The World Bank

National Strategy for the Development of Statistics of the Republic of Belarus

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ABBREVIATIONS

CAPI	Computer assisted personal interviewing	NBB	National Bank of Belarus
CATI	Computer assisted team interviewing	NGO's	Non-governmental organizations
CIS	Community of Independent States	NSDS	National Strategy for the Development of Official Statistics
CODED	Concepts and Definitions Database	NSS	National Statistical System
CPI	Consumer Price Index	PPP	Purchasing Power Parity
DBMS	Database management software	RIS	Research Institute of Statistics
EDI	Electronic Data Interchange	SAD	Separate Administrative Document
GIS	Geographic Information Systems	SBIR	Union of Belarus and Russia
GPS	Global Positioning System	SDMX	DataStream management
ICT	Information and Communication Technologies	SME	Small and Medium Enterprises
IIP	Index of Industrial Production	SNA	System of National Accounts
ISIC	International Standard Industrial Classification	TQM	Total Quality Management of statistical processes
ISIS	Integrated Statistical Information System	UN FPOS	United Nations Fundamental Principles of Official Statistics
MPS	Material Production System of national accounts	UNSC	United Nations Statistical Commission
NACE	Statistical classification of economic activities in the European Community	VAT	Value Added Tax

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1. Foreword

National Statistical System (NSS) is one of the fundamental, infrastructural information systems determining the development of democratic, modern state, of information society and market – driven, knowledge - based economy in **the Republic of Belarus**.

The National Strategy for the Development of Official Statistics (NSDS) of the Republic of Belarus is the dynamic framework program of long term development of state statistics, determining the approaches, methods, tools and strategic actions necessary for harmonized and effective information infrastructure of the country and economy. The NSDS contains following components:

- the **target model** of the national system of official statistical (NSS) of the country and methods of its dynamic updating,
- the **roadmap** of driving the NSS from the existing statistical system to the directions determined by the target model,
- the **methods and approaches** of anticipating adjustment of the NSS to social, political, economic and technological changes of the country, taking into account its position in globalized, more opened, market - driven economy,
- the **ways of coherent development** of the NSS as an integral part of the information infrastructure of the state, national economy and society,
- the approaches and practical actions of **implementing international standards** providing the coherence of the NSS with global statistical system and with national information infrastructure of the country,
- the approaches to the **optimization of the resources** for official statistical activities by all stakeholders of statistical processes, i.e. respondents, other sources of information, statistical offices and all groups of users,
- **statistical resources** (staff, finances, material infrastructure, ICT), i.e. all kinds of resources needed for the realization of the framework program,
- **strategic actions** necessary for effective implementing of the program of development of official statistics,
- effective implementing and use of **modern ICT** for optimizing statistical production processes.

The priorities of implementing the NSDS for the Republic of Belarus shall cover the following areas of national statistics and its legal, organizational and technological environment:

Laws and institutions

- Harmonization of statistical laws with the laws regulating the administrative information systems of the country, with special reference to the program of developing *Electronic Belarus*

- Organization of centralized statistics, regional structure of centralized statistics, organization of statistical services of ministries and regional authorities,
- Coordination of official statistics by the Intergovernmental Statistical Council and by the Minister of Statistics and Analyses,
- System of documentation and data flows in the NSS.

Methodological foundations and tools

- Statistical registers and statistical frames:
    - Statistical business register
    - Strengthening statistical frames, with special reference to social and agricultural statistics
- Implementation of international methodological standards and their adoption to national needs, with special reference to NACE Rev. 3 (ISIC) and CPC.
- Implementing the requirements of the SNA on the level of branch statistics (managed by ministries) and regional statistics.
- Optimizing the surveys and minimizing the burdens of respondents and expenditures of governments for statistical activities, i.a. replacing full surveys by sample surveys, especially in economic statistics covering the SME (small and medium enterprises).
- Methodological adjustment of administrative records and statistical methodologies to the driving of statistical primary data from administrative information systems.

Infrastructure

- Optimization of organization of centralized statistics (central and regional statistical offices on oblast and rayon levels).
- Organizational integration of decentralized statistics (statistical services and systems of ministries, the National Bank of Belarus, regional governments) with centralized statistics into one integrated NSS.
- Optimizing the structures of regional and local statistical offices and their functions in modern ICT environment.
- Technical infrastructure of statistical offices (modernization of equipment of offices and workstations of statisticians).

ICT

- Place, role and functions of official statistics in the program of building the information society in Belarus - ***Electronic Belarus***.
- Development of statistical ICT infrastructure of the centralized and sector – oriented (ministries, branches) statistical services
    - upgrading the ICT infrastructure of official statistics (hardware, software, telecommunication, orgware),

    - statistical intranet as the ICT tool covering and integrating all statistical services of the country,
    - statistical internet as the tool of social and economic data, metadata and paradata interchange, collection and dissemination within the frames of the system of official statistics, between administrative information systems of the country and official statistics as well as the interchange of information between the NSS and external statistical systems of UN and other international statistical services and systems.
- Modernization of methods of statistical data collection, with special reference to the methodology of questionnaires design (*electronic intelligent questionnaires*).
- Statistical portal for data collection via internet.
- Common integrated metadata and paradata bases for the whole official statistics (central and branch statistics).
- Implementing statistical database system: central data bases, branch and problem - oriented data bases, regional database systems, as tools of storage, integration and dissemination of statistical information.
- Statistical portal for data dissemination via internet.
- Dissemination of public statistical data using other forms of electronic dissemination of information (e.g. publications on CD, profiled and personalized information services), modernization of publishing policy of statistics.
- Active information services of official statistics (providing data and metadata, statistical analyzes) and personalization of data provided by statistical offices to individual users.
- Implementation of standard formats for electronic data interchange (GESMES, SDMX standards, XML).
- Implementing the DBMS and data warehousing technology for processing and maintenance of statistical data (statistical database system covering respective data from central and branch statistics)
- ICT – "saturated" workstation of a statistician (*raboshee mesto statistika*).
- Implementing computer assisted interviewing (CAPI, CATI, Internet interviewing)

Research and education

- Formation of intellectual capital of official statistics: education and training of statistical staff, development of knowledge resources of statistical offices and services.
- Research works of statistics (research units or institutes) as the basis of development and adoption of the achievements of world statistics and best practices to the needs and specificities of national statistics
- Education of stakeholders of statistical surveys: all important classes of respondents and users (businesses, governments, science, education, households, mass media).
- Statistical education of society (statistical education of the public via mass media and public education system).
- Dissemination of statistical knowledge as the public good for the society.

- Popularization of the NSDS among all stakeholders of statistical processes: governments, organization of businesses, NGOs, and researchers and academia.
- Institutionalization the NSDS by the introduction of relevant elements of the NSDS into the laws and regulations in official documents of governments.

The objective of this report is to present the proposal of the roadmap of the stepwise transformation of the national system of official statistics of Belarus from the existing *state of the art* to the directions traced out by international statistical standards and best practices.

2. National system of official statistics of the Republic of Belarus – the NSS in the process of transition – the ISIS in the process of construction

2.1. Development of the national statistical system (NSS) – historical perspective

In historical perspective, the development of the system of official statistics of the Republic of Belarus after 1945 could be divided into two major stages:

- up to 27th August 1991 - the development of Belarus statistics as the integral part of the statistical system of the USSR,
- after 27th August 1991 – the development of the national statistical system of the Republic of Belarus as the national segment of the global system of official statistics.

Before the declaration of independence of 27th August 1991, the system of official statistics of the Belarus Soviet Socialist Republic was – to large extent – one of many regional subsystems of the centralized system of official statistics of the USSR. The consequence of this fact was, that methodological works, elaboration of statistical standards, formulation of programs of surveys, compiling of statistical macrodata on the level of national economy, programs of publications and research works, were centrally managed by the Statistical Committee of the USSR and – with some minor exceptions – realized by central units of statistical services of the Soviet Union.

Statistical services in Belarus SSR, as well as in all other republics of the USSR, were dependent on methodological, analytical, programming potential of the Statistical Committee of the USSR, concentrated – as a rule - in the headquarter of *Goskomstat* based in Moscow. Some branch statistics did not exist on republican level of the at all. On republican level the dominating duties of statistical offices were mainly: identification of statistical units, dissemination of statistical questionnaires, primary data capturing and editing, production of data for regional and republican authorities, adjusted and limited to the information needs of the soviet system of centrally planned economy, supplying of regional aggregates to central statistical office (*Goskomstat*) of the USSR.

Additional problem for official statistics of Belarus was the official language. Basic language of official statistics in Belarus was Russian, also for communication with respondents. All statistical works, including questionnaires, were conducted in Russian, not in Belarus language. The question of the relation between Belarus language as the official national language, and Russian as second official language used in Belarus, will be an important issue for the future. The decision concerning the official language of representation of statistical metadata, official statistical terminologies and interpretation of input and output data (one language of bi-lingual model of official statistics) and the relations between Belarus and Russian languages will be one of the questions to be decided in the future.

After 27th August 1991, after reaching political independence and establishing the Republic of Belarus, the priority for official statisticians was to transform the existing statistical subsystem of the former Belarus SSR into the national system of official statistics of the country. That was very deep transformation of the whole system of official statistics and related information systems, which was realized by Belarus statisticians quickly and efficiently. It should be stressed that so successful and effective transformation and creation of national statistical

system in the Republic of Belarus was possible because it was based on solid foundations of the infrastructure of state statistics created in the period of the Belarus SSR, i.a.:

- high administrative status of official statistics and statistical offices as the part of government administration of the country and the main source of social and economic data for all ministries and other governments, developed for the needs of centrally planned economy,
- wide use of statistical metadata (classifications, nomenclatures, concepts and definitions) for administrative purposes by governments and other units of national economy that was also the consequence of the previous economic system,
- well - organized structures of statistical offices covering all levels and layers of the administration of the republic, from central government down to the level of local administrative units (rayon),
- educated, competent, strongly committed and experienced statistical staff,
- relatively high technological level of statistical offices, comparing with other branches of the national economy and governments, including the management of the network of computing centers providing ICT services for statistics and for other governments,
- centralized, efficient management of the processes of statistical production and dissemination.

However, as it was mentioned above, the statistical system of the Belarus SSR did not cover all areas of statistical surveys of the entire national economy and country. Some surveys and statistical capacities for developing methods and conducting those surveys and analyses had existed on the federal level of the USSR only, while on the republican level, the statistical knowledge and research capacities necessary for developing and modernizing methods and standards, did not exist or were underdeveloped.

Other specific negative features of the system of official statistics inherited from the Soviet Union were:

- underdevelopment of statistics for the use of businesses, local governments, researchers and society, governments were considered as the privileged users of official statistics, entitled to access not only the output macrodata, but also of some classes of microdata,
- underdevelopment of social statistics,
- MPS[1] – driven macroeconomic statistics: statistical and administrative information standards embedded in the categories of the MPS (definitions of concepts, classifications, input and output data),
- treating official statistics as the integral part of administrative information system of central, regional and local governments, with respective consequences of that approach for defining statistical concepts, for statistical methodology, data comparability and coherence, data quality, statistical confidentiality, interpretation of output indicators.

Therefore in the Republic of Belarus it was necessary to build the national statistical capacity for many important spheres and branches of statistical activity practically from scratch, e.g.:

[1] MPS – Material Production System of national accounts.

- statistics in the areas for which statistics was developed and compiled on federal level of the USSR only (e.g. foreign trade, railroad and air transport, banking and monetary statistics),
- national statistical potential of methodologists and analysts, especially in those areas of statistics, which in the past have not developed on republican level,
- creation of the national research and development base of official statistics.

The process of establishing legal foundations and organizational structures of the national official statistics that has been started immediately after reaching the political independence and creation of the Republic of Belarus was finalized in 1994. In this year, on the basis of the Constitution of the Republic of Belarus, the Law on State Statistics (of 27th November 1994) has established new legal and organizational frameworks of the national system of official statistics of the country.

After implementing of the Law of State Statistics mentioned above into practice, the development of Belarus statistics was focused on the adjustment of the statistical system to dynamic changes of social, economic and governmental institutions following and anticipating the transformations of the system of national economy, the adjustment of the NSS to the changes of information needs of all stakeholders of statistics. Parallely, the adjustment of the NSS to international standards and the implementation of modern ICT was going on. The amendment to the Law on State Statistics introduced in 1997 has created legal frameworks for implementing international standards in the national system of statistics and integration of the NSS with global statistical system (e.g. joining the SDDS).

Last important modification of legal framework of official statistics was introduced by the ***Law*** *on State Statistics* of 28th November 2004. The Law of 2004 is determining new organization and division of competences within the national statistical services, establishing the coordinating position of the Intergovernmental Council of State Statistics and defining leading role of the Minister of Statistics and Analyses as the central governmental organ of all official statistics in the country. The regulations of the *Law on State Statistics* of 2004 are fully coherent with the UN ECE Resolution on *Fundamental Principles of Official Statistics*, ISI *Code of Statistical Ethics*, as well as with other recommendations of international statistical institutions, which are relevant to the law of that level. They take also into account legal impacts of modern ICT, enabling wide and well controlled use of modern information technologies in statistical processes (e.g. collection, processing, storage and dissemination of data and metadata using electronic media and communication technologies).

Special attention in this Law was paid to the quality of statistical data in all phases of statistical production (responsibility of respondents and statisticians), and the measures and tools of quality control, including the amenability to law in extreme cases of infringement of the rules of statistical quality (e.g. obeying mandatory methodological and conceptual standards, requirements and criteria of accuracy, timeliness, rules of participation of stakeholders in official surveys, statistical confidentiality rules, principles of dissemination and access to data and metadata).

From 1991, i.e. from the very beginning of the establishing the institutions and structures of the national state statistics of Belarus, official statistical services of the country are taking active part in all the activities of international statistical institutions, both under the auspices of the United Nations and of other related international global and regional statistical organizations. This cooperation is important for the process of successful implementing of international standards and methods as well as for practical adoption of principles and best practices.

Nowadays, after more then a decade and a half from the day of the start of the process of transformation of national economy and national statistics, the Republic of Belarus has developed solid legal, organizational, methodological and intellectual foundations and infrastructure of the NSS, coherent in main lines with international standards and principles. They seem to be firm basis for further development of the information infrastructure of the country and effective absorption of best statistical practices, standards and modern information technologies.

Existing methodological, organizational and technological gaps between Belarus statistical practice and best practices of the world statistics are mainly:

- the results of specific role of statistical services in Belarus planned market driven economy,
- the consequences of specific functions of the system of official statistics and their relations with central and local governments,
- and – to the largest extent – the shortage of resources for statistics of the country on its recent level of economic development of the country.

The system of national economy in Belarus is still in the phase of highly dynamic changes on its way to more market - driven economy, but with active role of the central government in the process of transition and in the realization of social goals of the country.

Belarus economy is an open economy, linked with other national economies, mainly with Russian Federation (within the SBIR - *Union of Belarus and Russia*),with the countries – members of the CIS (Community of Independent States), and with other countries by cooperating on European and global markets.

Belarus economy is tightly interlinked with foreign markets. Economic processes in global economy, and even economic decisions of foreign very large global companies, may have strong impact on some branches of the national economy of Belarus in relatively short time. Those economic impulses coming from abroad may cause economic shocks for some branches as well as for Belarus economy as a whole. Official statistics of Belarus should be able and ready to react dynamically on the changes of the economy and to deliver to the governments, businesses, science and citizens the complete, relevant, reliable and timely information supporting the decision processes of users, with special reference to governments (the consequence of economic model of the country – *planned market - driven economy).*

The mentioned above internal and external factors of social and economic development of Belarus should be taken into account as the prerequisites in the formulation of the NSDS and in the proposing of practical measures and steps of further transformation and development of official statistics. Formulating the national strategy for the development of statistics (NSDS) it should also taken into account the necessity of high adaptability of the system of statistics to the changes of its social, economic, technological and political environment, much higher then in developed, stabilized, market - driven economies. The adaptability and interoperability of the information system of official statistics should be coherent with the dynamics of the model of national economy, with the dynamics of changes of social and political models, as well as with development of new information needs of all stakeholders of statistical system.

The Government of the Republic of Belarus has adopted and is realizing ambitious program of development of information society and *e-government – Electronic Belarus*. Official statistics as one of basic, national public information systems shall find its proper place in the information infrastructure of both *e-society* and *e-government*. The NSDS should define the

place, duties and role of official statistics in e-government, and in the process of development of information society in Belarus.

2.2. Dimensions of transition of the national system of official statistics of the Republic of Belarus

As it was mentioned above, the day of 27th August 1991 marks the turning point in the development of official statistics in Belarus. The *Day of Independence* was the starting day of the transformation of entire national system of official statistics.

The process of building national statistical capacity and the transformation of official statistical system of the Republic of Belarus is progressing in many dimensions. The NSDS for the Republic of Belarus should itemize the strategies, methods and tools of the development of the NSS in all main dimensions, namely:

1. **Institutional dimension** – legal and organizational frameworks of official statistics adjusted to the changes of the functions of governments, regulations of businesses and other institutions, strengthening institutional capacities of the NSS.
2. **Economic dimension** – from the statistical system incorporated into the administrative information systems supporting the model of centrally-planned economy to the statistical system of the national economy specific to Belarus in its recent process of transition: from *centrally - planned economy* to *planned market – driven economy* (*planovo – rynotshnaya ekonomika*) with stepwise growing share and role of market processes and decreasing role of administrative regulations of the economy.
3. **Social dimension** – from ***state*** statistics focused on the information support of the governmental organizations providing social services, controlled by the state or directly realized by governments, into ***national*** statistical system providing information to the society and playing the function of important segment of social information security network.
4. **Methodological dimension** – from statistical system based on the MPS standards supporting centrally – planned economy, on administrative information standards of governments and state owned enterprises, to the system coherent with global statistical methodological standards.
5. **Technological dimension** – from "*paper – driven*" data collection from "reporting units", from processing and dissemination of data in the form of paper publications to integrated statistical information system working in modern ICT environment, with wide use of computerized administrative records as the sources of primary data for statistical compilations, from archiving of statistical input and output data on paper, to the storage in modern data warehouses, from processing of statistical data by compilation of tables to the continuous, interactive and interoperable access and dissemination of data integrated with metadata using modern database technologies, and dissemination of data and metadata via ICT networks.
6. **International dimension** – strengthening the integration of the NSS of the Republic of Belarus with the global system of official statistics and tight cooperation with international statistical organizations and services.

Ad 1. **Institutional dimension**

The transformation of the Belarus system of official statistics in **institutional dimension** was finalized in 1994 by the *Constitution of the Republic of Belarus* and by the *Law on State Statistics of 28th November 1994* (No. 354-3), which has established legal basis of national system of official statistics. On the basis of this *Law* it was established the **Ministry of Statistics and Analyses** as the organ of central government. This Law has also established legal frameworks of the centralized model of official statistics.

In 2004 next important step was done in the development and modernization of institutional frameworks of official statistics. New *Law on State Statistics* of 28th November 2004 introduced decentralized model of state statistics with adequate strengthening of the methodological and coordinating role of the Minister of Statistics and Analysis and leading role of the Ministry in research and development and standardization of official statistics as a whole. The Law has also defined the competences of other ministries and governments in the field of conducting surveys and producing official statistical data.

Legal frameworks of official statistics introduced by the Law of 28th November 2004 are taken as the basis for the NSDS. It is assumed that the model of the national statistical system introduced by the Law will be the institutional basis for development of the NSS in the middle term perspective.

Ad 2. **Economic dimension**

The transformation of official statistics in **economic dimension** is a continuous process of adoption of the scope of information, statistical indicators and methods, sources of information, from the Soviet model of centrally planned economy to the specific model of national economy of Belarus, *planned market – driven economy (planovo – rynotshnaya ekonomika)*.

The model of the national economy of Belarus is dynamically evolving to more opened market economy in a number of branches, and to the adoption of specific, more market - driven economic and administrative tools of institutional interventionism of government (economic regulators and parameters instead of direct quantitative administrative decisions). The task of official statistics is to provide governments and businesses with relevant statistical information necessary for the elaboration of proper economic regulating parameters in the processes of institutional interventionism, administrative decision making and control of their realization by lower level governments and state owned businesses.

High dynamics of the changes of Belarus economy requires adequately high elasticity and adaptability of the system of official statistics to the changes of respective scope of surveys and statistical production processes necessary for the following the changes of the requirements of users of statistics, and adoption of methods and techniques of participation of other stakeholders in statistical processes (respondents, intermediaries, governments supporting statistical production, media). High dynamics of economic processes requires also additional substantial efforts from the part of official statisticians to be adaptable and interoperable with administrative information systems. Important economic phenomena and processes in the country, regions and branches, have to be monitored by statistics using different, specific methodological approaches, duplicating – if necessary - statistical observations, output data or metadata (e.g. KOHX and NACE) for enlightening those phenomena and processes from dif-

ferent perspectives (e.g. employment and unemployment statistics based on [1] administrative registers, [2] business statistics and [3] household surveys). This specificity of the Belarus economy in transition requires additional resources for official statistics (expertise, methodological and analytical staff and the ICT), necessary for elaboration of new statistical methods, new or re-designed surveys, new metadata, new output products as well as resources for reaching higher adaptability of statistical production processes to dynamic changes of information environment of official statistics (new information needs, new data sources, ICT, new statistical standards) and interoperability with the dynamically changing administrative information systems of governments and other organizations.

Official statistics has to be adjusted – on one hand - to the statistical monitoring of dynamic changes *developed* for market driven economy integrated with global markets and national economies of other countries, especially the economy of Russian Federation and other CIS countries, and – on the other hand – to support planning and control functions of central and local governments and decision making processes in the state sector of national economy (state-owned enterprises and budget sphere of the economy).

Ad 3. **Social dimension**

The transformation in **social dimension** requires deep changes of the scope of collected and produced information, development of methodological approaches enabling the analysis of social processes in transition and re-organization of statistical processes in all fields of social statistics. It requires the re-design and extending of existing social surveys and implementing new social surveys.

Significant progresses have been already achieved by the Belarus official statistics in developing and adjusting social statistics to the statistical monitoring of social processes. These progresses are using and adopting best practices of leading statistical offices and countries. However the observation and analyses of new social and economic phenomena and new information needs of main users require further developments and upgrading of social surveys[2].

Ad 4. **Methodological dimension**

The transformation in **methodological dimension** is focused on the adjustment of the national system of official statistics to international statistical standards, i.a.:

- *Fundamental Principles of Official Statistics* recommended by United Nations Statistical Commission, the UN Economic Commission for Europe and other international statistical institutions programs of surveys,
- Standard concepts and definitions, classifications and nomenclatures,
- Standard methodologies of statistical surveys, cooperation with respondents, users and governments,
- Optimization of statistical processes by wider implementation of sample surveys based on strong frames and the use administrative records for statistical purposes.

[2] See Olenski J., *The framework of standards in social statistics with special reference to transition countries in the ECE region, - non-candidates to the European Union*, UN Statistical Office, Proceedings of the International Seminar on Social Statistics, New York, 2003.

In the period of over 15 years of transition of Belarus social and economic system, the process of methodological transformation of Belarus official statistics, its coherence with international standards and interoperability with international statistical systems is rather advanced. It seems that main milestones marking the adoption of Belarus statistics to international standards (classifications and nomenclatures, NSA driven national accounts, methodology of statistics of international interest, e.g. SDDS indicators, foreign trade) have been already passed over. However, because of the specificity of the model of Belarus economy, in some areas of statistics the data should be produced parallel in "old" and "new" methodology, meeting "old" and "new" information needs of users, collecting data drom "old" and "new" information source, using "old" and "new" statistical technologies.

The process of methodological transformation and full adoption of international standards without excessive losses of usefulness of statistical information for national users is one of priorities of official statistics. Additional efforts from the part of statisticians, and additional resources for national statistical system are needed.

