve copying and restoration of given, system of uninterrupted electronic supply of equipment CDP, climatic system, the monitoring system of access to premise CDP, fire-prevention system (system automatic fire alarm and system of removal of a smoke and gases after a fire).

52. The purpose of creation ASED is the organization of corporate electronic document circulation Belstat and territorial bodies of statistics for the organization of uniform information space, in which environment the opportunity of teamwork with all documents is given to users.

53. ASED Belstat unites uniform technology of work all the organizations connected to system on republican, sub regional and regional levels, and also provides observance of a principle «unitary input of the information and its repeated use». ASED Belstat automates not only traditional business functions, but also subject activity Belstat; and also performance analytical, reference work, uses elements of electronic document circulation with gradual transition to high-grade electronic document circulation.

54. ASED Belstat provides integration with system of protected e-mail of state bodies “Mailgov”, the uniform information monitoring system of performance of assignments of the President of Belarus.

55. ASED Belstat is created on the basis of base license ON «Electronic Business», developed by company RUP «Centre of electronic document circulation» BSU on the basis of system «Electronic BUSINESS» (Joint-Stock Company “Electronic office systems Moscow”), which represents a complex interconnected technical and the software supporting all process of document circulation in the organization.

56. Necessary condition of successful realization of the SSUIS is maintenance of system integration of all subsystems entering into it, on the basis of uniform technologies of data processing and uniform information and logical model of the statistical information, which represents the formalized description of statistical data and their interrelations, and also base procedures of a manipulation by these data.

57. Methodological base of creation of information and logical model becomes the coordinated methodology of processing of statistical data at its all stages, considering features not separate forms of the statistical reporting or even branches, and all system of statistics.

58. Difficulty of the decision certain above problems consists in the fact, that carrying out an estimation of reliability and consistency developed methodologies on the basis of their modelling has the limited opportunities, therefore for reception authentic results carrying out their testing and working off on real statistical data with maintenance of the maximal account of specificity various is required objects statistical supervision.

59. That way, the process of creation of information system represents evolutionary process with consecutive development of methodology, modernization of a subsystem of conducting metadata and information and logical model, completion of complexes of programmatically-technological means of processing of the statistical information.