Ad 5. **Technological dimension**

The transformation in **technological dimension** is the consequence of development and implementation of modern ICT in global economy, in national economy of Belarus, in governments, businesses and households. The coherence of national official statistics of Belarus with international statistical system, its technological interoperability with international statistical organizations and institutions, as well as the interoperability with respondents and users, need respective upgrading of ICT of official statistics.

The system of official statistics of Belarus, because of shortage of resources and high costs of upgrading the ICT infrastructure, has not reached the technological level necessary for coherence and interoperability both with other administrative systems as and with international organizations. The ICT dimension of transformation needs strong external support from the part of government budget as well as from the part of international organizations.

The qualitative upgrading of the ICT infrastructure of Belarus official statistics is the prerequisite of practical implementing of new methodologies and surveys, as well as the prerequisite of the optimization of costs and resources needed for statistical production processes and dissemination of information.

Ad 6. **International dimension**

The transformation in the international dimension consists in the following:

(a) implementing international statistical standards on national level in all areas of statistics, in which it is possible, having in mind the national specificity of the phenomena and processes described by statistical concepts and data,

(b) creative adoption of international standards to the specificity of national or regional conditions and users requirements, providing the coherence of national statistical data and metadata[3],

(c) interchange of statistical data and metadata between national statistical system and other international or national statistical systems,

[3] E.g. passive "transplantation" of translated international classifications may lead to the misinterpretation of data and to the difficulties in precise describing of specific phenomena

(d) cooperation of national statistical services with international statistical organizations, active participation in international statistical projects, bilateral cooperation and exchange of experiences and practices with other national statistical services.

2.3. NSS of Belarus – the state of the art

The analysis of the state of the art of the NSS of Belarus was elaborated in the excellent expertise of the Word Bank consultant Mr. Alex Korns: *Statistics in Belarus: Assessment, February 2007* [4]. The analysis is based on his mission to Belarus during 20 March to 12 April, 2006.Full detailed description of the system of state statistics in Belarus is presented in the great work of Victor Tamashevich and Victor Elsukov, State *of the art, functional activities and problems of development of the state statistics of the Republic of Belarus*[5].

The mentioned above expertize of Mr. Alex Korns is complementary to this document. To avoid the duplication of information, we would like to pay the attention on main findings and conclusions that can driven from expertizes of Korns, as well as from the deed of Prof. V. Tamashevich and Dr. V. Elsukov.

1) The official NSS is adjusted to the requirelemnt of economic system of the Republic of Belaurs, i.e. to the *planned, makret – driven economy (planovo – rynotshnaya ekonomika)*.
2) The laws, organization and methodology of official statistical surveys referring to the privat sector of the economy are fully coherent with international stadards and recommendations. However for the state sector of the economy the NSS fulfills not only the function of the source of statistial data, but also plays the role of an administrative information system supporting central and local governments.
3) The organization infrastructure of statistical offices is coherent with the organization of government administration of the country, typical for the economic model of the centrally planned economy. The changes of social and economic system of the country and methodological, functional and organizational changes of the NSS shall enable to introduce respective optimization of statistical processes of both centralized and decentralized statistics, reducing the redundancy of data, the burdens of respondents, optimizing the capacities used for input data capturing and editing on local and regional level, strenghening methodological and analyical capacities on regional and central levels.
4) Belarus statistics has been implemented basic methodological standards recommended by international statistical institutions. I.a. following the recommendations of the IMF, Belarus' statistics has successfully joint the SDDS and is regularily supplying requested data.
5) However there are important, difficult tasks unfulfilled up to now, that are of strategic importance for the integrity of Belarus statistics with international statistics and for its adjustment to the needs of market – driven economy. Those tasks need the inter-branch, inter-departamental and inter – ministerial coordination of different surveys by the man-

[4] Korns A.: *Statistics in Belarus: Assessment*, World Bank consultant report based on a mission to Belarus during 20 March to 12 April, 2006), Bogor, Indonesia, February 2007
[5] Tamashevich V., Elsukov V., *State of the art, functional activities and problems of development of the state statistics of the Republic of Belarus*, The World Bank, Minsk 2006 (in Russian)

agement of the Minstat. The role of the department of Minstat responsible for methodological coordination of surveys can hardy be overrated. The tasks of high priority in that field are following:

a. Introduction of the recent revision of the ISIC - NACE (OKED) into statistical practice.
b. Introduction of the international standard commodity classification (OKP) consistent with OKED into statistical practice.
c. Establishment of a system of information resources: statistical metadata system and the system of statistical databases.
d. Elaboration or updating full correspondence tables between up-to-dated versions of other international classifications in economic and social statistics.
e. Establishment of a system for on-line information exchange of statistical business register with the uniform state register of legal entities and individual entrepreneurs.

6) A few tasks did contribute in a coherent way to improvements in the national accounts estimates:

- The national accounts department developed supply-and-use tables for goods and services in line with international recommendations.
- The department for industrial statistics implemented an improved method for calculating the index of industrial production, discussed later in this report. The improved method had been recommended by an IMF mission and was implemented (as part of the workplan) in 2002 but was not published until 2006.
- A method for conducting a sample survey of those retail vendors not in the statistical register, in order to improve coverage of retail sales. This method, implemented in 2006, is designed to provide data on an important branch of the hitherto non-observed (non registered or shadow) economy[6].

7) The model of the NSS of Belarus is composed of two layers: the layer of centralized statistics (Minstat, regional and local statistical offices) and decentralized statistics (statistical works of ministries and the National Bank of Belarus)[7]. The coordination of the surveys conducted by the statistical services of ministeries and other governments by the Minstat is limited – as a rule – to the passive registration of the surveys proposed by the ministries in the joint program of surveys.

8) From the institutional and legal points of view the mechanisms of coordination of statistical works of the NSS are strong and efficient. The central coordinating body is the *Interagency Council on the State Statistic*s, established in compliance with the Resolution of the Council of Ministers № 647 of 16 May, 2003, coordinates statistical activities of the relevant agencies. The Deputy Prime-Minister is the Chairman of the Council. The Vice-Chairman is the Minister of Statistics and Analysis. Representatives of the National Bank, Ministry of Economy, the National Academy of Science of Belarus, Ministry of Justice, Ministry of Industry, Ministry of Finance and Ministry of Agriculture and Food are members of the Council. The composition of the Council (high level representatives of ministries, of the Central Bank, the Academy of Science and of other institutions) allows it to take direct account of user requirements to some extent, but it is not very broadly based in terms of membership compared with models in some countries. Due to its membership, it

[6] Korns A., op.cit., p. 14.
[7] Ibidem, chapter 2.2.2., p.11 – 14

functions as an advisory body rather than an executive decision making body. The reports of the Council are publicly available documents (See ROSC Report 2005).[8]

9) The quality of statistics from the point of view of its coherence with international standards in basic subject matter areas is good. However the opinions of users show limited level of confidence to statistics. E.g. The ROSC conducted a small a small survey of data users. Many users expressed the following concerns, that:

   - national accounts may be distorted by overstatements in the data provided by enterprises, due to political pressure on them to meet targets. Only 40 percent of users consider national accounts to be unbiased and accurate.
   - official statistics are not fully in line with international standards and seem to be manipulated for political purposes.
   - frequent revisions are an indicator of unreliability. These views appear to reflect some misunderstandings by users, for example, in regard to the function of revisions.
   - metadata for national accounts and price statistics is difficult to access[9].

10) Like other agencies in the Government of Belarus, the Minstat does not yet engage in program budgeting. However, the Ministry of Finance is in the process of moving to program budgeting, and the Minstat has begun to think about it as well. Under the existing system, the Minstat does not have a clear picture of the cost to the Government of specific surveys and compulsory reporting forms (not to mention the cost to respondents).

11) The ICT infrastructure of centralized statistics covers all statistical offices, enabling data capturing, editing and interchange from rayons to oblast and from oblast to the Minstat. However the technological level of ICT is rather obsolete, (in other words, of an older "vintage") at both the Minstat headquarters and in the oblasts and rayons; furthermore, the rate of annual purchases is so low that obsolescence is unlikely to end soon without a major increase in spending for new computers.

12) Statistical data processing systems are very "traditional" (processing and compiling statistical tables from statistical paper questionnaires), although the available database software and technology enables to develop statistical database systems for compiling statistical aggregates and for their storage and dissemination. Therefore the development of the system of statistical data bases seems to be one of priorities of implementing modern ICT in the NSS.

13) The number and quality of staff working in Minstat and regional offices seems to meet recent needs of the NSS. However having in mind new tasks and the needs of continuous development of statistical methodology, technology and dissemination, the following observations could be made:

   - Salary levels are attractive for existing staff and appear to be competitive with alternative opportunities, as is indicated by low staff turnover. The Minstat does not seem to have major difficulty keeping highly qualified specialists, except for those in IT.
   - There is a marked aging at the Minstat, with the share of staff age 50 and over rising from 14.1 to 26.3 percent from 1995 to 2004. At the same time, the share of

[8] ROSC – Data Module Response by the Authorities, IMF Country Report No. 05/29, February 2005, p.5.
[9] Ibidem, p. 17

younger staff has also increased somewhat, from 10.2 to 13.7 percent. The Minstat has difficulty hiring the most talented young people, for example high-ranking graduates in economics, because prospective salaries are low compared to alternatives.

- The Minstat does have some difficulty in hiring highly qualified programmers, due to better remuneration elsewhere.
- Financial constraints do not allow the Minstat to organize systematic and regular classes for staff education or provide training at the Ministry to regional staff. Lack of English skills hinders the study of statistical methodology.
- There is the shortage of high level methodologists, analysts, researchers and IT experts. The existing staff is representing high professional level and strong motivation, but the number of this staff is not sufficient for realization of the tasks of modernization of statistical surveys and analyses.

14) The Minstat has elaborated comprehensive Program of Development of State Statistics of the Republic of Belarus for 2006 – 2010. The Program was introduced by the decree of 1st July 2006 No. 139-1 of the Minister of Statistics and Analyses. This document should be considered as the framework of the NSDS. The Program is itemizing all main tasks of state statistics both centralized and decentralized statistics in the following areas:

- Statistical standards and complete program of implementation of international standards in the NSS,
- Statistical methodology, development of methodologies for specific areas of statistics,
- Methods, tools and techniques for improving statistical production and increasing its efficiency, reducing costs for all stakeholders of statistical processes
- Development of integrated statistical information system and statistical registers
- Strengthening the capacity of official statistics: staff, organizational and ICT infrastructure
- Resources necessary for the realization of the Program,
- Mechanism of the realization of the Program and the action plan.

The general conclusion driven from the analyses elaborated by the UN, IMF and World Bank experts is that the Minstat is still in a period of transition between its older functions in support of a planned economy, under the Soviet system, and its newer functions in the context of a market economy. The older functions relied heavily on compulsory reporting, which is still the predominant means of data collection at the Minstat.

The newer functions require that the Minstat devote more attention to national accounts, social indicators, and international trade, as well as to sampling, statistical infrastructure, and other methodology functions, and to economic analysis. The newer functions will also require that the Minstat take better account of the cost of data collection both to the State and to respondents and strive for ways to minimize those costs. The newer functions require that the Minstat devote more attention to national accounts, social indicators, and international trade, as well as to sampling, statistical infrastructure, and other methodology functions, and to economic analysis.

The current situation also requires that the Minstat develop management methods for coordinating statistical innovation across its own departments, sometimes even with outside agencies.

The current situation also requires that the Minstat develop management methods for coordinating statistical innovation across its own departments, sometimes even with outside agencies. In the 15 years since independence, the Minstat has made great forward strides in implementing the new systems required by a market economy and by national sovereignty. Despite many steps forward, the Minstat still needs to invest more in new tasks and functions and less in older, inherited functions.

2.3. The institutional model of the system of official statistics in Belarus

The 2004 Law has introduced the model of state statistics that is called *a centrally coordinated decentralized model*. This model is common in many European countries. It is observed the trend to the decentralization of statistical services between the central statistical agencies and statistical divisions or sections of other central and regional governments. This model has been chosen for Belarus.

The advantage of the decentralized model is closer involvement of institutional users (ministries) in statistical production process. On the other hand however the of the coordination, avoiding duplication of flows, control methodological integrity and quality of data produced within the national statistical system are more complicated**.**

The following agencies are responsible for production of official statistical data in the Republic of Belarus[10]:

- **The National Bank** of the Republic of Belarus (NBRB) is responsible for the preparation of the balance of payments and banking and monetary statistics.
- **The Ministry of Finance** provides budget data to the Minstat, on the basis of an agreed schedule.
- **The Ministry of Agriculture and Food** collects decentralized statistics on activity in agriculture and agro-food industry, although the main production statistics are collected by the Minstat.
- **The Ministry of Industry** collects some data on metals production, although the main production statistics for industry are collected by The Minstat.
- **The Ministry of Health** collects extensive data on mortality, morbidity, disability, and health services
- **The Ministry of Education** collects data on students of professional-technical programs of study at the high school and university levels, as well as on the number of teachers, on physical conditions of schools and on several other topics.
- **The Ministry of Labor and Social Protection** provides data on registered unemployment, disability payments and assistance to poor families.

[10] Korns A., op.cit. pp.11 - 12

- **The Office of Civil Registration (ZAGC)** provides information on births, deaths, marriages, and divorces.
- **The Customs Committee** is an independent agency that prepares monthly data on imports and exports from customs declarations, thus providing a basis for the preparation of statistics on external trade.
- **The Ministry of the Internal Affairs** provides data on internal and external migration, infractions of the law, and railway accidents.
- **The Ministry of Natural Resources and Environmental Protection** provides data on mineral reserves, on various pollutants and on water usage.
- **The Ministry of Transport and Communications** collects data on the stock of automobiles and trucks, and on public roads.
- **The Belarus Railway** provides data on the volume of transportation of cargo and passen gers, fuel use, the condition of equipment and rail lines, and railroad tariffs.

The organizational model of official statistics in Belarus may be called decentralize with strong central coordination by the program of statistical surveys and relatively weaker methodological coordination of surveys managed by ministries because of underdevelopment of common metadata base and of tools assisting coordination of methodological details of surveys by Minstat.

The strengthening of methodological coordination of branch (ministerial) statistics by the Minstat is one of the challenges of the NSDS laying on the critical path of the roadmap.

3. SWOT analysis of the system of official statistics of Belarus

The objective of the SWOT analysis of the existing system of Belarus official statistics is to identify the prerequisites of development of statistics for planning the roadmap of the NSDS. Proper identification of potential STRENGTHS, WEAKNESSES, OPPORTUNITIES, THREATS is necessary for optimizing the implementation of the strategy.

3.1. Specification of the SWOT attributes of the Belarus NSS

3.1.1. Strengths

1. Legal basis of official statistics. The Law on State Statistics of 28 November 2004.
2. Institutional frameworks of coordination, programming and control of statistical surveys (Inter-governmental Committee of State Statistics).
3. Position and competences of the Minister of Statistics and Analyses as the governmental organ of official statistics.
4. Position of Minstat as leading methodological and coordinating unit of centralized and decentralized official statistics.
5. Complex middle - term program of development of official statistics for 2006 – 2010, adopted by the government.
6. Organizational infrastructure of centralized statistical offices covering all the country.
7. Cooperation of statistical offices with main respondents.
8. Adequate level of education and motivated statistical staff.
9. Experienced and motivated managerial staff of official statistics.
10. *Electronic Belarus* - national program of development of information society and e-government in Belarus.
11. Research Institute of Official Statistics and cooperation with scientific institutes within Belarus and abroad.

3.1.2. Weaknesses

1. Statistical culture of respondents and users, especially of small and medium businesses, and households as respondents and of casual users.
2. Scarcity of high level methodologists representing modern approaches.
3. Shortage of analytical staff in state statistics, especially on regional and local level.
4. Traditional methods of questionnaire design – “paper & typewriter driven” questionnaires.

5. Autonomy of particular questionnaire – driven surveys – problems with integrity of data from different surveys and internal redundancy.
6. Underdevelopment of database systems both in centralized and branch statistics.
7. Coordination of branch statistics by Minstat.
8. Underdevelopment of ICT infrastructure both in official statistics, respondents and users.
9. Low level of ICT literacy of statistical staff that not having direct access to the networks (intranet, internet)
10. Very limited use of "electronic signature" blocking electronic data capturing and data interchange within statistical information systems and communication of statistics with other systems.
11. Underdevelopment of statistical metadata and paradata systems.
12. Traditional methods of statistical data processing systems design
13. "Weak" statistical frames – simple registers of reporting units or identification of statistical units on the basis of censuses.
14. Traditional forms of dissemination of information: "publication – driven" philosophy of dissemination, also on websites.

3.1.3. Opportunities

1. *Electronic Belarus* – chance for modern, efficient, reliable, integrated ICT infrastructure for all administrative information and for official statistics.
2. The possibility of the ICT - based modernization of data collection - if statisticians and respondents are equipped in IT technology, electronic signatures and with the access to internet.
3. The possibility of the development of modern ICT - based intranet of official statistics, covering centralized and branch statistics,
4. Advanced implementation and good knowledge of international statistical standards by statistical staff enabling proper, creative adoption of those standards to national requirements.
5. International collaboration of Belarus statistics – active participation of Belarus statisticians in international statistical activities relevant to economic and political possibilities of the country.
6. Determination of statistical staff to learn and to adopt creatively of best statistical practices and to exchange the experiences with other statistical offices.
7. Growing statistical needs users, both – governments, businesses and society; growing demand for statistical information.
8. Cooperation with science shall facilitate implementing of modern methods of conducting surveys, analyses and use of information technologies.
9. Cooperation with mass media.

10. Expected wide access to internet and intranet for dissemination, education, data interchange.

3.1.3. Threats

1. Instability of statistical surveys caused by administrative functions of official statistics in the *planned market - driven economy* model of the country.
2. Decentralized model of statistics introduced by the law of 2004. In statistical services of other ministries the borderline between administrative data and statistical data is fuzzy and may cause troubles with the obeying of the principle statistical confidentiality.
3. Relatively weak position of statisticians in governments and businesses – statisticians are treated s the "auxiliary personnel".
4. Access to administrative records of other governments for statistical purposes – need of better coherence of laws of ministries with the Law on State Statistics.
5. Use of statistical questionnaires and microdata for non-statistical (administrative) purposes may discourage potential respondents and increase the non - response rates.
6. Autonomous development of administrative information systems, administrative records and their non – integrated computerization may cause disintegration of information infrastructure of governments, and indirectly the disintegration of statistical system.
7. Relatively low level of salaries of high level analysts, methodologists and IT staff in official statistics.
8. Financing of statistics from government budget – relatively low political priority of financing of statistical surveys from government budget.
9. Decreasing commitment of businesses and households to cooperating with statistics as respondents, high non – response rates of some groups of businesses (SME) and households (very low and very high incomes, self employment households).
10. Over-interpretation of the principle of statistical confidentiality.
11. Under-interpretation of the principle of statistical confidentiality.

3.2. STRENGHTS. How to strengthen the STRENGHTS.

1. Legal basis of official statistics. The Law on State Statistics of 28th November 2004.

Legal basis of the official statistics of the Republic of Belarus is the *Law on State Statistics* of 28th November 2004. It is coherent with the *Fundamental Principles of Official Statistics* and with other basic recommendations of international statistical organizations, i.a. the *ISI Code of Statistical Ethics*. The *Law* is clearly determining the competences (rights and duties) of particular classes of stakeholders of statistical

processes (respondents, users, statistical services). It guarantees strong position of the chief statistician of Belarus (rank of the minister – member of the cabinet) and of the central statistical office (rank of the ministry within the central government administration).

The *Law* introduces also the regulations specific for the functions of official statistics in planned market – driven economy, that are not common in other market driven economies. These regulations refer to the penal responsibility of respondents for the quality and timeliness of input data, for the refusal of participating in mandatory surveys.

Statistical services are also given the right to control the correctness of input data by accessing administrative records of respondents. Statistical offices have also the right to site the respondents to the court for financial penalties in the cases mentioned above. So rigorous regulations seem to be necessary in the actual period of transformation of the Belarus economy (i.e. the *planned market – driven economy*), in which the state - owned or state - controlled enterprises and other units may be interested in delivering incorrect input data. However one may expect that in the future, when the functions of control of administrative records by statistical offices and other administrative obligations of official statistics are reduced, the control functions of input data will be limited to purely statistical methods. Therefore official statisticians should learn modern achievement in statistical data editing and implement those methods in practice.

Legal frameworks of official statistics of the Republic of Belarus are coherent with international recommendations. The *Law on State Statistics* has created solid legal foundations for modern statistical information system of the country. The model of official statistics embedded in the *Law* may be characterized as the centrally coordinated (by the *Inter-governmental Committee* and the Minstat) system of decentralized statistical production and dissemination (between Minstat and other ministries and governments) of statistics. This model needs strong, effective coordination of statistical programs, methodologies and standards by the Minister of Statistics and Analyses.

The progresses in the development of market - driven economy and stepwise reduction of administrative control of state owned enterprises by the government will likely create the need of changing the regulations concerning non-statistical functions of statistical services. It seem that the control and penalty functions will be moved from statistics to administrative information systems of governments.

2. Institutional frameworks of coordination, programming and control of statistical surveys - Inter-governmental Committee of State Statistics.

The main coordinating and programming institution of official statistics is the Inter-governmental Committee of State Statistics. Legal basis for this institution is the *Law on State Statistics* of 2004. The Committee is chaired by the Deputy Prime Minister. The acting vice-chairperson is *ex officio* the Minister of Statistics and Analyses. The members of the Committee are high level representatives (as a rule - deputy ministers) of the ministries and other central governments involved in the conducting of official statistical surveys, analyses and research works. The Committee has full com-

petences in the field of programming statistical activities of the national systems of official statistics of the country, both centralized and decentralized statistics.

Effective work of the Committee requires careful preparation and pre-coordination of proposals of the program of statistics on the level of inter-ministerial working groups for each domain of statistics and the updating of the program following the needs of main users. To achieve that objective, we recommend the strengthening of the executive functions of the Ministry of Statistics and Analyses as the coordinator of the processes of programming and methodological coordination of all statistical activities on the level of working groups mentioned above. The Minister of Statistics and Analyses would fulfill those coordinating duties with the help of departments of methodology and coordination of surveys of the Minstat and the Research Institute of Statistics. Those departments need quantitative and qualitative strengthening. Inter-ministerial groups of experts for specific domains of statistics may be helpful in the programming and coordinating activities.

3. The position and competences of the Minister of Statistics and Analyses as the central government organ of official statistics

The Minister of Statistics and Analyses is the central governmental organ of official statistics. Leading statistical competences of the Minister of Statistics and Analyses should be accepted in all the laws regulating the competences of other ministers and other governmental institutions (e.g. Central Bank) involved in the production of official statistical data or managing administrative records used for statistical purposes.

Therefore in the legislative processes, i.e. in the processes of drafting and voting all laws, that are relevant to the information infrastructure of the country, the Minstat should analyze carefully all "information components" contained in the drafts of the laws and the potential impact of those component on official statistics, and react actively – if necessary - for providing the coherence and integrity of those components from the point of view of the NSS.

4. The position of the Minstat as the leading methodological and coordinating institution of centralized and decentralized official statistics

The position of The Ministry of Statistics and Analyses as the leading methodological and coordinating institution of the national system of official statistics should be supported by strengthening the methodological capacities of Minstat.

High priority should be given to the development of methodological capacities of the central methodological and coordinating departments of the Minstat, and the strengthening of methodological sections in specific branch or domain oriented departments. The skills of methodological staff should be strengthening by systematic training of experts working in methodological departments and units, and by the creation of good conditions of their professional development (participation in research projects, cooperation with academia etc.).

The Research Institute of Statistics of the Minstat should play leading role in the creating of scientific foundations of new surveys, in the development of new methodological approaches, in creative adoption of international methodological standards to national conditions, their experimental implementation and dissemination of modern methodological knowledge among statistical staff of centralized and decentralize official statistics. National system of statistical education coordinated by the Research Institute of Statistics should be an effective dissemination and implementation of modern methodological knowledge in statistical practice.

5. Complex governmental middle - term *Program of development of official statistics for 2006 – 2010*

The Minstat has elaborated the complex middle - term *Program of development of official statistics for 2006 – 2010*. The *Program* is specifying mail goals and tasks of official statistics, the priority actions planned to be undertaken in all specific areas and domains of statistical surveys and analyses, the investments necessary for the development of statistical infrastructure of the country, the implementation of modern information technologies, their expected results, impacts and implementation strategy in state statistics, as well as the resources needed for the implementation of the *Program*, the mechanism of its realization and the plan of strategic actions.

The *Program* mentioned above seems to be an efficient tool for implementing the National Strategy for the Development of Statistics (NSDS). Its seems necessary the current monitoring of the realization of the *Program*, and regular (annual – bi-annual) updating ("rolling "5-year program) on the level of general goals as well as on the level of specific priorities, tasks, actions and resources needed.

The Program is an efficient tool of middle term coordination of centralized and decentralized official statistics. Special priority in the *Program* should be given to the development of integrated methodological approaches and of common tools of implementing (statistical registers and frames, common metadata: glossary of statistical terms and concepts, classifications and other metadata), i.e. all prerequisites of the development of the integrated statistical information system (ISIS).

6. Organizational infrastructure of centralized statistics – CSO and regional structures of statistical offices covering all country

The state (official) statistics of Belarus has developed the structure of statistical offices fully coherent with the structures of regional and local governments. This infrastructure on the levels of *rayon* and *oblast* was created in the environment of traditional collection and transfer of data (paper questionnaires and data processing in autonomous computing centers.

In modern ICT environment it shall be possible to reduce the capacities of local and regional statistical offices used for data capturing and editing. It is necessary from economic and technological point o view. From technical point of view it would be possible to reduce the number of statistical offices on the level of *rayons*, leaving only small focal points for interviewing and for the contacts with specific groups of respon-

dents, subordinated to *oblast* statistical offices. However it seems that the reduction of the capacities and staff of local statistical should not lead to the closing down and full eliminating of the presence of centralized statistics on local level.

The functions of dissemination of questionnaires to respondents, data capturing and editing, on the level of *rayons* will be significantly reduces. But on the other hand the functions of regional statistical offices that are now underdeveloped on the level *rayons* and *oblast*, shall likely be extended, e.g. statistical information services ana analyses for local governments as well as for other users of statistics, direct contacts with respondents participating in specific surveys requiring interviewing (households, business cycle monitoring etc.), maintenance of the network of interviewers of official statistics, should not only be maintained, but also extended and intensified. In specific local situations these functions may be realized from one local office for several regions (*oblast*).

It seems that at present the regional network of local statistical offices is an important strength of Belarus statistics. The optimization of this network is a continuous long term process of optimizing of the information infrastructure of the governments and the state as a whole.

7. Cooperation of statistical offices with main respondents

Cooperation and contacts of official statisticians with main respondents (especially big enterprises and branch organizations of entrepreneurs), that are now related - to some extent - with the functions of control of state - owned or state - controlled enterprises, by official statistics, should be maintained also in the future, but its forms and objectives should be stepwise changed. Parallel with the process of reducing of the control functions of questionnaires from state - owned businesses, statistical offices in their contacts with respondents should develop the education functions, the functions of providing professional information services and analyses, assistance to the respondents in implementing new methods and techniques of data capturing and interchange with statistical offices (e.g. internet questionnaires, use of administrative record of enterprises and governments for statistical purposes etc.).

8. Adequate high level of education and strongly motivated expert staff of official statistics

Experienced, strongly motivated and professional staff is the basic STRENGHT of Belarus statistics. It is the most valuable resource of statistics. One may observe high level of identification of statisticians with official statistics and the Minstat as the place of work.

Therefore investing in human capital of statistics, i.e. in the development of the staff in all forms: professional training, actions integrating the statisticians, improvement of economic condition of employment (level of wages adequate to the skills and responsibilities), upgrading and modernization of the conditions of work, i.a. ICT equipment and modernization of offices, should be given high priority as the critical

factor of development of the most important resource - human capital of national statistics.

Because of the growing importance and share of decentralized statistics in the NSS, it seems necessary to envisage and strengthen the role of Minstat in the development of statisticians employed by other ministries. The position of statisticians in other governments may not always be adequate with their responsibilities and with other services in those ministries.

The Minstat may and should take actions to make the position of official statisticians in all ministries adequate to their role in the NSS and in the information infrastructure of the country.

9. Experienced and strongly motivated managerial staff of official statistics

In the process of transformation of statistical system extremely important role is played by the managerial staff. The statisticians on managerial position in the Minstat, in regional statistical offices and in statistical services of other ministries are the leaders of changes in statistics and in the information infrastructure of the country as a whole. Their leadership, professional knowledge and managerial skills are decisive for modernization and development of statistics.

Therefore it is necessary to invest in the formation of this segment of human capital of official statistics both in Minstat and in other ministries. Especially it is important to initiate or to stimulate the optimization of organization structures of statistical services in the ministries, providing adequate positions of leading statistical managerial staff among other organizational units of and departments of ministries.

The actions of integrating the managers and leaders of official statistics from Minstat and form other ministries will stimulate the progress and coordination of the NSS as a whole. Regular contacts in different forms (seminars, coordinating cations, exchange of experiences, consulting etc.) of managers of statistical units responsible for related surveys are important for strengthening the integrity of statistical systems and managerial capacity of the NSS as a whole.

10. *Electronic Belarus* - National program of development of information society and e-government in Belarus

The Government of Belarus has elaborated and adopted ambitious and progressive program of wide implementation of the ICT and the development of information society in the Republic of Belarus – Electronic Belarus. Although in the program *Electronic Belarus* there is envisage one project directly dedicated to official statistics (task 48), the implementation of all actions specified in the Program will introduce deep changes in the information and technological environment of the statistical system of the country.

The implementation of modern ICT in governments, development of *e-government* services, computerization of administrative procedures, nation - wide implementation electronic signature, introduction of electronic document as official

document equivalent to traditional paper documents, creation of technological conditions of wide access to internet of businesses and individuals, legal and technological conditions for security and confidentiality of information in communication networks, should be envisaged in the NSDS as the foundation of deep modernization of all statistical activities and processes.

The role of this attribute of STREGHT can hardy be overrated. The level of human capital of official statistics should be good basis for effective absorption of modern ICT by the NSS, both by centralized and decentralized statistical services (Minstat, regional offices, ministries and other governments).

11. Research institute of official statistics

Last but not least, the Research and Development Institute of Statistics, created by the Minstat, is the unit which role in the progress and development of official statistics can hardy be overrated. The Institute is providing research and scientific expertise not only for Minstat, but for the whole national system of statistics. It is also an important unit of international collaboration and transfer of scientific achievements, findings and best practices to the NSS.

The Institute should also play important role in the formation of high level professional staff for statistics and encouraging scientists to work for official statistics. Gifted professionals, after getting more skills by participating in research projects, should be offered methodological or managerial positions in statistical offices and services of ministries.

3.3. WEAKNESSES. How to weaken the WEAKNESSES?

1. Statistical culture, especially of small and medium businesses, households and casual users

The level of statistical culture, especially of small and medium businesses and households is relatively low. These stakeholders of the NSS consider themselves mainly as the respondents overloaded by statistical burdens, but not as the potential users of statistics and partners in important information processes in the country. Their participation in statistical surveys is not accompanied by good understanding how important is good statistics for the country, economy and society.

In the Republic of Belarus, as long as the programs of surveys and analyses are driven by rigorous laws and standards (statistical duties and sanctions for non – disciplined respondents), official statistics does not feel the difficulties in receiving the data from respondents and in participating of households and businesses in sample surveys. However in the future, along with the development of market economy, statistics may face the problem of good cooperation with respondents.

Therefore it is necessary to conduct continuous advocacy actions and wide statistical education of the society, explaining the role of statistics in modern economy and information society, and the importance of contributing to this progress by cooperation with official statistics as respondent.

Wider implementation of sample surveys and the surveys on voluntary basis may cause problems of representativeness and completeness of surveys. To avoid that or to minimize the impact of this processes on statistics, it is necessary do develop stronger frames for sampling surveys, to extend the use of administrative records for statistical purposes and to use the techniques of data capturing, which are minimizing the burdens of respondents.

2. Shortage of high level methodologists representing modern approaches.

As it was mentioned in 2.2., in the staff of the Minstat there are high level methodologists in all areas of statistics. However the number of methodological staff does not correspond with the needs of the NSS. The high level experts are often involved in many other activities: management, survey design and redesign, statistical analyses, cooperation with governments, education. They do not have enough time to update their methodological knowledge, to study new developments in world statistics, to elaborate new approaches and to document methodology and its updates.

The methodological staff is concentrated in the Minstat. In practice there are no methodologists on local and regional levels.

There is also the shortage of higher level methodologists in branch statistics (ministries), with the exception of the National Bank of Belarus. In the surveys conducted by ministries traditional, rather conservative methodological approach is prevailing – reporting systems based on administrative questionnaires collected from all relevant units.

It seems to be necessary to increase the number of high level methodologists both in Minstat and in the statistical services of ministries. It should be done by training, by the participation of statisticians in the research projects realized by the Research Institute of Statistics and by the formation of high level methodologists *on the job* - by undertaking methodological research projects and by training on the job of the staff that is expected to develop and implement new statistical methodologies.

The priority domains that need the strengthening of the capacity of methodological staff are following:

- national accountants,
- experts in sample surveys and statistical frames businesses, households, agricultural frames),
- experts in designing surveys and data quality control,
- experts in the field of statistical classifications and other metadata standards,
- methodologists acquainted with international standards and recommendations in specific areas of statistics.

The Minstat as the coordinator of the national statistical system should take care on the development of methodological capacities for itself as well as for the ministries involved in official statistical activities.

3. Shortage of analytical staff in state statistics, especially on regional and local level

The situation in the field of analytical staff is similar to that of methodologists. Good methodological knowledge and analytical knowledge are often complementary. In statistical practice the same experts often work both as methodologists and analysts. They are often also involved in managerial tasks. Because in statistical practice the priority is often given to managerial and methodological tasks, analytical works are realized by lower level experts. Because of that, the analyses elaborated by official statisticians sometimes do not meet the expectations of institutional users. The use of more sophisticated method, econometric methods and more advanced modeling techniques for analyses is rather exceptional. Most of the analyses is limited to the commenting of numbers in statistical tables and graphs.

More complicate situation is on regional levels. There is strong shortage of high level analytical experts in local (rayon) offices. The situation on regional (oblast) level is better, however far from the needs of analytical works that should be carred out for local and regional governments. Anticipating the growth of the requirements of local and regional governments for statistical analyses, there should be envisaged the strengthening of analytical capacities for providing systematic statistical analyses of social and economic situation in regions as well as for elaboration of ad hoc, specific analyses on request of local and central governments. These activities might be realized by statistical offices on local level (*rayon*) for local governments or for local and regional governments by regional statistical offices (*oblast*).

The strengthening of the capacity of analytical staff of Minstat and regional (*rayon, oblast*) statistical offices and the training of analytical staff for statistical services of ministries should be considered as one of the strategic priorities of the NSDS.

The Research Institute of Statistics as the education centre for official statistics may fulfill leading role in the process of strengthening analytical capacity of official statistics, i.a by preparing education programs, respective material for training and providing trainers in cooperation with universities and experts from statistical practice, and the training in the job by organizing joint analytical research projects.

4. Domination of traditional methods of questionnaire design – "paper & typewriter driven" questionnaires

The consequence of the weaknesses (2), (3) and of the relative underdevelopment in the field of the ICT is the domination of traditional methods of questionnaire design. Most of the questionnaires are "*paper and typewriter driven*". Often in branch statistics the questionnaires represent the contents and structure of statistical output tables. Such approach is simplifying the work for statisticians (compilation of aggregates and tables is reduced to the summing up the items from questionnaires), however

it is complicating extremely the work of respondents, it puts on respondents excessive burdens and is lowering the quality of input data and reduces the possibilities of full data editing.

To overcome this weakness it is necessary to elaborate and implement modern methods of the design of input data and their representation in the forms of modern types of questionnaires adjusted to the contemporary conditions of respondents: businesses, governments and households.

Special attention should be paid to the methods of the design of so called *intelligent questionnaires* enabling the integration of data capturing and editing and to uniformed methods of documentation of surveys.

5. Autonomy of particular surveys – problems with integration of data and internal redundancy.

Typical approach in the survey design in the NSS is the autonomy of survey. The topics covered by particular surveys are designed as autonomous information processes in the sense of defining statistical units and their catalogues, statistical concepts, input data, metadata (classifications) independently on other surveys. The surveys are realized as autonomous information processes of data collection, editing and compiling of output tables. The data are stored and archived for each survey, also for cyclic surveys there are created separate archived filed for each cycle of surveying. One surveys means – as a rule – one questionnaire.

Autonomy of surveys in the phase of their design creates serious difficulties of integration of output data. That causes well known problems of comparability, completeness and integrity of data used for national accounts, for inter-branch and intersectoral analyses and structural comparability of aggregates.

To overcome that weakness new methodologies of statistical survey design should introduce the approaches of integrated design of the "key families" (using the terminology of GESEMS) of interrelated surveys covering one subject matter area of economic or social processes. Modern methodologies of integrated survey design should be creatively adapted to the specificity of the Belarus, especially taking into account administrative functions of statistical questionnaires and surveys for some areas of statistics from governments and state – owned enterprises.

6. Underdevelopment of database systems in centralized and branch statistics.

Autonomous design of surveys has created serious problems in the field of developing statistical data bases and time series database systems. The purchasing of modern ICT and of the DBMS software occurs to be not sufficient for development of statistical data bases. It is visible in Minstat as well as in those ministries, which are equipped with quite modern ICT technology. Many data files are stored using modern DBMS software, however the structures of the data is that from "batch processing" era (repositories of particular questionnaires or output tables for each survey cycle).

To overcome that weakness, the concept of database systems for the whole official statistics (including branch statistics of ministries) should be elaborated. On this basis the program of the design and implementation of prototypes of database systems and an integral part of the middle term Program of development of official should be adopted and consequently implemented. The priority should be given for databases storing the data used for national accounts (on aggregated database systems and low level aggregated data bases).

For wide dissemination the database of aggregated time series of general interest, accessible via website of the Minstat is recommended.

7. Coordination of methodology and content of branch statistics by the Minstat

As it was mentioned above, the *Law on official statistics* has introduced strong institutions and tools on the level programming statistical surveys. However in the phases of design of questionnaires, realization of surveys, producing of output data, their dissemination, interchange and storage of data, some incoherencies and weaknesses are visible. The reasons of those weaknesses are - from one side - the results of inconsistency between the laws regulating centralized statistics, branch statistics and administrative information systems of ministries creates coordinating problems. On the other side they are the consequence of insufficient coordinating capacities of Minstat and of relatively weak position of statistical services of ministries on technical level (analysis and adoption of questionnaires by Minstat service, verification of editing criteria and algorithms, analysis of coherence between different surveys relevant to a given subject - matter area of statistics).

Positive results strengthening the efficacy of coordination of branch statistics by the Minstat may be achieved in middle term by implementing:

(a) common statistical frames used by statisticians responsible for different surveys related with the same classes of statistical units,

(b) common metadata base of official statistics used as the mandatory source of metadata for interrelated "families" of statistical surveys,

(c) common methodology of surveys design and their documentation,

(d) common system of training and education of statisticians for the Minstat and the ministries.

8. Underdevelopment of ICT infrastructure of official statistics, respondents and users.

Comparing the NSS of Belarus with other countries it is rather obvious that the technological prerequisite of development of the NSS is deep modernization of the ICT of official statistics and of its information environment. The objectives and actions that shall be undertaken are specified both in the national program *Electronic Belarus*, and in *the Program of development state statistics for 2006 – 2010.* They

have been also specified in the expertise United Nations and World Bank mentioned above.

The Minstat seems to be well prepared for effective absorption of modern information technologies invested in statistical offices. The objective of upgrading the ICT infrastructure should be oriented for providing the access of all subject – matter statisticians, managerial staff, interviewers and administrative staff to ICT and the network linking all statistical services of the Minstat and of the statistical services of ministries.

9. Low level of ICT literacy of statistical staff that not having direct access to ICT networks (intranet, internet) and databases

The limited access of the staff to the ICT has created differences and "polarization" of staff from the point of view of ICT literacy inside statistical offices and between statistical services of ministries. To avoid or reduce negative effects of this "polarization", mainly to minimize the inefficient use of information technologies by the staff not properly acquainted with the relevant software, the following actions should be envisaged in the process of technological modernization of statistics:

- implementing *statistical intranet* covering all workstations of statisticians and administrative staff of the Minstat, regional and local statistical offices and statistical services of ministries,
- elaboration of models of the ICT - based workstations for different classes and professions of statistical staff,
- implementing of application software, metadata bases, database systems used by different classes of statistical staff,
- training the staff in using relevant software, systems and tools relevant for particular professions and experts,
- organizing the helpdesk for the NSS, supporting the users of the ICT.

10. Limited use of "*electronic signatures*" blocking electronic data capturing and electronic data interchange within statistical information systems.

The electronic data collection is one of the most important ways of reducing the burdens of respondents and the costs of official statistics, as well as the improving of the quality of input data. Legal prerequisite of the electronic data collection by

(a) electronic questionnaires,

(b) statistical portal for collecting the input data,

(c) use of computerized administrative records for statistical purposes

is the commonly used electronic signature by respondents, particularly the businesses and other organizational units and – of course - by statisticians cooperating with respondents and users.

The government program Electronic Belarus has envisaged the creation of legal frameworks for electronic inscription in 2007. However the common use of electronic signatures by all respondents will be developed stepwise and will need longer time, especially small enterprises, microbusinesses and private farms.

Therefore official statistics should carefully monitor the processes of dissemination of electronic signature. The process of the introducing of electronic questionnaires and other forms of electronic data collection should be adjusted to the progress of implementation of electronic signatures.

On the other hand one should not forget that official statisticians can introduce electronic data collection without demanding the questionnaires undersigned electronically in those cases, in which there are other reliable methods of autentification and certification of respondents, and the official inscription is not required by the law, e.g. household surveys, optional surveys etc.

11. Underdevelopment of statistical metadata and paradata systems.

The storage and access to statistical metadata and paradata (information on statistical information systems) in the NSS are limited to the storage and access to selected individual metadata holdings (classifications, nomenclatures, program of surveys, organizational information on official statistical offices and services).

The development of integrated statistical metadata and paradata bases is the task to be realized within the NSDS. The metadata and paradata bases should cover all the system of official statistics (centralized and decentralized). The metadata and paradata should be available for the public, on the statistical portal. The navigating in the metadata and paradata files should be possible from any website of statistical services (Minstat, ministries, the National Bank of Belarus and other official statistical services).

12. Traditional methods of statistical data processing systems design

The consequences of the shortage of modern ICT and the autonomy of statistical surveys are the traditional methods of the design of statistical data processing systems. The dominating organization of statistical production is the processing of single questionnaires, even when the database software for processing is used.

The direction of development shall be the integrated processing of data using modern database and data warehouse technologies. This weakness shall be overcome along with the implementation of statistical database system. However the result of that technological upgrading depends on the respective changes of the methods of design of surveys – integration of surveys in the phase of their design statistical data processing based on compiling the output data from data bases.

13. “Weak” statistical frames – administrative registers of reporting units or identification of statistical units on the basis of censuses.

The frames for driving samples and defining lists of statistical reporting units in Belarus statistics, like in many other statistical systems in the comparable stage of development and transition, are constructed on the basis of administrative registers or on census data.

For higher efficiency of statistical system, the optimization of statistical populations, for better samples and better quality of data, the development of so called *strong frames* (special registers of statistical units collecting systematically updated data necessary for deeper classifying of statistical units) should be one of the priority tasks for strengthening this layer of methodological tools of the NSS.

14. Traditional forms of dissemination of information: "paper publication – driven" philosophy of dissemination, also on websites.

Actually basic forms of dissemination of statistical information (data, metadata and paradata) are: (a) statistical publications on paper or CD, (b) statistical tables printed or represented in electronic form, mainly on CD. This "paper - driven philosophy" of dissemination of statistical information is visible also in the dissemination of data via internet, on websites of statistical offices.

The strategic objective of modernization of data dissemination in the NSS is to replace this "paper – driven philosophy" by active and interactive personalized data supplying to individual users or homogenous classes of users, by adopting following approaches:

- providing data to the users on the basis of pre-defined personalized profiles of interest for identified classes of institutional users and for selected individual systematic users (e.g. experts of government organs, VIP's using systematically statistical data etc.),
- providing the access for common users via the end – user friendly data retrieval languages to statistical data stored in statistical data bases: problem or branch – oriented databases, database storing low level aggregates, central statistical database storing time series on the level of macro and mezzo - aggregates.
- friendly access of end – users to all relevant statistical metadata: glossaries of terms, classifications, nomenclatures, methodological comments and explanatory notes to surveys and data,
- access to relevant analyses of interested social and economic phenomena produced within the frames of statistical surveys,
- availability of the software tools and algorithms for computation of derived data by end users who have specific requirements not satisfied directly by the data stored in statistical databases.

3.4. Opportunities

1. *Electronic Belarus* – chance for good, modern, integrated ICT infrastructure for all administrative information and statistics

The program of *Electronic Belarus* is the unique opportunity for complex modernization of the NSS. The progresses in the realization of this program should be monitored by statisticians from the point of view of their specific surveys. The implications of the *Electronic Belarus* for official statistics should be anticipated in the updates of the middle term Program of development of state statistics for 2006 – 2010.

Main conclusions derived from the program *Electronic Belarus* for official statistics are following:

- official statistics should envisage that technical possibilities of electronic data collection form businesses (including the SME), will become common in the perspective of few years,
- electronic data collection from big businesses, from the SME in many branches of national economy, in which the level of ICT use by the SME allows to require the statistical input data in electronic form, and from the governments is possible now !
- EDI (electronic dissemination of information) via internet and via statistical intranet should be implemented now; wide groups of professional users are using now or will be using soon the on-line access to electronic databases (websites of statistical offices and services of governments),
- the possibilities of the use of administrative records for statistical purposes shall be common soon thanks to the computerization of administrative information systems and the realization of the *e-government* program,
- integration of the flows of statistical output data with other information systems of governments,
- reduction of costs of statistical production thanks to the use of ICT and modernization of survey design.

2. Perspective of ICT - based modernization of data collection, when statisticians and respondents are equipped in IT technology, electronic signatures and access to internet

As it was mentioned above, Belarus statisticians are well prepared to the absorption of modern ICT. It seems that the Belarus official statistics after receiving additional resources for the modernization of its ICT infrastructure, in short time is ready to absorb it and to introduce deep modernization of methods and organization of statistical processes, accelerating its way to modern statistical information systems, adopting best, well tested practices of most developed statistical systems of the world and avoiding the mistakes done sometimes by the pioneers.

The implementing of

(a) secure ICT networks,

(b) electronic signature,

(c) computerization of MIS (management information systems) of enterprises and other units,

(d) common access to internet,

are the prerequisites of implementation of

(e) electronic data collection (EDC)

(f) use of administrative records for statistical purposes

(g) electronic data interchange and dissemination (EDI)

(h) metadatabase – driven control and coordination of statistical surveys and data.

3. Perspective of development of modern ICT - based intranet of official statistics, covering centralized and branch statistics.

The unique opportunity of the NSS of Belarus in its actual stage is the development of *statistical intranet* supporting all statistical agencies and services cooperating within the national statistical system (Minstat and other ministries).

However this opportunity would be lost, if particular ministries incorporate "their" statistical systems and services into the administrative information and administrative data processing systems, as their integral parts.

One may observe the propensity of administration to treat statistical processes and functions of administrative information systems as the components of secondary importance that should be subordinated to "basic" administrative functions. e.g. for tax information system basic function is the collection of taxes from citizens and businesses, while production of statistical data or the use of tax records for statistical purposes is treated as excessive or unnecessary burden disturbing the collection of statistical data.

To avail this opportunity, the Minstat should elaborate general concept and functional model of the national system of official statistics, specifying the criteria and rules that should be obeyed by ministries in the design and re-engineering of their administrative information systems. The specification of mandatory functions and contributions to the NSS from basic administrative information systems managed by the ministries and other institutions (especially tax information system, social security information system, information system of financial supervision, registers and information systems of territory, real estate, buildings, dwellings and other objects, etc.).

It is recommended to adopt this model as the official document of the Council of Ministers. The adoption and obeying of the rules specified in the model shall be controlled by the National Council of State Statistics

4. Implementation of international standards and know – how of best statistical practices and their creative adoption to national needs and possibilities

Within the programs of international cooperation and assistance (i.a. United Nations, World Bank, EU - TACIS actions e.a.), the Belarus statistics has the opportunity of accelerated absorption and implementation of international standards and their creative adoption to national requirements.

The Minstat has achieved visible progress on its way of implementing international statistical standards in the NSS. However – as in any country in transition - some international standards can not be implemented directly and some specific national standards (e.g. classifications) can not be replaced by their international equivalents because of specific information needs of the economy or because of administrative regulations which official statistics is obliged to obey and support providing respective information. The implementation of international standards in those areas consists in developing correspondence tables between national and international standards or in developing specific algorithms of transformation of data and metadata from national into international standards.

The problems of correspondence of classifications and nomenclatures are in Belarus statistics well known and the methods of constructing correspondent tables and algorithms are known and used. More difficult problems appear on the level of concepts and definitions, especially in the field of economic statistics, labor market statistics, national accounts (MPS vs. SNA).

Official statistics may avail this opportunity to initiate the implementing of international standards or their adopted versions as the standards used directly for national purposes, both for statistics and for information system of government administration.

The experiences of the countries that have already passed this phase of transition, that nationally adjusted version of international standards, coherent with their global versions, fit well to the needs of economies in transition. Therefore the NSS may be the driving force for methodological progress in economic and social information systems of the country, not only in statistics. Achievements of the Minstat in implementing the SNA and the standards related with the SNA prove that the availing of this opportunity is very realistic.

5. International collaboration of Belarus statistics – active participation of Belarus statisticians in international statistical activities relevant to economic and political possibilities.

The Minstat is using effectively the advantages coming from international cooperation, actively participating in international, multilateral and bilateral cooperation with international statistical organizations and statistical offices of other countries within its economic, organizational and political possibilities.

It is expected, that following the Amendment 10 of the United Nations Fundamental Principles of Official Statistics (UNFP), this cooperation will be continued and developed. International statistical community should feel its obligations follow-

ing from the words of the Amendment 10 of the UNFP to Belarus official statisticians and to the Belarus statistical institutions.

6. Determination of statistical staff to learn and to adopt creatively of best statistical practices and exchange the experiences

Important opportunity of the NSS is the attitude of the statistical staff to learning and creative adoption of new methods, techniques and approaches in statistical practice. Belarus statisticians are opened to the adopting of the experiences and ideas of other statistical offices and systems in the field of methods, technologies and organization of surveys. It should be also stressed creative and active approach of statistical staff to the novelties in statistical work. The Belarus statisticians are implementing new methods, approaches and techniques adjusting them to the reality of social and economic system and to the transitional conditions of the country.

However it is also visible some kind of fears and resistance of subject matter statisticians in the initiating of new topics of statistical surveys, new methodological approaches. It is rather observed some passiveness, waiting for the initiatives from upper levels of management or from outside, e.g. from the top management of the Minstat, from other ministries or from international organizations.

The Research and Development Institute of Statistics of the Minstat may play an important part of the forum of new initiatives related to the programs of surveys, methods and statistical technologies.

7. Growing statistical needs users, both – governments, businesses and society; growing demand for statistical information.

There is observed growing demand of all classes of users – governments, businesses and the public – for statistical information and for other forms of statistical services, including analytical works carried out by professional statisticians. This new phenomenon of the demand for statistics is the consequence of the progress in the methods of governance, of management and the development of information society in Belarus.

If the NSS is able to meet this growing demand, it will fulfill better its mission for the society and economy, as well as will strengthen its position in the information infrastructure of the country.

However if official statistics is not able to react efficiently and timely on this demand, other information systems will take this place in the information infrastructure of the country, leaving for official statisticians the supply of low processed *informational raw material*.

I do not hesitate to say, that nowadays the official statistics of Belarus has its unrepeatable chance of taking its proper place and position as the integrator of the information infrastructure of the public sector. Looking on the experiences of other countries that have passed that "critical stage" of establishing the architecture of the information infrastructure of public sectors and developing the e-government, in

some countries statistics has taken this chance, however in a number of countries official statistics has lost its role of integrator of the information infrastructure of governments and its role is step by step reduced to the compilation of statistical indicators on the basis of existing administrative information systems and administrative registers developed and computerized independently on statistical needs.

8. Cooperation with academia shall facilitate implementing of modern methods of conducting surveys, analyses and use of information technologies.

Close cooperation with scientists and universities is the opportunity of more effective implementing of modern methods, standards and technologies. The Minstat is in good position having close contacts with best universities of the country and having created the Research and Development Institute of Statistics, which may be used as the bridge between academic researchers and experts working in statistical practice.

9. Cooperation with mass media

The cooperation with mass media gives to the NSS exceptional opportunity of wide disseminating of statistics through most powerful tools of dissemination of information: television, radio, national press, international press agencies.

To avail this opportunity the NSS has to elaborate specific methods of cooperating with the media and to organize the units specialized in the preparation of professional statistical information and metainformation for their dissemination by mass media. The dissemination of information by mass media differs much from the traditional dissemination of statistical information. Therefore statisticians contacting the media should learn this specificity to avoid possible mistakes and misunderstandings.

The press releases should be elaborated for each statistical publication and for each dissemination of statistical data, with special reference to the information of high social, economic and political sensitivity. The dissemination of short term information (monthly, quarterly) and publishing of leading indicators may be organized in the form of briefing for mass – media and submission of press releases specially adopted to the interests of the press and formulated in the language of end users, however without the loss of precision and content.

10. Expected wide access to internet and intranet for dissemination, education, data interchange.

The access of the governments, businesses and the public to the internet in Belarus is developing very fast. The acceleration of this process and the development of commonly accessible broadband internet is envisaged in the national program *Electronic Belarus*.

One should expect that the access to the internet will become affordable in few years for most of the households, and will be common for all establishments, may be with the exceptions of very small family farms and microbusinesses (local retail trade). Common access to internet is the revolutionary change of the information environment of official statistics. It is great advantage and opportunity for official statistics. However if his opportunity is not used actively by statistical authorities, the consequence will be that the field of the dissemination of statistics will be taken by more elastic and active ICT firms that do not necessarily obey the principles of statistical ethics and the FP of official statistics.

In the countries, in which statistical offices were rather passive in their dissemination policy in modern ICT environment, the dissemination of statistical information produced by official statisticians was taken by intermediaries – IT business providing commercial information services for the public.

In Belarus the NSS has still the chance to control the primary dissemination of statistical information directly to the end users, with special reference to most demanding users: governments, researchers, financial sector, and education.

Additional opportunity of the NSS in this respect is the development of statistical intranet for governments. Access and dissemination of statistical data to the governments of all levels via e-government networks (internal networks of governments) should be an integral part of e-government project within the frames of the *Electronic Belarus* program.

3.4. Threats

1. Instability of statistical surveys caused by administrative functions of statistics

The instability of statistical surveys in Belarus is mainly the consequence of:

(a) administrative functions of statistics, as a rule for the state – owned sector of the economy,

(b) changes of laws and their information components in the recent phase of transformation of the national economy.

This last phenomenon is typical of all countries in transition.

To protect the stability of the system of official statistics, that is necessary for comparability of data and continuing of time series, the statistical offices both the Minstat and ministries should undertake the efforts, to satisfy- from one side - changing needs of governments, and - from the other side - to produce data following general, national and international, statistical standards.

This threat may cause disintegration of statistical processes and disintegration of statistical data. In the country in transition like Belarus it is necessary to provide additional resources for those two parallel layers of statistical production.

2. Decentralized model of statistics introduced by the law of 2004. Statistical services of other ministries – fuzzy borderline between administrative data and statistical data

New decentralized model of official statistics in Belarus introduced in 2004 will likely stipulate the efficacy of statistical production and dissemination, however the threat of this model is that it may generate the processes of disintegration of centralized and decentralized statistics.

There are two main driving forces of the internal and external disintegration of the system of official statistics in transition country like Belarus:

(a) incorporation of branch statistics as the integral part of administrative information systems of ministries; statistical approaches and methods may be replaced by approaches typical for administrative information system,

(b) fuzzy borderline between statistics and administration may cause the non respecting of the principles of official statistics and the rules of statistical ethics by administration – oriented managers of entire administrative information systems and of the statistical components of information systems of ministries.

Strong centralized coordination on national level (by the Intergovernmental Committee), organizational structures of statistical services different other administrative information systems of ministries (experience of the National Bank of Belarus is good example) and the education of the staff of governments in the field of the specificity of statistical systems vs. administrative information system shall help to reduce this threat.

3. Position of statisticians in governments and businesses

The position of statisticians in governments and businesses is relatively weak and low. Statisticians in the ministries are often treated like the auxiliary or clerical personnel.

The Minstat should take the possible steps to provide proper position of statisticians in ministries, relevant to their position and role in the NSS as a whole. The advocacy actions should help to strengthen the position of statisticians and statistical activities in businesses and other organizations.

It is long and difficult process. The education of the staff of governments oriented to the creation of statistical culture in the governments and in the public sector of the economy. The objective of the strengthening of the position of statisticians in governments is not the creation of better conditions of fork for statistical staff, but the efficacy of statistical system as the information basis of all activities of governments and the quality of information provided to the governments.

4. Access to administrative records of other governments for statistical purposes – need of coherence of laws of ministries with the Law on State Statistics

The Law on state statistics of 2004 has guaranteed the use of administrative records for statistical purposes. However equivalent laws regulating other administrative information systems and branches may cause conflicting situation in interpretation of the rights of access of statistics to different files and records and different interpretation of confidentiality and security rules.

Discrepancies between laws and regulations of official statistics and basic administrative information systems of governments (tax law, social security, banking, different regulations on confidentiality in governments and businesses) are the serious threat for the development of the NSS.

There should be undertaken the action to explaining potential differences in the interpretation of relations between statistical laws and other regulations of administrative records and information systems, explaining the specificity of the use of administrative data for statistical purposes.

5. Use of statistical questionnaires and microdata for non-statistical (administrative) purposes – may discourage potential respondents.

In the period of transition in Belarus, some statistical surveys covering the state – owned enterprises and units play double role:

(a) entire statistical survey,

(b) administrative data.

That twofold nature of statistical surveys is typical for almost all branch statistics (of ministries). However the fact that data from statistical questionnaires collected by ministries, and even sometimes by the Minstat and by regional statistical offices, may be used for non statistical purposes, may discourage potential respondents, increase the level of non-response and influence the quality of input data.

It seems that there is necessary for the period of transition to introduce within the NSS two different kinds of questionnaires: (a) the administrative questionnaires used for statistical purposes, but collected by statistical services, and (b) entire statistical questionnaires that are obeying all the rules and standards of statistics: confidentiality, use only for statistical purposes, statistical approach to errors and non response etc.

In case of state-owned enterprises, for which non aggregated data are needed in the ministries, collection of the data on the basis of the Law of Statistics should not be adopted. The data could be collected on the basis of other laws. Ten those data could be matched with statistical information from other units, respecting the principle of statistical confidentiality. Statistical law should never be used for collecting data used for any administrative purposes and by and government service.

6. Autonomous development of administrative information systems and records and their non – integrated computerization may cause disintegration of information infrastructure of governments

Incorporation of branch – oriented statistical information systems by the administrative systems of ministries and joint computerization of statistical and administrative processes may cause the stepwise disintegration of statistics.

Main reason of disintegration is that the changes in statistical surveys and standards may need the redesign of computerized information systems of ministries. In this redesign the priority is given to administrative functionalities of information systems of ministries, while statistical functions have much lower priority and sometimes are even treated as if hey were negligible. The managers of information systems of ministries and the managers of IT on administrative information systems may not understand the importance of adjustment of statistical components in the systems of ministries. They also may introduce the changes in their administrative systems not taking in to account destructive impact of those changes on the integrity of the NSS and on the quality and scope of available statistical data.

This threat is extremely serious, even dangerous, for the integrity and for perspectives of development of statistics in early stages of development of *e-government*. However the domination of ICT – oriented experts and IT firms (producers of hardware and software) is rather common in the countries without long tradition of the use of modern ICT, not only in Belarus.

Therefore one of the areas of interest of the Interministerial Committee of State Statistics should be the coherence and interoperability between administrative information systems and official statistics, especially in the processes of implementation of the ICT and development of e-government. Official statistics and the Minstat as its central administrative organ - to the possible extent - should not be the passive observer of what IT firms are doing in the field of e-government. The Interministerial Committee and the Minstat, as well as statistical services of ministries should react adequately to the consequences of these threats on statistics, if any disintegration of statistics and administrative information systems is caused by proposed or implemented autonomous e-government and other ICT projects in public sector of the economy.

7. Low level of wages and salaries of high level analysts, methodologists and IT staff in official statistics.

The level of salaries of analysts, methodologists and IT experts in official statistics is – as a rule - lower then in other companies, in financial sector of economy and also in other governments. It is difficult to attract high level experts and young educated, gifted graduates of universities by the salaries equivalent to their skills.

It is commonly accepted that official statistics can not be competitive on the ICT market and on the market of high level economists and analysts. This approach to statistics should be changed. There is no reasonable explanation why analysts with the same skills working outside official statistics and sometimes involved in less complicated tasks working in ministries or in other businesses should be paid better then their colleagues working in statistical offices. Official statistics is in most of the countries the cradle of high level experts for all other governments.

It seems that the most effective way of overcoming the threat of shortage of high level analytical, methodological and IT staff is to invest in training and education of the staff hoping that some of them will choose statistics as their mission. On the other hand any actions leading to the equivalence of wages and salaries of statisticians working on different positions in public sector of economy should be continuously undertaken by statistical services. Any attempts and initiatives of the "betterment" of the economic situation of statistical staff, with special reference to analysts, methodologists, researchers and IT experts may finally bring some results.

8. Financing of statistics from government budget

The financing of statistics from government budget guarantees the stability of financial lows for the surveys and for the maintenance of statistical infrastructure. The budget for statistics is constructed as the budgets for other central offices.

The construction of the government budgets for all offices is based on the *continuity principle* (budget from previous year times the inflation index plus some minor changes for specific additional tasks). In some developed countries there is the principle of annual reduction of expenditures for statistics.

However in the process of transition of official statistics this method of financing may be a threat for proper development of the NSS. In the period of extensive transformation of statistics and its adjustment to the dynamic changes of the national economy, social changes and deep changes of information technologies, the expenditures for statistics should be equivalent to real needs of transition. Those additional needs for financial resources should cover the expenditures necessary for transformation of statistics (ICT, training and re-training of staff, experimental new surveys etc.). However in existing methods of budgeting they may not find its proper representation in the budgets for statistical activities and offices.

In the process of transition the budget for statistics should be based on the costs of tasks realized by statistical offices and services. It is necessary to introduce the calculation of real costs of statistical surveys as the processes of production of information. It should be also proven that investment in official statistics, especially in centralized statistics will bring financial results in other governments, thanks to better information services provided for the by professional statistical service.

Best practices of developed countries that have elaborated the methods of estimation and monitoring of costs of surveys and costs of the maintenance of statistical infrastructure may, be used as good examples for elaborating budgeting mechanisms of official statistics. Elaboration and implementation of the methods of calculating the costs of surveys and maintenance and development of statistical infrastructure, adjusted to the specificity of statistics in transition, shall contribute to avoid that threat.

9. Decreasing commitment of businesses and households to cooperating with statistics as respondents, especially some groups of businesses and households.

There is the global trend of decreasing commitment of businesses and households to cooperating with statistics as respondents, especially some groups of businesses and households. It causes under-representation of some groups of statistical populations, both households and businesses, in surveys and samples (e.g. households with very high and with very low income are underrepresented in the surveys, self – employed businesses do not cooperate willingly with official statistics on voluntary basis etc.).

Statisticians should envisage the processes of the increasing of non - response rates of the SME (small and medium enterprises) and households.

Nowadays in Belarus the process of growing non – response is in rather early stage, however one should expect the acceleration of growing non response rates of some groups of respondents and possible lowering of the quality of input data along with the development of market economy, progresses privatization and the reduction of the share of state - owned and state – controlled businesses and organizations.

To minimize the consequences of this threat, the official statistical services (Minstat ad statistical services of ministries) should undertake the following actions:

- use administrative records as the alternative or auxiliary source of statistical data
- use of traced data approach, minimizing the necessity of data collection directly from the SME,
- for sampling surveys - the anticipation of the growth of non - response rates by driving larges samples for the classes of statistical units that show higher "propensity" to non - response.

To reduce the impact of this threat on statistical production processes, the statisticians should also look for alternative sources of input data for those surveys, for which traditional, questionnaire – oriented approach, is risky for completeness and quality of data. The combined use of administrative records (if relevant), reduced questionnaires and the use of so – called "trace data" coming from different independent sources, as well as the use of *very small samples approach* (based on *strong frames*) are the recommended strategies that may help to reduce the consequences of that treat.

10. Over-interpretation of the principle of statistical confidentiality

The principle of statistical confidentiality is one of the most fundamental principles of official statistics. It should be obeyed *unconditionally* both for centralized and decentralized statistics.

However, if this principle is interpreted in a bureaucratic way, it may limit significantly the scope of possible statistical production and the usefulness of official statistics for local governments, businesses and researchers. The problem of statistical confidentiality is extremely difficult for small scale and medium scale national economies (like Belarus) and for regional statistics.

It seems that for Belarus the problem of statistical confidentiality is well understood by official statisticians as extremely important. Main problem is caused by "semi – monopolistic enterprises", i.e. of the concentration the activities of some branches in one or in very few enterprises. In some branches of the economy there is only strongly one dominating enterprises.

It is necessary to introduce clear and realistic interpretation of statistical confidentiality distinguishing

(a) *sensitive data*, that should never be published if there is the potential threat of disclosure, and

(b) "non – sensitive" data that may be published because of its economic or social neutrality or because they are disclosed in other information systems on the basis of the laws other then the law on official statistics.

The problems of interpretation of statistical confidentiality and elaboration of the criteria of identification of sensitive and non sensitive data are actual not only for Belarus, but for all small and medium scale national economies. It seems that this issue should be taken, consulted and agreed on international level (i.a. UN Statistical Commission and the CES in the region of Europe).

11. Under – interpretation of the of the principle of statistical confidentiality

To the contrary, there is in Belarus the threat of under – interpretation of the principle of statistical confidentiality. That is the consequence of specific information needs of governments and state - owned enterprises in *planned, market – driven* economy of Belarus. In former centrally – planed economy statistical questionnaires from state owned units of economy were one of the form of administrative questionnaires.

Processes of privatization have not changed the approach of some governments to statistical questionnaires. On the level of central governments the understanding of the importance of statistical confidentiality for the quality of information is rather common. However on the level of regional and local governments and for branch oriented experts in governments statistical questionnaires are treated as any other source of administrative documents.

For avoiding that threat it is necessary:

- to educate and to explain to the institutional users of statistics, especially branch oriented and regional government the regulation of statistical confidentiality in the Law on State Statistics and in the UN Fundamental Principles of Official Statistics (the Resolution on UNFP was accepted by the Government of Belarus as the member of the UN),
- to elaborate the instruction on statistical confidentiality explaining the role of statistical confidentiality and practical approaches to its implementation in practice (presenting best practices) and to adopt this instruction as the of-

ficial document of the Intergovernmental Committee of State Statistics and to disseminate that document to all interested parties,

- in the situations in which the questionnaires collected by statistical offices have also be used as the only source of administrative data, it could be introduced the change of the character of the questionnaire from statistical document into administrative document, collected not on the basis of the Law on State Statistics, but on the basis of other administrative laws. In those situations the surveys based on such documents will use administrative data for statistical purposes. However statistical offices should not be involved in direct supply of those data for administrative users. The dissemination of those data should be organized by respective governments within their information systems. Official statistics, especially statistical IT exerts, may temporarily help the governments responsible for those specific administrative documents, by assisting in data capture, data editing, conversion on electronic media (if necessary), however not on the dissemination of information.

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The SWOT analysis presented above is specifying main strong and weak aspects of the official statistics of Belarus, its opportunities and treats in the recent period of transition of Belarus economy.

In the realization of the NSDS the systematic monitoring of the SWOT and its updating (e.g. bi-annual) is recommended. It will be helpful to identify better the priorities on the roadmap of development of the NSS of the country.

4. Mission of official statistics in the Republic of Belarus

4.1. The mission of the NSS of Belarus in the light of Law on State Statistics.

The duties, the rights of all stakeholders of the NSS (governments, businesses and individuals) as well as the functioning of the NSS and the stakeholders of official statistics in Belarus is determined in the Law on State Statistics of 28th November 2004 No. 345-3.

The Law of 27th November 2004 was preceded by the Law on State Statistics of 1997, that has adjusted the principles of the state statistics to Belarus to basic international standards and recommendations, including the Un Fundamental Principles of Official Statistics of 1993.

The 2004 Law is finalizing the process of developing legal basis of official statistics coherent with the international principles and adjusted to the conditions of market driven economy in transition, but also is taking into account specific functions of governments in the *planned market - driven economy* of Belarus. It has also introduce important changes in the organization and functioning of the system of official statistics[11].

Article 3 of the Law on State Statistics states that the basic tasks of state statistics are:

f. Development of scientifically based statistical methodology and its improvement in compliance with the national and international standards in the field of statistics;

g. Collecting, processing, compiling and analyzing economic and social statistics, using scientifically based statistical methodology; and

h. Disseminating statistical information to governmental authorities and other users.

Article 5 states that the main principles of state statistics shall be as follows:

- *Scientific basis and objectivity of statistical data;*
- *Relevance and timeliness of statistical data;*
- *Confidentiality of primary statistical data;*
- *Comparability of statistical data;*
- *Accessibility and openness of summary statistical data;*
- *Professionalism and independence in performing state statistical activity*.

The principles listed above (based on the United Nations Fundamental Principles of Official Statistics), were not explicitly listed in the previous version of the Law of 1997. All ten of the principles of official statistics are mentioned directly or indirectly in the Law.

The 2004 Law has introduced important qualitative changes comparing with the 1994 Law. The most important are following

2004 Law:

[11] See Korns A., op.cit., p 5.

- Defines basic statistical terms, including original data, respondent, users, and summary data.
- Mentions the basic principles of official statistics in more detail than previously;
- Strengthens the confidentiality provision of the law as explained below;
- Creates legal basis of compiling the statistical register;
- Defines the principles of the dissemination of statistical data, which mentions that the Minstat may disseminate "depersonalized primary statistical data that do not allow identifying individual respondents".

On the basis of the 2004 Law the Belarus statistics continues the process of transformation of the NSS and its modernization. 2004 Law is the legal basis of the NSDS.

The tasks and actions to be undertaken in the way of development of the NSS are specified in the Program of development of state statistics for 2006 – 2010, which is the basis for elaboration of annual programs.

On this legal basis the specific aspects of the mission of official statistics could and should be specified in the light of the following new developments and phenomena in social and economic life and in information technologies:

- globalization processes
- development of more open, market - driven economy
- continuously changing role of governments and institutions in the economy
- development of new information needs of businesses
- use of modern ICT in the economy
- development of e-government
- development of information society
- development of knowledge – based economy

In defining of specific aspects of the mission of official statistics, it is necessary to refer to the formulations of the tasks of official statistics in the *2004 Law on State Statistics* (Articles 4 – 6), particularly extended tasks:

- development of science-based methodology in compliance with the national and international standards,
- collecting, processing, compiling, accumulation, storage and protection of statistical information,
- dissemination of statistical information as the public goods,
- tasks of official statistics in the field of socio – economic education of the society,
- contributing to the development of information culture in the society
- functions of official statistics in relation to other information systems of governments, other institutions, science, businesses and the public.

The formulation of the mission of official statistics is the basis for the formulation of the vision of long term development of official statistics.

4.2. Role of official statistics in the information infrastructure of the country (society, economy, state)

The characteristics feature of all modern economies is high level of development of infrastructure in all fields of economic and social life. One of the fundamental layers of the infrastructure of national economy is the *information infrastructure of the state* composed of information systems and resources organized, developed and maintained within the frames of the laws, providing information security of the society, businesses and providing necessary information for governments.

The national system of official statistics (NSS) is one of the most important layers of the information infrastructure of the state and of the national economy as a whole. The mission of the NSS as the layer of the information infrastructure of the country should be focused on:

- The determining of information standards (concepts and definitions, classifications and nomenclatures, indicators, methods of measurement, criteria of quality of information) for representation of social, economic, ecological, technological and other phenomena and processes of real life, for all infrastructural information systems, with special reference to the information systems of central and regional governments,
- Dissemination of statistical information and metainformation as the public good for the society,
- Contributing to the development of the information culture of the society, businesses and governments by the participating in the process of education as the contribution to the development of information society.

The specificity of the NSS as the infrastructural information system is its *universalism*. Official statistics is covering *all spheres and areas* of social and economic life, technological and ecological phenomena and processes. Because of that, the official statistics, especially national statistical offices (Minstat and regional offices and statistical services of ministries) should play coordinating role by elaborating information and metainformation standards for the use of other stakeholders of information infrastructure of the country.

In the Republic of Belarus it was adopted the program of development of modern, ICT-based information infrastructure of the country – *Electronic Belarus* as the foundation of information society and knowledge – based economy. The NSS of Belarus and the Minstat as the central government organ of official statistics should play an important role in providing information coherence and quality of information in the whole information infrastructure of the country, in infrastructural systems and resources relevant to subject matters scope of statistics, by defining standards for common use, disseminating the information as the public good and contributing to the progress of information culture of the society.

4.3. Mission of official statistics to the society

Main mission of official statistics in this stage of development of the country is to support the development of *information society* in Belarus. By *information society* we understand the society of *well - informed citizens*, representing respective level of information culture and having the access to all relevant and pertinent, information, meeting quality criteria and the criteria of social usefulness for citizens and economic subjects in democratic society and in market - driven economy.

The NSS shall realize this mission by providing the access and by disseminating the information and relevant metainformation to the society as the public good, using all accessible methods and techniques, i.a.:

- *National statistical parainformation base* accessible via websites, statistical call centres, informing the public on the access to available statistical information and metainformation, including the detailed program of statistical surveys, publications and available files of data in other forms, produced by the Mistat, the National Bank of Belarus as well as by other ministries that are the producers of official statistical data,
- *Public metadata bases* covering:
  - (a) glossaries of concepts and definitions,
  - (b) classifications and nomenclatures,
  - (c) statistical methods and procedures,
  - (d) statistical standards for protection of data quality, confidentiality, integrity.
- *Public statistical databases* in the website of Minstat:
  - (a) basic statistical aggregates
  - (b) the database of aggregated macroeconomic indicators and time series of aggregated data,
  - (c) specialized branch - oriented databases,
  - (d) specialized problem - oriented and regional database systems.
- *Active participation of official statisticians in statistical education of the society*, especially information on the NSS and the use of statistical information for secondary schools and for the students of the universities on all direction of education, with special reference to economics studies, administration and law and engineering faculties. Production of statistical publications should be adjusted not only to the needs of institutional users, but also to the needs of teachers, pupils in secondary schools. Popularization of statistical knowledge by organizing *statistical days* in central, regional and local statistical offices for schools and universities will profit for the position of statistics and for statistical literacy of the society in longer tems. The organizational structure of Minstat (regional and local statistical offices in all regions – *oblast* and *rayon*) may be very helpful in organizing the actions for the schools, universities and other organizations involved in the development of information society in Belarus.
- *Active cooperation with mass media*. The dissemination of statistical data and relevant statistical knowledge via mass media. Regular press conferences and briefings for mass media should be used as the way of dissemination both the data relevant methodological knowledge and information about the NSS.

4.4. Official statistics and economy

The mission of official statistics toward the economy, i.e. the enterprises and other stakeholders of the market, is focused on the following:

1. *Information symmetry of subjects on the market*. The objective of the NSS should be the protection of information symmetry of all subjects operating on the market by disseminating and supplying relevant statistical information and metainformation to businesses informing them on economic situation of the country as a whole, on the situation of particular branches of economy and regions, on the business cycles.
2. *Minimization of the information burdens of businesses* and other organizations as the respondents: optimization of the scope of statistical information and minimizing the redundancy, replacing statistical questionnaires by the use of administrative records for statistical purposes, electronic data collection, optimization of sample surveys.
3. *Dissemination of statistical metadata* and methodological knowledge useful for more effective use of statistics by businesses. Providing analytical services for enterprises and for organization of enterprises. Local and regional statistical offices of the Minstat may play important role in providing statistical services to enterprises and other organizations.
4. *Transparency of the market processes for businesses.* Statistical data disseminated by official statistical services for all interested parties should help the businesses to get objective, standardized and multi – aspect statistical information necessary for evaluation of the development of the markets by businesses.

4.5. Official statistics and governments

Providing statistical data and information services to the governments was the main, and in some areas of statistics – the only task of national statistical services. In Belarus, as well as in all countries that have passed from the model of centrally planned economy to the market driven economy, the priority task of official statistics in the period of centrally planned economy was to provide information to the central governments. The information needs of local governments and social organizations, researchers and citizens were of secondary importance or were neglected at all.

Defining the mission of the NSS in market – driven economy, in information society and in the process of development of knowledge – based economy in Belarus, it is necessary to change the priorities of official statistics. The priority task of the NSS in *planned market - driven economy* of today, is and will be the providing of statistical information to the governments, however this priority should not limit the supply of information to all other groups of users.

According to the UN FPOS (UN Fundamental Principles of Official Statistics), all users of statistics should be treated equally: governments, businesses and the public (Amend-

ment 1). It means that in the process of elaboration and adoption of the program of statistical surveys and the policy of dissemination of information, the needs of all classes of users should be taken into account and all stakeholders of statistical processes should be equal in the light of their information rights and duties.

In practice of Belarus, the most extensive users, that have well defined information requirement, are governments. Other groups of users are rather passive in expressing explicitly their information needs for statistical data and metadata. They are often satisfied when they are given the access to statistical output data produced on the request of governments.

The problem that should be solved in defining the mission of Belarus statistics to the governments are following:

- *Active monitoring of information needs* and anticipating the changes of the information requirements of central governments. Elimination of redundant and useless information in the process of programming the surveys.
- *Organizing the interchange of statistical data and metadata* between the Minstat, ministries and regional governments; minimizing the redundancy and excessive differences and variety of indicators describing the same or similar economic and social phenomena.
- *Offering advanced analytical and information services* to the experts and divisions in the ministries and regional governments by statistical offices of Minstat and statistical units of the ministries, including training, education and the research works provided by the Research Institute of Statistics.
- *Development of regional, urban and local statistics*. These areas of statistics were heavily underdeveloped in the period of centrally - planned economy. In the market driven economy and along with the development of self – governance on the level of regions and towns, regional governments need more extensive statistical support.
- *E-government*. The Minstat and other statistical units should support the program Electronic Belarus, supporting its realization by providing metadata standards for all infrastructural information systems of the country.
- Special attention should be paid to the *statistical support of the processes of government budgeting* on national and regional levels. Official statistics should develop the sets of indicators used for optimal drafting of government budgets, for monitoring of the realization of the budgets and for the evaluation of the effects of use of public funds by governments and by other organizations as the contribution to optimization of public governance. The role of official statistics as the information support of modern budgeting can hardly be overrated.

4.6. Official statistics, R&D and education

Taking into account the government program of Electronic Belarus, in the redefined mission of official statistics, high priority should be given to the information needs of research. The information support of researchers and research institutes is decisive for the development of knowledge - based economy.

The mission of the NSS the R&D is to monitor the information needs of the users in specific domains of research that use statistical data as their basis *raw material* for production of their scientific findings, e.g. general economic research institutes and branch - oriented economic institutes, institutes of social sciences, ecological research as well as R&D centers supporting the enterprises. The results of this monitoring should be implemented into the practice in the programming of statistical surveys and in the data dissemination policy of the NSS (contents and scope of statistical databases, publishing policy, access to metadata, para-data bases, *statistical helpdesks* etc.).

Long - terms goals of supporting the development of the information society in Belarus will be achieved by *the contributing of official statisticians to the education*, especially the education on secondary and university levels.

It seems that nowadays the priority should be given to the systematic statistical education of teachers on all levels of education (primary, secondary, university). The knowledge of global and national statistical systems, on specificities of statistical methodology, on deontological principles of statistics, etc., is not common enough, even among those, who teach mathematical statistics at the universities and high schools.

We take the liberty to recommend to the Minstat to initiate the organization of special courses on the organization and principles of official statistics (global and national) and on the methods and techniques of official statistical surveys, especially for economic and administration faculties and for post – graduate studies for civil servants. These educational actions will bring good results not only for statistics, but also for the governments and society.

4.7. Official statistics and international organizations.

The globalization processes require coherence and cooperation of national statistical systems with within the global system of official statistics coordinate by the UNSC (United Nations Statistical Commission). Close cooperation of the Minstat as the coordinating organ of the NSS of Belarus with international statistical organizations and their active participation in relevant actions and projects is indispensable for coherent development of national statistics.

International cooperation of the NSS of Belarus with global statistical systems should be an integral part of the middle term and annual programs of statistical surveys and methodological works, covering:

- *Implementation of statistical standards* recommended by international organizations, which the Belarus is taking part in.
- Realization of *statistical surveys recommended by international organizations*, including statistical censuses.
- *Coordinated supply of statistical data* on Belarus to international statistical organizations and information services.
- Organizing the *access of national users of data interested in international statistics*, to respective foreign and international data bases and files.

- Control of the *coherence, integrity and comparability of national data* with international standards, organizing the actions of bringing data to comparability and integrity in case of methodological changes.
- Development of *national methodologies in coherence with international* methodological recommendations and standards.

International cooperation of the NSS should be developed both on global and regional, multilateral and bilateral platforms.

The experience of the Belarus statistics shows that highly effective is bilateral cooperation oriented for specific statistical areas with the countries that have elaborated and tested best statistical practices implementing international standards (e.g. Belarus – Dutch cooperation the field of household surveys, the actions of IMF, World Bank, UNICEF, bilateral cooperation of Belarus with developed Nordic countries).

The exchange of experiences with the countries that have passed the process of transition from centrally planned economies to market economies seems to be of special interest and value for Belarus statisticians in their way of transition of the NSS. The former centrally planned economies that are more advanced in the process of transition to the market economies, including the countries that are in the process of integration with the European Statistical System of the EU an have the experiences in complex adopting of the standards of the European Statistical System, will be also of use for the Belarus statistics. The sharing of experiences and cooperation of national statistical offices of those countries with Belarus statisticians is the realization of the Amendment 10 of the Resolution of the ECE of 1992 "Fundamental Principles of Official Statistics".

4.8. Conclusions

Summarizing the above discussed aspects of re-defining the mission of official statistics for the National Strategy for Development of Statistics, the following priorities should be stressed:

- *The integrating role of the NSS* within the information infrastructure of the country, with special reference to the quality of social and economic information.
- *Coordinating function of the Minstat* as the central organ of official statistics of the country for statistical system and for statistical components in administrative information systems of governments and other organizations managing infrastructural information systems.
- *More active participation of the NSS* in the projects of implementation modern ICT in the country, especially in the program *Electronic Belarus*.
- Equal statistical rights and duties of main stakeholders of the official statistical system: governments, economic units and citizens.
- *Statistical information and metainformation as public goods* available for the society and institutional users.

- *Statistical education and cooperation* with academia and research institutes as the contribution of the NSS for long term development of information society and knowledge – based economy in Belarus.

5. Vision - target model of Belarus NSS

5.1. The long – term target model of the NSS – need and goals

The long - term target model of the development of the information system of statistics oriented for 2015 is the list of scientifically realistic hypotheses that should be taken into account for elaboration of middle term programs of development of statistics. It is necessary for proper identification of priorities and actions that will have long term, sustainable impact on statistical system.

The long term vision of the NSS should cover:

1. forecast of profiles of potential users of data and the needs of other stakeholders of statistical processes and their profiles,
2. potential expected impact of globalization on statistical information systems and their functions,
3. impact of modern ICT on information processes on global and national scale, on the information infrastructure of the world and countries, and the place of the NSS in that infrastructure,
4. expected development of relations between the NSS and other information systems, with special reference to the development of *e-governments*, *e-economy* and their impact on statistical processes,
5. organizational, institutional and legal issues and arrangements of information infrastructure of the country and the of official statistics,
6. role of official statistical standards in the information processes and information infrastructure of the state and the national economy,
7. information architecture of official statistics and statistical processes (metadata bases, data bases, storage, dissemination)

On the basis of hypotheses related to the issues specified above the main directions of the development of official statistics on the national level may be formulated:

Ad 1. *The needs for information* verified by professional official information producers, i.a. by official statistics will be growing. Official statistics is expected to take the responsibility for producing and disseminating *"attested"* economic and social information. Interest of the public, businesses and governments in statistics shall grow.

Ad 2. *Globalization processes* shall be accompanied by the development of global, more integrated statistical systems. National statistical systems will be to larger extent *the subsystems of global statistical system*.

Ad 3. *Technological constrains* of statistics existing in many countries will disappear. The common use of modern ICT, global networks and mass storage by governments, households and businesses will change the organization and tech-

nologies of statistical production processes, storage, dissemination, access, processing and techniques of use of statistical data.

Ad 4. *Deep functional integration* of entire statistical systems, administrative information systems and management information system will become common. Statistical processes designed, coordinated and managed by professional statistical services will be realized within the frames of other administrative information systems.

Ad 5. *The coordinating role of official statistical agencies* in the field of contents, standards and methodology shall be growing, while the involvement of statistical services in the production of data may be relatively decreasing.

Ad 6. *Statistical information standards and metadata* shall have fundamental role for the contents, the scope and the quality of social and economic information in professional infrastructural information systems on national and global scale.

Ad 7. *Database technology* shall be common for data and metadata storage, processing, archiving and access (data bases, data warehouses, data repositories etc.).

The upgrading of technological level of official statistical systems and of statistical offices is decisive for the strategy of development of statistics for the countries in transitional phase. If statistical offices will not modernize their technological infrastructures before other governments do that, the functions of production of information will be taken over by respective governments and will be incorporated to administrative information systems.

5.2. Role of official statistics in the information infrastructure of the country

The destination model of the national statistical system is the integrated statistical information system as the coordinator and producer of professional statistical information in the ICT driven information infrastructure of the country, coherent with global statistical system. The development of modern information infrastructure of Belarus within the frames of the national program *Electronic Belarus* will grow the need of quality control and coordination of information processes in all infrastructural information systems.

The NSS is predestinated to play the standardization, coordination and quality control for social and economic information circulating in the infrastructural information systems, non necessarily statistical ones. The Minstat as the central coordinator together with other statistical agencies of ministries should strengthen their role in that respect.

The practical tools of coordination, quality control and standardization of socials and economic information in infrastructural information systems of the country shall be:

- *Statistical metadata bases* (standard classifications, nomenclatures, glossaries of terms and concepts, standard methods of measurement of social and economic phenomena and indicators, criteria and methods of quality control of quantitative data),

- *Statistical registers and frames*, with special reference to *strong frames*,
- *Catalogues* of official statistical indicators,
- *Statistical data repositories* providing the access to standard data as public good.
- Statistical *parainformation* systems assisting the navigation in the information environment of foreign and global statistical information systems.

5.3. Target functions of official statistical services

As it was mentioned above, official statistical offices will be less involved in the management and realization of technological processes of statistical production, and at involved in development of methodological and advanced analytical works for institutional users, especially for governments.

The decision that are facing the Belarus authorities is, what will be the main function of statistical offices in the information infrastructure of the country and what kind of information services will be provided by them to other governments:

- production of basic statistical data for further analysis and processing by the users,
- providing advanced statistical services for decision makers: analyses, prognoses, simulation modeling based on statistical data etc.

The question that should be answered now, in the process of implementation of the NSDS is, what model of division of responsibilities and tasks between statistical offices and services and other users will be chosen, with special reference to the division of labor between official statistics and other governments.

The role of the Minstat as the central coordinator of official statistics as the specific segments of the information infrastructure of the country seems to be out of question. The competences of the Minstat determined by the 2004 Law cover

- the coordination of metadata for official statistics and all related administrative information systems (definitions of terms, classifications, nomenclatures, codes etc.),
- coordination of the programs of surveys and of methodologies;
- maintenance of statistical frames;
- design, organization and realization of surveys;
- dissemination of data,
- maintenance of statistical resources,
- education, research in official statistics,
- international data interchange.

On regional level, the role of regional and local statistical offices will be changed in long term. Due to the reduction of the burdens of data capturing and editing on paper questionnaires, the structure of tasks of regional and local statistical offices will be stepwise

changed. Statistical offices on the level of regions (oblast) will be more involved in providing information services for regional governments and cooperation with respondents and users, and organization of surveys and statistical field operations. As far as the local statistical offices are concerned, their main functions in longer term will be focused on the organization of data collection by face to face interviewers, contacts with respondents and to some extent cooperation with local authorities. Their role in collection of data from businesses and other units will be significantly reduced.

The role of statistical services of the ministries developing their administrative ICT driven information systems is growing. Those are mainly:

a. ministries managing information systems of the country: taxes, public finances, social insurance,
b. branch ministries organizing their own administrative information systems for realization of social and economic policy: education, health, some branches of the economy.

Other branch ministries and governments are using mainly the data collected by central statistics and by other ministries.

Local and central governments after getting the access to modern ICT, show the propensity to collect and process statistical data by them own, without the assistance of statistical offices and – unfortunately - without sufficient statistical expertise. That may lead to the disintegration of national statistical system and to the production of statistical data not obeying official statistical standards and quality criteria.

The Minstat should be given the mandate by the Inter-governmental Committee of State Statistics to control these processes by the mandatory coordination of production of statistical data within the frames of administrative information systems of governments. The tool of that coordination shall be the program of statistical surveys.

Important role in the dissemination of statistical knowledge in decentralized model of statistics will be played by the Research Institute of Statistics, cooperating with other scientific and education institutes.

5.4. Optimization of data sources an data collection

The long - term target of optimization of statistical data sources could be expresses by the slogan – "**statistics without questionnaires**".

This target shall be realized in practice in following ways:

1. CAPI and CATI for simple questionnaires
2. Intelligent electronic questionnaires delivered to the respondents
3. Collection of statistical data in electronic form via e-mail
4. Statistical portal for data collection
5. Use of administrative records for statistical purposes by selecting statistical data

6. Statistical data mining in administrative records of governments and enterprises
7. Optimizing the scope of collected data by reduction of redundancy by pre-integration of the sets of semantically and methodologically interrelated statistical surveys and questionnaires.

5.5. Integrated information resources of statistics

There is the need of developing the concept integrated system of data, metadata and paradata bases covering the whole national statistical system, both centralized statistics and statistical services of ministries. Common metadata and paradata base is the tool of integrity control and accessibility of statistical information resources.

All metadata and paradata resources should be store in one statistical metadata base (the architecture could be distributed) and should be accessible as the public good for all stakeholders. It should be defined the scope of statistical output data, that should be stored in public databases, and the data repositories accessible under respective conditions for specialized groups of users.

In modern ICT environment there are no technological constrains in archiving statistical data and metadata, including non aggregated data. Statistical archives should be capable to store all input data for unlimited period of time. The access to the non - aggregated data should be strictly controlled, and the access to identifiable data should be strictly forbidden and technologically impossible.

5.6. Dissemination of data and metadata

Active dissemination policy is the duty of official statistics as the contributor to the development of information society and knowledge based economy.

Up to now the approach of statistical services in Belarus to the dissemination of information was rather passive. Statistical offices are waiting for the users coming with the requests for data or buying statistical publications. The installation of internet and development of the websites of the Minstat and statistical offices has introduced new modern approach to dissemination of statistical products. However it is the beginning of long way.

The priority task of statistical offices is to transform the offices from data repositories passively waiting for the requests of users into the information centers actively offering information services to different groups of potential users. The following methods of active information policy should be considered and implemented:

- Active cooperation with mass media on all levels of the system (central, regional).
- Websites of statistical offices providing metadata and data as public goods.
- Personalized profiles of statistical data for special users (high level officials, experts, enterprises, researchers).

- End user friendly data retrieval form statistical data bases, enabling the navigation of users in the resources of official statistics, both centralized and decentralized.
- Dissemination of statistical knowledge for schools and universities on preferential basis.
- Access to the resources of international statistical systems *via* links on the websites of statistical offices (Minstat, regional offices, statistical websites of respective ministries)

In the dissemination policy there should be obeyed the principle of integrated dissemination of data together with all relevant and complete metadata necessary for proper interpretation and evaluation of data quality by end users.

6. Implementation priorities – the ISIS and transformation of methodology on the roadmap of the NSDS

6.1. The importance of the roadmap of the NSDS

In the PARIS21 recommendations the NSDS[12] the elaboration of the roadmap for the NSDS is of special importance for the success in modernizing the NSS. There is stressed, that it cannot be overemphasized that for the NSDS process to succeed, there has to be good forward planning for it. It is, therefore, critical that as part of the preliminary phase of the NSDS process, a "process roadmap" is designed, documented and agreed by key stakeholders. The process roadmap essentially outlines the organization of the work, identifies specific activities to be undertaken and the necessary resources to produce the strategy. It helps to answer a number of questions, namely:

(i) How do we deliver the strategy in an efficient manner?

- Who will be main actors?
- What are the timelines?
- How do we ensure the strategy is practical and will be implemented?
- What will be the mechanisms for political support, endorsement and reporting?

(ii) Do we as a country have the capacity and skills to undertake the task?

- If not, what assistance is needed?
- What form should this assistance take?
- What will be the source for such assistance?

(iii) How do we ensure that the strategy is relevant to national development objectives?

- How do we ensure that the strategy is country-owned?
- What type outputs will be produced and when?

In the PARIS21 recommendations it is stresses that participation and ownership are essential for successful strategic management and are the key to the success of strategy. It is essential that the process is also empowering with statistical personnel exposed to more effective ways of communicating with data users; international statistical standards, concepts and frameworks; and experiences especially about what is happening in other countries, particularly those in the same sub-region or region. The process should also broaden and deepen both intra-institutional and inter-institutional communication.

Finally, full advantage should be taken of the process to advocate for statistics especially among political leadership, decision-makers and development partners.

The roadmap should specify main steps that should be undertaken n the way from existing state of the art of the NSS into the direction determined by the target model. It is neces-

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sary to identify those undertaking that are laying on the critical path of the network of the roadmap to define implementation priorities.

6.2. Implementation priorities

The following "nodes" could be identified on the network of the roadmap of the implementing the NSDS for Belarus.

Legal and organizational frameworks

- **Harmonization of statistical law with e-government regulations and international standards**
- **Development of statistical infrastructure**

ICT

- Defining proper place and role of official statistics in the program *e-Belarus (Elektronnaya Belarus)*
- **Modernization of technological basis of official statistics (!!!)**
- Statistical intranet integrating all statistical units and services of the country
- ICT – driven methodology of questionnaire and input data design
- Statistical portal for data collection
- Implementation of standard format for statistical data interchange (GESMES – XML - SDMX)
- Implementing DBMS technology for processing and maintenance of statistical data (statistical database system covering respective data from central and branch statistics)
- ICT – based workstation of a statistician (*raboshee mesto statistika*).
- CAPI and CATI – computer assisted personal interviewing ("laptops for interviewers")
- **Common metadata base for the whole system of official statistics (central and branch statistics)**
- Implementing statistical database system: central, branch, regional
- Dissemination of statistical public data by internet (portal) and other forms of dissemination of information (CD), publication policy

Statistical frames and metadata

- **Statistical business register**
- **System of documentation** (*sistema dokumentooborota*)

- Continuation of the process of implementation of international methodological standards and their adoption to national needs
- TQM - total quality management of statistical processes

Advocacy actions

- Institutionalization of cooperation with governments both stakeholders of statistical processes and end users of statistical products (consulting of programming process, seminars, task forces and working groups),
- Cooperation and dialogue with respondents by institutionalization of contacts with different groups of stakeholders in the process of programming and realization of surveys and disseminating the outputs
- Communication with end users
- Monitoring of stakeholders' satisfaction (also via websites of statistical offices)
- Cooperation with mass media

Research and education

- Research works in statistical methods for specific statistical domains
- Research in statistical and information technology
- Education of statisticians, respondents and users
- Statistical products for schools and universities

The roadmap for the NSDS is the network of actions leading to the development of integrated statistical information system (ISIS) as one of basic segments of the information infrastructure of the country.

6.3. The milestones on the road and the prerequisites of the ISIS

The following implementations are the milestones on the critical path on the roadmap leading to the modern integrated statistical information systems (ISIS):

1. Central statistical metadata base
2. National statistical register
3. Statistical frames
4. Methodology of design of statistical questionnaires
5. Electronic intelligent questionnaires
6. Register of statistical questionnaires and input data

7. Optimization of statistical data collection
8. Use of administrative records for statistical purposes
9. Statistical databases system (non aggregated, low level aggregates, time series, regional)
10. Dissemination of statistical information

6.4. Common statistical metadata base

Standardization and integrity of statistical metadata are the determining the level of integration of statistical information system. Common metadata base is also useful tool of methodological coordination of surveys. That is why the development of common metadata base for the whole system of official statistics in Belarus, both for central and branch statistics should be one of the priorities of strategy of building the ISIS.

The development of the common statistical metadata covering the NSS as a whole base is a long lasting process, in some sense continuous activity, in which the Research institute and methodological and coordinating units of the Minstat should play leading role. The role of ICT in developing metadata base is necessary, but of auxiliary character.

The common metadata base should be developed parallel with the implementation of the use of specific metadata holdings in statistical practice, for design of statistical surveys and production of statistical output data with the help of metadata base tools.

It is not recommended to introduce to the pubic metadata base the metadata holdings that are not actively used by statisticians or by end – users. From theoretical point of view it seems to be good to store all metadata existing in statistics. However those metadata holdings that are not used actively by statisticians via the tools of metadata base are as a rule not updated carefully.

6.4.1. Functions of common statistical metadata base system

The metadata base system should realize following functions:

- storing, updating and disseminating updated metadata relevant to statistics,
- representing the links and relations between interrelated metadata (correspondence tables between semantically interlinked metadata),
- assisting statisticians to design the metadata layers of statistical questionnaires and statistical tables,
- determining and disseminating metadata standards for all statistical applications as well as for other relevant information systems.

The mistake that has been made in some projects of developing statistical metadata base systems was that the functions of metadata base were limited to storage and dissemination of metadata for interested stakeholders. It should be stresses that the function of *common meta-*

data – driven designing of surveys and producing of output tables was not the priority, and in practice was not implemented. In this situation the subject - mater and branch statisticians which should be responsible for updating metadata base, were personally not interested - as the specific stakeholders of statistics - in immediate updating of metadata and of proper maintenance of correspondence tables and interoperability between interrelated metadata holdings.

Therefore it is strongly recommended to develop the common metadata base step by step, introducing to the base only those holdings,

a) which are used for many surveys and

b) for which the immediate updating of any changes and interrelations (correspondence tables and other links between metadata items) could be guaranteed.

The consequence of this conclusion is, that for all stakeholders interested in using the metadata, there should be provided direct access on – line to respective layers of metadata base. The users should be provided with such facilities of access to metadata that they would not need any other sources of metadata (like publications on paper or their own autonomous versions stored and updated by them own.

6.4.2. The content of common metadata base

1) Basic standard international classifications and nomenclatures that are used in national statistical information system directly or indirectly, by all stakeholders of national statistical system.
2) National versions of international classifications and nomenclatures interrelated with relevant international classifications by respective correspondence tables.
3) Specific classifications and nomenclatures used in centralized and branch statistics. Special priority should be given to those classifications and nomenclatures that are used:
   (a) for classifying statistical units and respondents (e.g. for classifying businesses and organizations registered in statistical registers),
   (b) as the cross – sections in regularly produced statistical tables,
   (c) in two or more surveys, questionnaires or tables,
   (d) are relatively often updated, especially by the decisions independent on statistics (e.g. by external laws and administrative decisions),
   (e) form national accounts.
4) Terms, concepts and definitions used for statistical production and analyses. This metadata holding is very attractive for all external users and stakeholders. It could be implemented and updated independently on other metadata.

   The problem is that the statisticians (subject – matter statisticians), who are the only experts capable to elaborate these holdings, are not the end - users of it and are not interested in regular and immediate updating. Strong determination of top management, systematic control and strong coordination of maintenance and updating of metadata bases is needed to implement regular development and updating of the glossaries of terms and definitions.

6.4.3. Types of metadata holdings in statistical metadata base system

The following types of statistical metadata should be included into the common metadata base system

- Classifications, nomenclatures and typologies; priority should be given to those that are regularly used in many surveys or for production of many tables statistical tables,
- Terms, concepts and definitions used in statistics and in the systems of social and economic information interrelated with statistics (e.g. in administrative registers and primary administrative records that are the source of data for official statistics).

It is recommended to adopt SDMX standard (OECD and EUROSTAT) or other relevant standards recommended by international statistical organization for documenting the metadata, for elaboration and updating of correspondence tables and metadata interchange.

6.4.4. Minimal content of the prototype of common statistical metadata base system

The following minimal content of the prototyped version of common statistical metadata base is suggested:

(1) International standard classifications and their national versions (if are elaborated). E.g. CPA/CPC, ISIC/NACE, ISCO, COFOG, PRODCOM, HS/CN etc.

(2) International classifications used in the SNA/ESA and the system of national accounts implemented for Belarus (with detailed representation of all differences in semantics of specific items of classifications and nomenclatures)

(3) Classifications used for classifying statistical units in the national in statistical business register (see 3.2.), i.e. all classifications and specified in the methodology of central statistical register RESTAT (decision of the Minister of statistics and analyses of 28 January 1998), e.g. OKPO, OKOHX, COATO, COOY, OKFC, classification of legal forms, etc. and all relevant correspondence tables interlinking national classifications and codes with their international equivalents.

(4) Statistical classifications, nomenclatures and typologies managed by Minstat and used for administrative purposes by other ministries, especially by ministries of taxes, public finances, labour and social aid, social insurance, justice (court registers).

(5) Classifications, nomenclatures and typologies used by many surveys in centralized and branch statistics (important for coordinating function of common metadata base).

(6) Derived and secondary classifications and respective correspondence tables between primary, secondary and derived classifications.

For initial implementation it is proposed to use the description of classifications and nomenclatures and correspondence tables used in the Classifications and

correspondence tables stored in the metadata bases of EU, e.g. RAMON. (EUROSTAT metadata base containing 60 classifications and nomenclatures and respective correspondence tables). (See http:/eu.europa/comm./eurostat/ramon)

The methodologists of Minstat in cooperation with branch divisions are recommended to select the list of international standard classifications and nomenclatures relevant to Belarus statistics. It is recommended to select for initial implementation all those classifications and nomenclatures that have their Belarus equivalents.

All national classifications and nomenclatures should be transformed into the unified format. Unfortunately, in RAMON the classifications and nomenclatures are stored in their original formats. They are also not converted into one standard.

It is recommended to use the UN Statistical Division – Classification Registry standard for classifications and correspondence tables. It is simple, clear and contains all necessary items.

(7) Glossary of statistical terms, concepts and definitions. Because of usefulness of this metadata holding for statistics as well as for all other users and stakeholders of statistical system, it is suggested to establish special unit responsible for development and maintenance of the glossary. For prototyped implementation in could be the Research Institute of Official Statistics and for maintenance and updating – respective division responsible for methodological coordination of statistics.

It is recommended for initial implementation to use the standards and contents of the Concepts and Definitions Database CODED, developed and maintained by EUROSTAT (position 17 of RAMON metadata base). The CODED base contains about 300 concepts and definitions. It is proposed to select the concepts important for internal needs of Belarus statistics.

The standard format of the description of the concept should be extended. It should contain following items:

- term: Belarus version, English version (if necessary)
- synonymic terms (aliases),
- general definition: social or economic contents,
- sources of general definition: references to methodological,
- statistical definition (if necessary) : attributes measured, methods of statistical measurements,
- sources of statistical definition: references official statistical documents, laws and instructions,
- time: attribute of date of change of the term of its content, date of updating in the system,
- responsible unit: statistical unit responsible for the maintenance and updating of the term, contact person, contact addresses,
- links to related terms : lower, upper, associated,

- classification : classification of statistical subjects used in the program of official statistics or other systematic list of statistical subjects (e.g. list of key words in main statistical yearbook).

In the process of specifying the list of terms there should be identified and eliminated all homonyms. Homonymic terms should be replaced by pre-coordinated terms lexically different from other terms.

6.4.5. ICT requirements of statistical metadata base

ICT requirements for statistical metadata base are – in practice – negligible from the point of view of needs of regular statistical production. Metadata bases are relatively small, the frequency of updating is relatively low.

There are many software tools for managing statistical metadata. Some of them were elaborated within the research programs of official statistics of the ECE or EUROSTAT, and for official statistical agencies should be available on non – commercial basis. The review of existing software for managing statistical metadata could be found in the deliverables of the projects like: METAWARE, METANET, AMRADS realized within the EPROS program (Information Society Technologies - European Program of Research in Official Statistics) and in the deliverables of METIS project coordinated by UN ECE Statistical Division as the initiative of the Conference of European Statisticians.

After elaboration of the conceptual model and selection of standards for representation of specific metadata items and holdings, respective software for managing statistical metadata bases should be selected and implemented.

The metadata stored in common statistical metadata base should be disseminated as public information system accessible for all interested stakeholders. However it may be necessary to limit and control the access to the prototyped versions of specific layers or segments of common metadata base, before the updating of a given segment is not fully operational. Therefore in the initial phase of exploitation of the common metadata base the access limited to statistical intranet of the ISIS may be necessary (access for all statistical services and for selected authorized users). It seems that some period of time of limited accessibility to statistical metadata base is necessary, although it should be as short as possible.

6.4.6. Updating of the metadata base

Special attention should be paid to:

- methodology representation of links between classifications and maintenance of correspondence tables,
- control of updating the metadata base; any change of any classification should immediately generate the process of updating of a given classification and of all relevant correspondence tables.

It is strongly recommended to organize central unit responsible for coordination of maintenance and updating of metadata base, both the segment of classifications and nomenclatures, and the glossary of terms. The duties of this unit would be following:

- introducing basic primary statistical classifications and nomenclatures to the metadata base
- introducing administrative classifications interlinked with basic primary statistical classifications
- identifying person responsible for each primary, secondary and derived classifications in Minstat, in other statistical offices and in statistical services of other ministries,
- monitoring the changes of classifications and definitions of terms in statistics and in external information systems, with special reference to the changes in laws and administrative regulations outside official statistics (e.g. in tax systems, bookkeeping, government budget, administrative records of central and local governments, social insurance, social services etc.),
- maintenance of statistical glossary of terms in cooperation with subject matter statisticians and external experts.

6.5. National statistical register (PECTAT)

Central statistical business register and centrally managed statistical frames are the cores of integrated statistical information ISIS. According to the information received in Minstat, the centralized register of statistical units was established by the decision of the Minister of statistics and analyses in 1998 (Decision of 28th January 1998). However it is managed in decentralized way for individual surveys on the level of local and regional statistical offices. In practice there is no one central register, but a number of survey – driven registers integrated by common methodological principles and common metadata (classifications and codes).

The implementation of central statistical business register that could be used for all statistical surveys, that need identification and classification of businesses and other organizational units of the national economy and as the common statistical frame for all relevant surveys is the priority task for ISIS.

The register should be implemented in database technology. It should be accessible in intranet of the system of official statistics (for Minstat and statistical offices, for statistical services of other ministries and for local and regional governments).

Because of commercial value of data in central statistical business register and the need of the confidentiality of some data stored for statistical purposes, the access of other users to the register should be strictly controlled.

6.5.1. Definition and scope of registered units in statistical registers

The following models of statistical registers should be considered from the point of view of registered units

Model (1) Legal persons only

Model (2) Legal persons and organizational units that do not have the status of legal persons, but are identified as identifiable organizations

Model (3) Legal persons, other organizational units mentioned in (2) and organizational units classified as natural persons involved in economic or other activities, registered in other administrative registers of central or local governments (e.g. as employers, tax payers of VAT, establishments located in the regions other then the headquarter), that should be considered as statistical units and respondents equivalent to institutional units.

It is proposed to adopt the approach (3). In this approach the register shall cover all potential statistical units. This coverage is necessary for using the register as the statistical frame for sampling surveys of small and medium businesses (SME), for regional statistics and precise generalization of results. The variant (1) and (2) do not meet the expected needs of the statistical frame.

6.5.2. Procedures of registering and updating

Variant (1) Primary statistical register. Local statistical offices (rayon) are registering the units and are collecting the updates.

Variant (2) Secondary register based on other administrative registers. According to the information received in Minstat, there are four administrative registers, in which potential statistical units are registered:

- register of tax payers (covers all tax payers),
- register of social security service (all employers obliged to pay the social insurance for employed persons),
- registers of legal persons (court registers supervised by the Ministry of Justice),
- registers of units managed by local governments (rayon) covering both legal persons, establishments without legal personality and other units based in a given region (rayon).

It is proposed to analyze the details of the content of registers of tax payers and register of social security. It seems that the concatenation of those two registers may be good basis for organizing central statistical register.

In case of attributes needed for statistical purposes but not found in these two administrative registers (see: 26 attributes specified in the Annex 1 to the *Methodology of central statistical register* of 28 January 1998), it should be decided, what shall be the optimal way of collecting missing data:

(a) introducing the values of attributes from respective administrative registers (tax records, social insurance records, administrative registers of local governments)

(b) collecting missing metadata data directly from the units by local statistical offices (rayon or oblast),

(c) re-defining the list of attributes specified in Annex 1, adjusting them to the possibilities of administrative registers.

Experiences of all countries show that variant (2) is the approach providing better completeness and discipline of updating of registers however **only if all administrative registers used as the primary sources for the statistical register are storing the data on businesses covering minimal common denominator of attributes necessary for**

official statistics according to international standards. Autonomous statistical registers not based on administrative records of tax services, social security, courts etc. are expensive and – sooner or later – the managers are loosing the control on its updating and quality of information.

6.5.3. Need of extension of attributes of units for statistical purposes

The list of attributes of units is specified in Annex 1. However it is recommended to reconsider and revise the list of attributes and the procedures of their updating procedures. Some extension is needed from the point of view of using the register as the statistical frame, i.e. for driving samples and producing lists of reporting units. The statistical business register should be made also useful for administrative purposes.

The following extensions are proposed for consideration:

Mandatory extension:

- fax, e-mail address
- All kinds of activities by OKOHX should be specified (above the determined level – e.g. above 10 % of production, shipment or employment). Specification of one basic kind of activity is sufficient only for SNA, but for other surveys it would me needed to specify all kinds of activities that are not negligible from statistical or administrative point of view.
- Identifier of the business as the tax payer and social security payer. It is suggested to add the identifier of the unit in the social insurance system.
- The annual mean number of employees could be updated only for businesses covered by annual surveys. Small businesses, especially with the status of natural persons, may not be covered by surveys. It is recommended to analyze the updating the number of employees on the basis of social insurance records, in which all employers are registered.
- Dates of start and of closing the activity. It is proposed to add the dates of suspension and start of activity. For statistical purposes it is necessary to collect and to update the information on any break of activity, for monitoring the seasonality of economic activity. It is recommend collecting this information on the basis of tax records (date of the suspension of activity and date of the restart of activity as reported to the tax authorities). Therefore it is necessary to implement direct interchange of information between tax register and statistical register. The attributes of seasonality are essential for the function of statistical frame.

Practical possibilities of updating quantitative attributes should be guaranteed. It seems that the only way of updating of those attributes are statistical surveys. Those surveys may not cover all statistical subjects, especially small businesses and so called *microbusinesses*, which often have the status of natural persons.

Optional extension:

- Specification of the codes of all statistical surveys that the registered unit is obliged to provide to statistics (central and branch statistics). The updating of this set of attributes should be done by respective statistical services of the Minstat and other ministries.

As it was mentioned above, the statistical business register should be common for all statistical services of Minstat, of other ministries as well as available for some administrative purposes. That means that statistical registers of branches will not be needed as autonomous systems. The register should be accessible for all statistical services. Branch statisticians having direct access to the central data base of the register would be able to produce for operational needs, e.g. mailing list of questionnaires, list of units for electronic data collections via the statistical portal, catalogues of units for mircodata bases etc.

All updates of the values of attributes should be stores in the data base. Operational data base of the register should store the data for at least 10 years. After that period the data may be transferred to the archive of the register. The time of archiving the information should be unlimited.

6.5.4. ICT architecture of the central business register

Statistical business register is relatively small and is not very extensively used data base. The requirements for hardware and software

Client - server architecture:

- central database in Minstat,
- thin client on rayon level – updating and access,
- access of authorized statistical services via intranet.

The data base of PECTAT should be fully centralized. All operations of registering, updating, editing, archiving, are the operations of the central data base. Because of that the access on –line to the data base of the register should have all statistical services (Minstat, regional and local offices, statistical services of all ministries), responsible for:

- Registering the businesses
- Updating and editing the attributes
- Driving samples and lists of statistical units for all relevant surveys
- Developing and maintaining statistical mircodata bases
- Producing statistical tables and statistical aggregates, for which the classification of statistical units is necessary.

Direct access on line to the register should also have the services authorized by law to use the register for administrative purposes (excluding the attributes covered by statistical confidentiality, e.g. attributes 17, 18, and 19).

The above specification of users determines the ICT architecture of the statistical business register.

The PECTCAT does not need specific generalized software. It could be any database software providing the functionalities for maintenance, edits, updating and dissemination of relatively small database system. The generalized software used for the PECTAT business register should be coherent with other software packages. There are many software products on the market that may be useful for this purpose (the database software offered e.g. by SAS Institute, ORACLE, IBM, Microsoft, specific statistical packages developed by some national statistical offices like ISIS by Statistics Sweden). There is only one criterion of choosing the

software for the PECTAT - it should be the software that will be used for other statistical distributed database systems in Minstat, with good support and high long term credibility in Belarus.

6.5.5. The use of statistical register for economic demography statistics

Statistical business register is the basic source of information for analysis of organizational changes of the economy. It is good source of so called current economic demography, i.e. statistics of institutional changes of units of the economy, processes of concentration or distribution of economic activities by forms of property, legal forms of activity, regions and types of localities etc. On the basis of central business register, it will be possible to implement the statistical monitoring of the changes of institutional layer of the economy.

The prerequisite of the use of business register for economic demography monitoring is reliable updating of information in the register based on electronic data interchange (EDI) between the statistical register and respective administrative registers (taxes, social insurance, local governments records).

6.6. Integrated statistical frames

6.6.1. Statistical frames based of the central business register PECTAT

It is recommended to use the PECTAT as the "source frame" for strong frames for specific statistical surveys. This approach of developing strong frames on the basis of business registers is successfully implemented in many statistical offices advanced in the use of ICT.

"Strong frame" is the register – based of statistical units, in which are stored all attributes collected the business register plus additional data driven from administrative sources or other statistical surveys. These additional data should be stored and regularly updated. The scope of additional data should meet the following functionalities:

- driving samples and lists of reporting units for ALL statistical surveys,
- detailed classification of units by all criteria necessary for compiling statistical aggregates and producing statistical tables,
- re-classification of units necessary for updating and bringing to comparability statistical time series

Strong frames should contain the data on all levels of units: enterprise, establishment (if an enterprise is composed of many establishments), local unit (if not identical with establishment). The "vertical" interrelations between an enterprise, its establishments and local units should be represented in the metadata base of the strong frame.

In strong statistical frames based on business register for economic statistics the following additional quantitative attributes are usually included:

- employment (by upper level of kind of activity, by classes of employment)

- production (by upper levels of classifications of products – goods and services)
- statistical indicators adjusted to specificity of units characterizing the size of the unit and the scale of a given activity, e.g. for schools – number of pupils or students, for hospitals – number of beds, for social care units – number of inmates, for agricultural units – land used by kind of use, for housing cooperatives – number of flats and inhabitants etc.
- statistical indicators necessary for identification of statistical duties of units, e.g. for statistics of pollution – the attribute of polluting and kind of pollution (air, water, land etc.) received from environment protection administration, for

The updating of additional characteristics in strong frame should be based on statistical surveys or administrative records of respective government administration. If necessary, specific questions for updating the frame should be added to quarterly or annual surveys. Special attention should be paid to updating the frame on the basis of administrative data stored by specialized services (taxes, social insurance, local governments' registers)

6.6.2. Statistical area frames

In the long term program of development of integrated statistical information system the development of area frame for statistical survey should be envisaged. In the past area frames were used rather exceptionally before the wide spreading of modern ICT in the economy, government sector and official statistics. It seems that after upgrading of the ICT in official statistics and the progress of computerization of businesses and governments, the use of area frames for statistics shall be possible and may have strong impact on the efficiency of statistical activities and quality of output data.

On the basis of available information on the development of e-government we may expect that in Belarus shall be developed the computerized territorial register of land, starting from the level of lots and buildings. The primary information of all lots, real estate and other objects, shall be accessible for statistics. Official statistics in contact with national land register services should start the preparatory work of developing area frames.

The difference between existing territorial register is the lowest level of territorial unit identified and the scope of information on each unit. Existing territorial register used for driving samples and for compiling of data by regions, is representing administrative division of the country: region (*oblast*), county (*rayon*), locality (*selsovet*). The information on localities is limited to identification attributes, class of locality and some statistical attributes: population, space, selected economic data. In area frames based on computerized land registry the subdivision of land is 2 levels deeper. Basic identified unit is a *lot*, on upper level – *geodesic district*. The locality (*selsovet*) is set of geodesic districts. In geodesic registers and cadastres are collected qualitative and quantitative data on lots, located buildings and constructions, infrastructural objects, owners and users of land and located objects.

In the process of computerization of land registers and cadastres official statistics should take active part formulating proposals or elaborating classifications, codes, identification of subjects and objects and standard formats for representation of data. Use of metadata standards common or coherent with official statistics is the prerequisite of future use of those registers and cadastres both for statistical purposes and for administrative procedures.

Land registers and cadastres using metadata harmonized with official statistics are good frames for statistical survey in all areas of statistics, in which the phenomena and processes are related with territorial units, e.g.:

- Demographic processes on local levels
- Delimitation of local labour markets
- Agriculture
- Environment
- Housing
- Real estate statistics
- Technical infrastructure of national economy
- Regional diversification of social or economic phenomena and processes.

They are also necessary for developing geographic information systems (GIS) and regional statistical data bases.

The elaboration and maintenance of statistical area frames requires ICT equivalent to that needed for statistical business register and statistical frames based on that register under one condition - full interoperability between administrative land register and cadastres and the database system maintaining statistical area frames.

I would suggest the research on statistical area frame based on land register and cadastres. The objective of research project on statistical area frames based on administrative land registers and cadastres shall be the implementation of strong multi – purpose area frame for official statistics of Belarus. This area frame should support the constructing of specific area frames for specific surveys, e.g. statistics of forestry, environment pollution and protection, agriculture etc.

6.6.3. Current updating of frames based on censuses

In "pre-computerized period" national censuses (population, housing, agriculture, and industrial censuses) were the only available information base used as statistical frames for numerous areas of statistics. National censuses were conducted every 10 or 5 years. In the periods of dynamic changes of economic and social processes, the data collected in the censuses are becoming superannuated rather quickly. The current updating of censuses – based frames is necessary for proper accuracy and precision of statistical surveys, especially sample surveys.

The implementing of current updating of censuses – based frames could be achieved by:

- Storage of the census data (at least for last censuses of population, housing and agriculture) collecting census microdata in database technology. The Minstat should be equipped with mass storage capable to store all microdata from available censuses (data warehousing software for censuses and respective hardware);
- Implementation of statistical frames based on census data;
- Defining relations of reference between metadata and data of relevant administrative records and statistical frames (i.e. identifying administrative data that are the source

of updating of specific data in statistical frames and determining the procedure of updating);

- Development of correspondence tables between metadata in interrelated frames, in relevant administrative records and information systems;
- Establishing interoperability and electronic data interchange (EDI) between administrative population registries, migration records, statistical business register, administrative records of land, agriculture and housing, and the census data storage;
- Current, systematic updating (annual – as a rule) of statistical frames based on census data.

It is recommended to implement that approach to updating frames based on censuses for:

- Population and households (frames for household surveys, labour force surveys, other social surveys collecting data from individual and household);
- Agriculture (frames for agricultural sample surveys);
- Small and microbusinesses (strong frames for sample surveys driving very small samples).

6.7. Integrated design of ICT- based statistical questionnaires

6.7.1. Existing approach to the design of statistical questionnaires

The form of statistical questionnaires and forms used for collecting primary data is adjusted to traditional technology of data capturing and processing. We have in mind following characteristic features of questionnaires and forms:

1) The content of a statistical form is often representing the content of respective output table. It seems to be the relict of old data processing technology and editing: simple calculators and tabulators. That makes processing very simple – just adding the values in cells of a form.
2) Instructions for respondents are assuming relatively high level of statistical literacy of the staff responsible for completing statistical forms in reporting units. It seems that the level of statistical literacy may be overrated. It may be difficult for respondents to interpret the instructions in the categories of primary records of businesses and institutions.
3) Statistical units are obliged to compile statistical indicators on the basis of their primary records. However, statistical literacy of the staff responsible for filling out statistical forms in businesses may not be sufficient for proper compiling of the values of statistical indicators.
4) The structures of statistical forms and questionnaires are “individualized”. The only part of statistical questionnaire that is relatively homogenous is the identification and classification attributes of responding unit (name, address, basic classifications e.g. OKOHX, COATO, COOY, OKFC, etc.). The structuring of metadata (names of indi-

cators and classifications) is solved individually by experts responsible for each survey or for the set of interrelated surveys.

5) The numbering of sections, rows and columns of a questionnaire does not enable unique identification of statistical indicators in the system of official statistics as a whole. That is one of the reasons of rather deep autonomy of surveys, problems with integrity and comparability of data from different surveys.

The structure and form of questionnaires is that from the era of typewriters. The statisticians responsible for designing the questionnaires are using traditional approach and technologies. They are not equipped with modern ICT products, enabling computer assisted design of questionnaires.

New methodology of designing the questionnaires is the prerequisite of effective implementation of ICT. On the other hand, new methodology requires ICT on every statistical workstation both in statistical offices of Minstat, and in statistical services of other ministries and governments. Otherwise, in the existing state of the art, modern ICT would be used as faster abacus or better printer.

6.7.2. Need for new methodology of the design of data capturing tools and statistical questionnaires

It is recommended the elaboration of new methodology of design of data capturing tools and statistical questionnaires. New approach to designing statistical questionnaires should be based on following assumptions:

1) Unique identification of all elementary primary input data (indicators) in the whole system of official statistics, both, central and branch surveys, i.e. any primary value captured in any survey should be identified with the help of unique identifier.
2) Unique system of identification of metadata in the whole system of official statistics, i.e. any specific metadata holding - classification, nomenclature, typology, list of names of indicators, should be identified with the unique identifier.
3) Standard coding systems of classifications, nomenclatures and typologies on instance level,
4) Unique, unambiguous, explicit algorithmic relations between elementary indicators stored in questionnaires, e.g. Total value – as a sum of values of specified indicators, etc.
5) Standard terms, abbreviations and codes (numerical and verbal) of all modifiers and formal attributes of indicators (e.g. measurement units, type of prices, time, periodicity, currencies etc.) in the whole system of official statistics.
6) Standards for semantic structuring of a questionnaire:
   - Standard unique code of a questionnaire in the whole system of official statistics,
   - Standard types of sections of questionnaires: textual – identification of respondents and statistical units (paradata standards), numerical (GESMES), explanatory notes
   - Standard description of respondent: identifier, name, address, communication, responsible person

- Standard description of statistical unit (necessary, if different from the respondent): identifier, name, classification attributes
- Standards for formulation of names of indicators in questionnaires, with special reference to subdividing the names between names of sections, rows, columns, footnotes
- Standard representation of relations and links between elementary indicators in a questionnaire
- Standard representation of links with related questionnaires (e.g. central and branch statistics).
- Standard for instruction and methodological comments as an integral part of a questionnaires
- Standard for graphical forms of statistical questionnaires and their elements

The methodology of designing statistical questionnaires is based on the assumptions listed.

New methodology of the design of questionnaires should enable replacing the paper forms by electronic intelligent questionnaires.

The methodology should also take into account the requirements of the future common register of statistical questionnaires (and other forms of collection of statistical microdata) and the register of input microdata and its updating.

The Minister of Statistics and Analyses is authorized by law to introduce new methodology of design of questionnaires and all related standards for metadata and paradata, mandatory for all statistical services, both the Minstat and all other ministries and governments.

6.7.3. Process of elaboration of the methodology of designing statistical questionnaires

It is recommended to initiate the research project which objective and final results shall be following:

1) Analysis and adoption of best practices of in computer assisted designing of statistical questionnaires.
2) Elaboration of standards for structuring and representation of statistical metadata and data in statistical questionnaires adjusted to specific needs of Belarus statistics.
3) Implementing pilot metadata base of covering all standard elements used for the design of questionnaires (as specified in 3.4.2).
4) Selection and implementation of software (specific CAD for designing questionnaires).
5) Organizing the central laboratory for designing of statistical questionnaires for all system of official statistics (Minstat and ministries); the laboratory may be based or in the ICT division of Minstat or in the Research Institute of Official Statistics of Minstat. It shall be responsible for re-designing – step by step – of all questionnaires or supervising the implementation of standard methodology by those statistical services, that would like to re-design the questionnaires themselves.

6) Evaluating of questionnaires from the point of view of the methodology and adopted standards
7) Training of statisticians in new methodology and re-designing of questionnaires
8) Assisting in re-designing of questionnaires
9) Maintenance of the base of re-designed questionnaires (the initial, prototype version of the register of questionnaires and microdata).

6.7.4. Institutional frameworks of the methodology of statistical questionnaires

As it was mentioned above, new methodology of designing statistical questionnaires should specify:

- generic standards of representation of metadata
- specific standards for identification of microdata in the system of official statistics
- logical structures of questionnaires in electronic form
- specific standards for presenting statistical questionnaires in visual form (paper questionnaire should be treated as one of techniques of visualization of formats for data capturing)

All components of methodology need continuous research, updating, managing, dissemination and training. Because of that, it seems necessary to establish special units responsible for the development and maintenance methodology. It may be based in the Computing Centre of Minstat and shall cooperate with the Research Institute of Statistics

The elaborating of the prototyped version of methodology and standards is to large extent the research work that should be done by specialized research units, in the Research Institute of Statistics of the Minstat. The output of the research should be the: standards for metadata and paradata used in the designing of questionnaires, procedures of designing questionnaires, selection and adoption of software (CAD) for computer – assisted design of questionnaires, elaborate methodological papers, organize training for the experts in computing Centre and for statisticians. The research and training activities should be continued also after implementation of the methodology.

After the finalization of the phase of research, the duties of the responsibility maintenance and implementation of the methodology of surveys design could be taken by the Computing Centre of the Minstat. There shall be organized the “helpdesk” for subject matter statisticians responsible for statistical questionnaires to hep them to learn how to design questionnaires using new method and ICT assistance. In the phase of implementing new methodology pf surveys design the experts in this unit should redesign questionnaires in cooperation with subject - matter departments of Minstat and other ministries.

When the methodology of questionnaire design is verified and approved by the management it is time for introducing the program and detained schedule of stepwise re-designing of all questionnaires. This process should be coordinated with the implementation of the register of questionnaires and the register of input data (microdata).

The methodology of designing the questionnaires should be including also the requirements of electronic intelligent questionnaires.

There is rather rich offer of software packages that may be used for supporting the design of statistical questionnaires. The choice of standard software should be integrated with general software policy of Minstat.

6.7. Electronic intelligent questionnaires

Electronic intelligent questionnaires are the future of statistical data collection on questionnaires and forms. The idea of electronic intelligent questionnaires is based on the principle of integration of data capture and editing in one ICT – assisted process in one technological phase of statistical production process.

Electronic intelligent questionnaire is a program realizing following functions:

- structuring of metadata and data structure of the questionnaire in electronic form,
- visualization of the questionnaire
- computer assisted filling out of the questionnaire by respondent or interviewer, supported by metadata and pre – filled segments of a questionnaire
- real – time editing of the input data in the process of filling out the questionnaire (the questionnaire can not be "closed" before all errors are corrected)
- computer - assisted correction of identified errors,
- production of the files for electronic interchange – transfer of data to respective statistical database system (e.g. XML file for EDI to central database of microdata)

It is recommended after finalizing the upgrading of the ICT infrastructure to start the realization of the program of implementing the collection of statistical data using intelligent electronic questionnaires for selected pilot surveys. For pilot implementation we would like to recommend monthly surveys from businesses (legal persons), non – commercial institutions and governments.

There are following reasons, why it is recommended to start the implementing of intelligent questionnaires and EDI from monthly forms:

- Electronic collection of data on intelligent questionnaires is accelerating the process of data capture; therefore the effects, for both reporting units and statistical services, would be higher,
- Most of the units participating in monthly surveys are big businesses, well prepared - from technological point of view - to the cooperation with statistical services in EDI,
- Monthly questionnaires are relatively simple (e.g. comparing with annual surveys); the complete specification of all rules, algorithms, metadata support, pre – filling, computer assisted editing procedures, would be easier.

Two organizational options of implementing electronic intelligent questionnaires should be considered

1) The portal for electronic data collection on the server of Computing Centre of Minstat. Businesses (after login and certification) would have access to relevant questionnaires designed in the form of intelligent questionnaires. They shall fill out the

questionnaires in the portal. Filled questionnaires should be downloaded automatically to the file of input data. Reporting units will be authorized to copy the questionnaire to their own information system.

2) The intelligent questionnaires will be accessible for reporting units on the website of Minstat. The units obliged to participate in a given survey will be authorized to import the intelligent questionnaire to their own computer, then to fill it out and mail it back to respective statistical microdata base managed by the Computing Centre of the Minstat.

It seems that option (1) shall be more effective. Main advantage is that it enables full control of integrity of data capturing, dynamic reaction on the problems that may occur, especially when new questionnaires are introduced for the first time and the respondents may have some problems.

6.8. ICT - based statistical data collection

6.8.1. Approaches to statistical data collection

Collection of primary microdata is the most expensive and labour consuming phase of any statistical survey. The optimization of the costs and time of data collection for all stakeholders of statistical survey, minimization of the costs and time for statistical system as a whole, should be the priority objective of implementing ICT for statistical data capture.

The prerequisite of optimization of data collection is the implementation of new methodology of the design of statistical input data and statistical questionnaires and intelligent electronic questionnaires. This problem was discussed above (3.4. and 3.5.).

New problem that should be faced and solved by the Minstat is the optimization of data collection in modern ICT environment for centralized statistics and for statistical services of ministries, by respective redesigning of the surveys:

- minimizing the burdens of respondents,
- selecting optimal sources of input data, e.g. administrative records instead of primary data collection from respondents,
- pre-filling and personification of questionnaires,
- adjusting the organization of data collection to ICT architecture.

8.7.2. Minimizing the burdens of respondents

In case of existing system of statistical data collection in Belarus the minimizing of the burdens of respondents in modern ICT environment could be achieved by revision of the contents of statistical questionnaires. As it was mentioned above, existing statistical questionnaires contain statistical indicators. Each statistical unit is obliged to compute the values of indicators on the basis of their administrative records. It is labour consuming work. Besides,

statistical literacy of people involved in the filling out of questionnaires in businesses is often not sufficient for proper compiling of statistical microdata.

In modern ICT environment there is no problem for statisticians to compile statistical aggregates by them own, on the basis of data selected in most simple way from administrative records.

As it was mentioned above, we would recommend the elaborating and adopting by the Minstat the long – term program of analysis, evaluation and re-designing of all statistical questionnaires, both in central and branch statistics. This analysis should be realized jointly by subject – matter statisticians, methodologists responsible for coordination of statistical surveys and ICT experts from the Computing Centre. The prerequisite of realization of this program is the adoption of new methodology of the design of questionnaires and standards for representation of metadata stored in common metadata base of statistics.

For each survey (contents of questionnaires) statisticians should identify primary records or other information sources used by respondents for filling out questionnaires. After that there should be identified algorithms or other procedures for compiling or estimation of statistical indicators. On this basis the statisticians should propose the replacing of statistical indicators by simple aggregates driven from administrative records.

Direct effect of this approach is the reducing the burdens of respondents for calculation of statistical mirco - indicators on the basis of primary records, is important for statistical services - significantly reduces the number of errors. We should remember however, that in some areas of statistics and for some surveys the effects of this approach may be limited or not needed, because primary records are already coherent with statistical microdata.

8.7.3. Optimization of sources of input data

Next area of improving the efficiency of statistics using modern ICT is the optimization of the sources of input data. Traditional sources of primary microdata in statistics are statistical units: businesses, establishments, other organizational units, households, individual natural persons. Those units are primary sources of microdata. Collection of statistical microdata is based on primary data capturing directly from statistical units. In Belarus statistics (and in many other countries) this approach is still dominating.

The program of e-government in Belarus and the program of modernization of ICT infrastructure in Belarus statistics shall create new situation for data sources and data capturing in official statistics. Recently in Belarus all statistical units are registered in numerous administrative registers. Many of those registers are computerized and centralized (central database or distributed, centrally managed, database system). They collect systematically data from businesses and households for their administrative purposes. These data are useful for statistical purposes.

E.g. in administrative records of social insurance in Belarus there are collected detailed information on all employers and employment, except the shadow economy. The Ministry of Taxes is storing in their tax records of businesses the data on shipment and turnover, for all classes of gods and services. Tax records of natural persons contain data on all incomes (with the exception of non – registered economy) and on some expenditures (deduction from taxes). All those administrative records are regularly updated and verified. The level of computerization that was already achieved or shall be achieved soon makes possible the use of those data for statistical purposes. It should be analyzed carefully the possibility of replacing hundreds or

thousands of paper questionnaires to individual businesses and respondents by access to one computerized central database system of social insurance, tax authorities.

It is recommended to identify the interoperability criteria and to establish operational interoperability between ISIS and all administrative information systems and determine the standards for EDI (electronic data interchange). For the EDI of data in the form of statistical tables the GESMES or GESMEST/TS standards are good. It seems that almost all data and metadata in statistics could be represented in those standards. For transfer of GESEMS messages the XML or other standard language chosen for e-government could be used.

8.7.4. Personification and pre-filling of questionnaires

Important for optimizing the statistical data collection is the personification and pre – filling of questionnaires using statistical and administrative registers as well as historical data from statistical microdata bases. The personification and pr-filling should may adopted both for traditional and for electronic questionnaires. For electronic questionnaires the personification and pre-filling should be an integral element of conducting a survey.

The personification and pre-filling of questionnaires should be given high priority in the processes of improvement of survey design. The following measures should be undertaken to enable the personification and pre-filling of questionnaires:

1) Statisticians should determine the contents of statistical frames (statistical business register is also a frame) taking into account the needs of personification of identification and classification part of a questionnaire. It refers to the frames (registers) of organizational units, as well as to the frames for households and individuals (natural persons).
2) Special attention should be paid o the personification and pre-filling of questionnaires for microbusinesses and small farms operated by natural persons.
3) Important function of statistical microdatabases microdata (non aggregated data identifying individual statistical units) should be the function of pre-filling questionnaires with data that are not changing. Microdata bases should be also used for defining editing algorithm and procedures

In case of electronic data collection, all electronic questionnaires MUST be personalized and pre-filled as much as possible.

6.9. Use of computerized administrative records for statistical purposes

6.9.1. Direct data capturing from administrative records as most effective collection of microdata.

The development of e-government and computerization of businesses will create new opportunities of data collection for statistical purposes directly from administrative record of

governments and businesses. It is the most effective, quickest and cheapest form of collection of statistical microdata from the point of view of main stakeholders of official statistics: respondents and statisticians. It lowers dramatically the response burdens of statistical units, and reduces to the minimum the probability of errors in input data, saving time and costs of data editing by statisticians. Important effect of capturing the data from administrative records is the access of statisticians to the lower level that that of statistical questionnaires[13] ("microlevel").

The program of development of ICT infrastructure of official statistics and methodological works should foresee the requirements of the use of administrative record for statistical purposes. The ICT capacities of official statistics should be capable to use widely this form of data capturing.

According to the information received by the consultant, direct electronic data collection from administrative records of businesses is implemented in the banking systems of Belarus and is used by the National Bank of Belarus. All commercial banks are sending data in electronic form in standardized formats. It is recommended for official statisticians to analyze the experiences of the National Bank of Belarus, especially the organization and laws regulating the collection of data in electronic form, certification of messages, data security and confidentiality protection tools and methods.

In the future it should be foreseen the possibility of electronic collection of microdata from small businesses and microbusinesses *via* co called *intermediaries*, i.e. specialized firms offering accounting and other information services for these businesses, which do not want to maintain their own accounting services. Those firm are usually well equipped with ICT, are skilled in using advanced software and in EDI.

The outsourcing of accounting and information services by small and microbusinesses is common in ICT advanced economies. Nowadays in Belarus the outsourcing of accounting by the SME is rather limited, but is dynamically growing. May be a part of these services is not registered (shadow economy). The services are provided by accountants officially working in other firms, as non – registered part time job.

Although the intermediaries do not seem to be the source of data on small and microbusinesses on Belarus now, we should expect that in not very distant future this form of outsourcing will become also common in Belarus.

Therefore I would recommend watching the development of different forms of services for businesses Belarus, to initiate small research project preparing official statistics to use the intermediaries as the suppliers of microdata from small and microbusinesses.

6.9.2. Forms of direct data capturing from administrative records

The following typical situations of capturing microdata from administrative records should be specified:

1) Simple data capturing from centralized database systems of governments, e.g. tax system, social insurance, government budget.
2) Statistical data mining from centralized database systems of central governments.

[13] Microdata in statistical questionnaires are in fact the aggregates produced by reporting units on the basis of detailed administrative microdata stored in administrative records of businesses.

3) Simple data capturing from distributed administrative records of governments, e.g. administrative records of regional and local governments on local taxes, local budgets, local administrative register.
4) Statistical data mining from distributed administrative records of governments.
5) Simple statistical data capturing from administrative records of enterprises and other non – governmental legal units
6) Statistical data mining from administrative records of enterprises and other units

6.9.3. Strategy of implementation of capturing statistical mircodata from administrative records

In actual situation of computerization of Belarus economy the priority should be given to:

(1) – simple data capturing from tax records and social insurance records

(5) – simple data capturing from administrative records of the businesses that are on relatively high level of computerization of bookkeeping and of other management information systems.

The information systems (1) and (5) are ready to cooperate with statistics in that form. However one should check legal basis and identify the constrains that may limit direct access to administrative records. The statistical law of Belarus authorizes official statistics to access any records, under the condition of statistical confidentiality. However specific laws regulating administrative records may create some problems.

I would recommend the following approach. In the process of implementation of new methodology of questionnaire design the existing statistical questionnaires should be reviewed from the point of view of alternative sources of equivalent information, with special attention paid to the use of administrative records and systems that are today or will be tomorrow *ready to use* as the administrative source for direct collection of data.

I would also recommend organizing short seminar (1 day) on the use of administrative records for statistical purposes. This seminar should be attended by the staff involved in the design of methodological layer of surveys form Minstat and from ministries, and by the staff from regional statistical offices.

I would be recommended to create small expert group (ICT plus methodologists) responsible for coordination of test pilot implementations of capturing data from administrative records (1) and (5). On the basis of theses experiences the program of stepwise re-defining data sources, technology and organization of surveys shall be elaborated.

It seems that other forms of capturing the data from administrative records need research, elaboration of methodology and pilot testing of technology for selected, representative surveys.

First problem area of research is the use of data mining methods and software products for statistical purposes. The data mining is not very popular among statisticians. Researchers of the Institute may help to study the state of the art in statistical data mining, select approaches applicable for specific statistical surveys (e.g. statistics based on tax records and social insurance records, statistics collected from very big national enterprises like Belarus Railways, Belair, very large companies and financial sector of economy). The results of research should be tested on selected representative surveys.

Second problem area for research is the elaboration of methodology and algorithms of compiling statistical aggregates on the basis of microdata from the level of administrative records. Usually statisticians argue that they are not able to use administrative records as the source data because statistical categories do not correspond with detailed administrative data. However this explanation should be rejected, because it means that the staff in an enterprise is able to find the relations and algorithms of compiling statistical microdata on the basis of administrative records better then the statisticians themselves.

The objective of the research should be the elaboration of algorithms of compiling concrete statistical microindicators using microdata from the level of information management systems of businesses. Those algorithms should be stored in methodological layer of statistical metadata base.

6.10. Organization of data capturing in new ICT architecture

6.10.1. Forms and techniques of capturing data in new ICT architecture

Summarizing the above consideration, the followings the forms and techniques of data capturing in modern ICT environment could be introduced:

1) Personalized paper questionnaires: after implementing the statistical register and specific statistical frames for particular surveys in database technology it will be possible to personalize the questionnaires, also paper questionnaires. Main effect of this approach is the reduction of errors in identification and classification sections of the questionnaires. This approach shall be used for those respondents that are not able to fill in the questionnaires in electronic form. It seems that this approach will very quickly disappear - except some groups of households and some groups of mircobusinesses. Anyway in a transition period this form of data collection should be available for some groups of respondents.
2) Traditional questionnaires in electronic form: statistical offices supply the existing forms on the Minstat via the portal of electronic data collection. The effect: more convenient technique of filling out the questionnaires, zero costs of conversion of data from paper form to electronic file, significant reduction of errors (error - free questionnaires). It is suggested to implement that approach for "good" questionnaires i.e. for the questionnaires that should not be changed or improved.
3) Modified questionnaires in electronic form: after elaboration of new methodology of design of questionnaires, stepwise all statistical questionnaires will be re-designed.
4) Personalized and pre - filled electronic questionnaires submitted off - line by respondents: questionnaires imported by respondents from the portal of Minstat, then filled in off - line in their own computers and mailed to statistical offices via e-mail (ciphered – electronic signature needed).
5) Personalized and pre - filled electronic questionnaires filled in on - line by respondents: questionnaires available on the portal of Minstat, filled in by respondents directly in the buffer database of statistical microdatabase system.

6) Capturing of simple, elementary microdata from administrative records of governments or businesses (as in 3.1.7.), storing in statistical microdata base and then compiling statistical variables..

7) Statistical data mining from administrative records: (1) centralized database systems, (2) distributed administrative records of individual units.

I think, that the above sequence shows the complexity of implementing a given form and technique in practice in official statistics of Belarus – from most simple, ready – to - use now, to most complex approach for which some research is necessary and the pre-requisite is the progress in development of administrative records stored in database technology. It is suggested to include to the program of ISIS all forms of data capturing adjusting the resources for research, pilot implementations and operational implementations on practical effects that could be achieved within the program and on the progress in upgrading the ICT infrastructure on official statistics.

6.10.2. Impact of ICT based data collection of the organization of statistical offices

ICT based statistical data collection will have significant impact on the responsibilities, tasks and profile of skills of statisticians working in local (rayon) and regional (oblast) statistical offices.

Implementation of any form of computer assisted collection of primary statistical microdata is significantly reducing the duties of local (rayon) statistical offices. Now main duties of local statistical offices on the level of rayon are concentrated on the following activities:

- Identification of statistical respondents – this duty will be reduced after implementing central database of statistical register; it will remain only the duty of maintaining the samples of households. The identification of respondents will be done centrally in central statistical register and other centrally maintained statistical frames.
- Supplying questionnaires to respondents – this duty will also be reduced for all options of data collection. In option (1) personalized questionnaires could be mailed to respondents by mail. In all other forms (2) – (7) this function will disappear.
- collection of questionnaires from respondents – will remain only for option (1). In options (2) – (7) the data will be collected centrally.
- Conversion of data from paper to magnetic media – will remain only in option (1).
- Data editing (control and correction) - will remain only in option (1). Data editing in options (2) – (7) will be done centrally. If necessary some participation of regional (oblast) statistical offices, will be useful.
- Data processing – centralized for all options.
- Production of statistical tables – all production of tables based on the central microdata files will be centralized. Also the tables for local governments (rayons) will be produced centrally and disseminated to end users directly or – if necessary – via local statistical offices. Upgrading the level of ICT in local governments shall reduce the duties of local statistical offices.
- Dissemination of data and advanced information services for local governments and businesses – should be extended. Actually local offices have no time and capacity to

provide advanced information services for local governments. In the future local statistical offices may play the role of the centres of socio – economic information and analyses for local governments or its role may be reduced to local interviewing units.

- Household surveys – to be extended.
- Interviewing – to be extended.
- Organization of censuses and other mass surveys – without change, as a rule - once for decade.

Generally the duties of local statistical offices in the field of statistics collected form legal persons and other organizational units will be significantly reduced. Some of these duties will disappear (e.g. conversion of data from paper to computers, part of editing work), some shall be moved to the central level (editing, processing, producing tables and publications).

Total tasks of local governments will be significantly reduced. The estimation of saving and the analysis of all the consequences of the introduction of new ICT architecture in official statistics should be carefully analyzed (savings of labour costs, change of the number and quality of staff – analysts instead of questionnaire collectors, consequences of transferring of some duties to the centres).

6.11. Register of statistical questionnaires and register input data

6.11.1. Register of statistical questionnaires

One of the instruments of effective use of modern ICT in statistics for strengthening the capacity of official statistics is the computerized common register of statistical questionnaires. It is necessary to stress that electronic form used for extracting primary data from administrative records is also a questionnaire.

As it was stresses above, it is strongly recommended to elaborate new methodology of design of statistical questionnaires and equip it with respective CASE tools (computer assisted system engineering software for survey design and documentation). This methodology should contained standards for identification and representation of primary statistical indicators (microdata). This methodology should be mandatory for all official statistical surveys of Minstat and of other ministries and governments.

It was also recommended to establish central unit responsible for the re-designing of all statistical questionnaires. The re-designing of questionnaires should be computer assisted (special CAD software). The product of the re-designing (new statistical questionnaires in electronic form) shall be the input do the register of statistical questionnaires.

The contents of the register of the questionnaires will not differ very much from that what is stored in the existing website of Minstat, chapter “Methodology”, subchapters “Statistical instruments” and “Forms of official statistical observations”. The main difference is in standardization and structuring of all items of statistical questionnaires.

New methodology of design of statistical questionnaire should define standards for all items and sections:

- typology of statistical questionnaires (each type of questionnaire has it specific methodology of designing);
- standard broad classification of statistical surveys for all official statistics with unified formal codes (numerical with standard alphabetical equivalents) for all class and subclasses of areas of statistical surveys and analyses;
- standard of the identifier of a questionnaires (structure);
- centrally managed list of all identifiers of questionnaires (the identifier of the questionnaire should follow the standard mentioned above, it should be registered on the list managed by the units responsible for the register of questionnaires in Minstat);
- standard identification of the structure (sections, parts) of statistical questionnaire (types of sections and rules for structuring of each type of section);
    - identification and classification section of statistical units
    - sections for collecting numerical data
    - editing procedures and algorithms necessary for the respondent (addressed to concrete cells)
    - other explanatory notes (addresses precisely to respective parts of a questionnaire: sections or one section, groups of cells: rows, columns, cells etc.);
- references to statistical system
- references to official methodological papers and statistical regulations
- key words
- graphical form
- electronic form (XML message)
- references to other questionnaires (old versions, last version)

The standards for structuring of names of indicators should envisage the function of the register of indicators as the register of input data (see 3.9.2).

Conclusions:

1. The basis for implementing the register of statistical questionnaires is new methodology of designing statistical questionnaires.
2. The register should contain all statistical questionnaires, covering central and branch statistics.
3. One organizational unit in Minstat should be responsible both for the methodology of designing the questionnaires and for the implementation of the register of questionnaires.
4. Standard format of statistical questionnaires MUST provide unique identification of all values of mircodata (cells) in the whole ISIS (central and branch statistics).
5. The database software used for the register of questionnaires should have the facilities for representation and updating the descriptions of the questionnaires.
6. The register of questionnaires should be integrated with the module of the portal of electronic data collection.

7. New register of questionnaires will replace the information on the website (in doc format) when its contents fully covers the existing site (it will be a process).

6.11.2. Register of statistical input data

There are two approaches to constructing the register of input data (primary "microindicators" collected for statistical units:

- explicit approach – extracting microdata from statistical questionnaires, transforming their names in syntactically and semantically ordered form and storing in a statistical metadata base
- implicit approach – implementing the register of statistical primary microindicators as the functionality of the register of well structures statistical questionnaires.

The explicit approach is labour and time consuming. Subject matter statisticians are considering that as excessive work with the effect not justifying the efforts. Statistical offices, which decided to implement this approach, have –sooner or later – problems with updating.

Hoping that the Minstat will take the decision of developing new methodology of design of statistical questionnaires and implementing the register of questionnaires I would strongly recommend the implicit approach. It is reliable, updatable, cheaper and dopes not create hardly acceptable burdens on subject matter statisticians.

The functionality of the register of statistical indicators embedded in the register of questionnaires will need the development of special end – user interface (full text retrieval system).

6.12. Integrated system of statistical databases

6.12.1. Functions of statistical database system in the ISIS

The data, metadata and paradata under modern ICT environment should be stored in the structures and technology of database systems. The functions of statistical database systems are following:

- Storing statistical data integrated with relevant metadata and paradata
- Control of integrity of data from different sources and surveys in longer period of time; by the term integrity it should be understood:
    - completeness (of data, metadata and paradata),
    - comparability,
    - continuity,
    - precision
    - and other attributes of quality

- Access to data and respective metadata and paradata by all authorized stakeholders of statistical surveys, information retrieval
- Processing of data
- Producing of statistical tables for publications and other forms of dissemination

All these functions should be taken into account as the functionalities of statistical database systems. The critical function for any statistical database system is the function of integrity control. Sometimes it is the weakest point of database system. Mainly because subject - matter statistician consider statistical database as the job of I experts, while this functions could be properly realized only in close cooperation of subject - matter statisticians and IT people.

6.12.2. Types of statistical database systems

The following types of statistical database system should be considered for implementation in the ISIS:

- Microdata bases
- Micro – aggregate databases (low level aggregates)
- Time series database systems
- Regional and territorial database systems

6.12.3. Statistical microdata bases

Microdata bases (according to the name) are storing in the database structures the non aggregated data from the surveys.

Using the terminology of the famous Chen model of conceptual layer of database (ERA - entity, relationship, attribute)

- entity in such database system is a statistical unit (enterprise, farm, household etc.)
- attributes are microdata from questionnaires (structured according to the standards determined in the methodology of the design of statistical questionnaires
- relationships are usually represented by time, although it could be also other dimension, e.g. territory.

In practice there are adopted three approaches of microdata base systems:

A. Survey - driven microdatabase

– One microdata base is organized for each survey as separate database system. This type of databases in official statistics are recommended for well defined, relatively narrow surveys covering some area of statistics, e.g. foreign trade microdatabase collecting SAD documents, demographic microdatabase of births, microdatabase on death, on migrations etc.

B. Subject - driver microdatabase

- One microdatabase is created for the group of statistical units. In such data base are stored the microdata from a number of surveys, in which these units are taking part. E.g. Industrial enterprises, building and construction enterprises, agricultural farms, schools and educational institutes, shops (participating in data collection for price statistics), households (data from books of incomes and expenditures), etc.

C. Content – driven microdatabase

- Object microdatabase is storing microdata related with one domain of statistics, selected from different surveys on the basis of content of information e.g. labour market (non aggregated data on employment, unemployment, conditions of labour etc.). Such database systems are attractive for advanced users (analysis, economists). However because of subjective heterogeneity of those databases it is difficult do define proper subjective and survey delimitation of such databases. The databases

It is recommend to give in the ISIS the priority to:

(A) survey driven microdatabases

- foreign trade (exports and imports) based on custom declarations
- demography (birth, deaths, marriages and divorces, migrations)
- price in retail trade (collected in shops by interviewers)

(B) subjective microdatabases for economic statistics, household survey, statistics of public sector of the economy and consecutively other surveys, in which statistical units are the subjects registered in statistical register or other centrally managed frames .

The specification of concrete subject – driven microdatabases (B) is the issue of the decision of the management of Minstat.

Looking at the experience of some European countries and taking into account specific needs of Belarus governments (rather detailed and timely information on public sector of the economy), it seems that the following subject – driven data bases could be chosen for good beginning:

- industrial enterprises
- construction and building enterprises
- agricultural enterprises (state owned and cooperatives)
- transport enterprises (big companies)
- retail trade (big companies)
- households

For the time being I would not recommend develop the (C) content oriented microdata base. After implementing the (A) and (B) databases and collecting experiences on typical users requirements addresses to these database systems it will be possible to evaluate the needs for specific content oriented data bases on micro level.

6.12.4. Micro – aggregate databases

Micro – aggregate database systems are very useful type of databases. The idea of micro – aggregates, i.e. the low level aggregates is relatively new, but it has proven its usefulness in practice. The microdatabases are rather simple for statistical offices, but the use of those bases is usually complicated for end users, even for systematic, advances processional end - users. For this class of end users statistical aggregates published in standard statistical publications are not sufficient. They need more detailed data enabling them to compile the indicators and indexes by them own.

The micro –aggregates are detailed to much for their final use, interpretation of social or economic phenomena, but they are detailed enough for computation of upper level analytical aggregates of as input data to econometric models.

Good example of micro – aggregate database system is the database on foreign trade. The catalogue of entities is the classification of foreign trade commodities compatible with HS/CN nomenclature. The variables (attributes of entities) are: exports, imports / quantity and values, dimension – country and time (monthly periodicity). The sources of the data are microdata – custom declarations.

We would recommend to consider the following micro – aggregated database

- production by classification of commodities
- prices by classification of products
- population by localities and by main demographic and social attributes
- farming by localities, facet classification of farms, products
- households incomes and expenditures (aggregates for classes of households, sources of incomes, classification of expenditures for goods and services, localities).

The choice of priorities depends on the needs of main end – users. The monitoring of users needs is necessary for defining the priorities of development of this class of statistical databases.

6.12.5. Time series data bases

I would propose to implement one integrated database system of time series covering all areas of statistics. The initial list of time series could be elaborated on the basis of the content of annual statistical yearbook, main branch oriented statistical yearbooks and monthly bulletins. The length of time series should be unlimited. It seems that all main time series should be started in the year of independence of Belarus Republic

There are many software products for managing statistical time series. The choice of the software should be coherent with the general principles of software policy of Minstat.

Main problem of maintaining the time series data base is the control of integrity and comparability of time series. There should be two level administration of time series data base:

Level 1. The administrator of the whole database system responsible for maintaining and updating the metadata layer, control of updating the time series, control of integrity and bringing data to comparability, dissemination of information, archiving. This admin-

istrator could be based in the ICT department or in the section of management of statistical data bases (if such section is organized)

Level 2. The coordinators of particular subsets of time series. The time series stored in the database system should be subdivided into subsets on the basis of the contents of time series (subject – matter areas of statistics). The coordinators are responsible for the quality of time series, for methodology, monitoring of comparability, updating of time series, proposals of extending or deleting time series, changes of metadata, analysis of the needs of users of time series. The coordinators should be based in respective statistical departments.

The organization of the administration of time series data base as presented above is the prerequisite of success of the integrated time .

6.12.6. Regional and territorial database systems

It is recommended to consider the need of implementing the territorial statistical database system. Territorial statistical database system is not the set of statistical tables with the cross section by regions or localities managed with the help of database software. It is the specific object database system of statistical aggregates, in which objects are localities and regions.

The objective of territorial database system is to store the data on localities and regions of the administrative subdivision of the country. For Belarus it shall be 3 - level structure:

- *selsovet*
- *rayon*
- *oblast*

In the database system there should be stored statistical data on all administrative units, driven out from any surveys or other available data sources. The updating is – as a rule - annual, but some economic and social data should be updater quarterly or monthly (if possible and necessary) or seasonally, e.g. data on labour market (employment, unemployment), production, crops in agriculture etc.

The territorial database system should meet the requirements of local and regional governments. This information should be useful for budgeting procedures of local governments.

The feeding of the territorial database system should be automatic from statistical surveys or from subject – driven database system.

The territorial database system will be good basis for development of GIS.

We would recommend to analyze systematically the information needs of local and regional government to define the scope of data of the territorial database system. On this basis the initial contents of the territorial database system shall be determined. The territorial database system will be also the source of data for economic and social analyses realized on request of local governments by local statistical offices. Local statistical offices may use this database system in providing information services for local and regional governments and for commercial sector of the economy. The territorial database system is also very important source of data for regional planning, for scientific analyses and prognoses of development of regions.

The regional database system should be maintained and administrated centrally. The access to the database via database portal of the Minstat. Local governments shall access the database free. Commercial users could be charged for access to the data.

The territorial database system should be given relatively high priority. It shall strengthen the position of official statistics on local and regional level and extend the use of statistical information by local government officials and experts.

6.13. Dissemination of statistical information in ISIS

Main form of dissemination of information will be the portals of statistical offices, particularly the site of Minstat. The broadband internet is or will be soon common technology of communication between governments and organizational unit, as well as many households.

The consequence of expansion of dissemination of information via the portals will change the functions of statistical publications on paper. The role of the publications on paper (traditional yearbooks and bulletins) is dramatically decreasing. This process may be observed in Belarus. The users more and more often prefer the data on CD or they would like to access statistical databases on the sties of Minstat and other statistical offices.

The following steps of optimization of dissemination policy in modern ICT environment are foreseen:

(A) Traditional publication on paper, publication on CD as the option.

(B) Analytical short publication on paper, detailed tables on CD only

(C) Publication on CD only

(D) Dissemination via the website of the Minstat (implemented)

(E) Dissemination of output data via the access to database systems on portals of statistical offices (the problem of payment for the access should be solved)

The form of dissemination of information should be adjusted to the number and profile of users (central governments, local governments, education, research institutes, mass media.

Special attention should be paid to the special release of statistical information for mass media. Most of statistical data is delivered to the end users not from professional statistical publications, but from the mass media (TV, newspapers and journals)

In modern ICT environment the Minstat could (and should) issue special “statistical daily” for the use of journalists. It is something else then “Main socio – economic indicators of the Republic of Belarus” which is on the website of the Minstat. It should be extended statistical information “ready-to-use” by mass media, data with comments, explanatory notes, graphic presentation. It will help to avoid misunderstandings and will enable the Minstat to influence the quality of statistical information disseminated by mass media.

6.14. Statistical archives

Integral part of the ISI project should be the installation of mass storage for statistical archives. There is a rich choice of archiving devices on the market.

More difficult is the elaboration of the concept of archiving statistical data and metadata in modern ICT environment. Detailed conceptual schema of electronic statistical archives should be elaborated. On the basis of this schema the database system for management of archives should be implemented.

One should also analyze existing law on archiving and identify which statistical documents could be archived in electronic form only. If necessary, the proposal of changing the law on archiving statistical data and metadata should be proposed.

6.15. Integrated ICT architecture of official statistics

The ICT architecture for ISIS has proposed in his expertise Dr. Pham Tuan Phan, expert of the United nations (report from September 2004). The approaches to design the architecture presented in this report are still up to date and applicable for Belarus statistics.

Physical localization of hardware (servers, mass storage) shall be defined precisely after the decision on the role of regional statistical offices (oblstat) in the ISIS and the division of responsibilities between Minstat, regional statistical offices and statistical services of other ministries. I.e. how the implementation of ISIS in central statistics will influence on statistical activities of ministries.

The minimal requirements are:

- Access to intranet of official statistics from each workstation in Minstat and in any statistical office;
- Workstations for all statisticians working in Minstat, regional and local offices and in statistical services of ministries;
- Centrally managed statistical database systems and statistical metadata bases;
- Mass storage for statistical archives;
- Interoperability between administrative systems of governments and statistical ICT infrastructure

The recommendations of Dr. Pham Tuan Phan presented in his valuable report are good basis for defining what equipment and software should be chosen and purchased for realization of the ISIS in Belarus.

6.16. ICT - assisted coordination of official statistics

The ISIS as an integrated system of official statistics needs strong centralized coordination. One of projects realized within the ISIS is the computer assisted coordination of statistical activities. It should cover following areas:

1. System of programming of surveys covering central and branch statistics,

2. system assisting the scheduling, control and audit of realization of surveys and management of statistical resources used in the processes of realization of surveys and audit
3. system of coordination of methodological works and research, interlinked with the system assisting the programming of surveys
4. computer assisted budgeting of statistical activities (monitoring of drafting and realization of budgets)
5. management of the resources of official statistics (staff, ICT, infrastructure)

The computer assisted coordination systems should be administrated by respective departments of Minstat.

I think that all 5 areas of coordination should be included as integral elements of the ISIS project.

6.17. Impact of modern ICT environment on organization of statistical offices and services

6.17.1. Centralized vs. decentralized organization

The realization of ISIS will have direct impact on the organization of statistical offices and services.

The implementation of computer – assisted methodology of the design of questionnaires, new methods and technologies of statistical data collection and the processing, storage and dissemination of data based on integrated complex of statistical database systems implies the changes in tasks and responsibilities of statistical offices on central, regional and local level.

There is growing the number of tasks coordinated and realized in one centre for the whole country.

The duties that are dominating on the level of local statistical offices (rayon) shall be decreased. The participation of local offices in some surveys will not be needed.

On the basis of the schedule of implementing the ISIS the management will be able to optimize the redistribution of resources (staff, ICT equipment) between local, regional statistical offices and the central office.

For distribution of resources it is important for taking proper decision, what shall be the role of regional statistical offices (may be local) in central managing of surveys and central database systems. Looking on the experiences of European countries that had developed the network of regional statistical offices in the past, the distribution of central tasks occurs to be very effective. E.g. in some countries the central territorial database systems are managed by one regional statistical office, in the name of the central statistical office. Also specific database systems and surveys are managed in some countries by regional statistical offices.

On the basis of detailed analysis of the existing and expected capacities of regional statistical offices the management of Minstat will get the criteria for optimal redistribution of tasks within the ISIS.

One should also take into account new duties of local offices: providing advanced information services to local governments and commercial sphere, dissemination of statistical data for local users, especially education and research. Therefore statistical capacities needed especially on local level in urban areas should be carefully evaluated.

The redistribution of resources as the consequence of implementation of ISIS is a process. Building ICT infrastructure one should forecast the changes of tasks of particular local statistical offices.

Implementation of modern ICT leads to the centralization of managing statistical surveys: methodology, dissemination of questionnaires, collection of input data, editing, production of output data etc. All those tasks are realized with the help of centrally maintained metadata bases, registers and frames.

It is recommended to consider the following organizational theoretical variants of organization of managing statistical surveys in the system of centralized statistics:

6.17.2. Variant A. Full centralization of management of statistical surveys, data and metadata

The services managing the surveys based in the central office. On the level of local and regional units there are left the offices providing advanced analytical and information services for governments and organizing the network of interviewers and field operations. This model of "hyper-centralization" was implemented in some Scandinavian countries, Statistics Canada, Australia, New Zeeland. Similar model is in the Netherlands. In ranking of statistical offices those offices are considered as most effective.

The consequences:

transfer of duties and capacities (including the staff) from local and regional offices to the centre. Reduction of staff in local and regional offices. Functional transformation of local and regional statistical offices. Increase of the staff and capacity of the central unit in Minsk.

Conclusion:

this variant seems to be unrealistic in the reality of Belarus. It will need to increase dramatically the staff and the capacity of the central office. But more important is the loss of existing statistical capacity and knowledge in regional (oblast) statistical offices and in local units. High budgetary costs of transformation. Time needed for training and retraining staff in the central office. High costs of reduction of staff on local and regional level.

6.17.3. Variant B. Centralized distributed data collection on the level of regional statistical offices

Methodological works are - as a rule – concentrated on central level. Statistical metadata bases are managed centrally.

The management of particular survey is conducted from one central unit. It could be (a) the central office of Minstat in Minsk or (b) one regional statistical office managing the sur-

vey for all the country. That means that the frames, lists of respondents (on the basis of central registers) will be prepared for all the country in one place: in the Minstat headquarter or in one regional office which will be – in some sense – the unit of Minstat based in other city. This unit shall be responsible for all other activities: dissemination of electronic questionnaires, collection of information, monitoring of the data collection, editing (control and correction), processing, production of tables, maintenance of microdata bases storing the data from the surveys managed by a given regional statistical office.

It seems necessary to distribute to one regional statistical office the set of surveys from one domain of statistics (e.g. environment protection, agriculture, etc.).

In this variant there should be determined the specialization of regional statistical offices in some areas of statistics. In such regional statistical office there should be organized the group of methodologists specialized in a given area of statistics.

Consequences:

Distribution of tasks enables to use the capacity of regional statistical offices. The domains of statistics strictly interrelated with other ministries and with special interest of central government should not be distributed from Minsk. It may not be easy to distribute the managing of surveys equivalently to all regional offices. The distribution is a process, not one – day - action. It needs the creating of methodological and technological capacity in regional statistical offices. This variant means the strengthening of regional offices by moving some resources from local offices (rayon) to regions (oblstat).

Conclusion:

This variant seems to be realistic. It enables to make use of the statistical capacity in regions, not overburden the headquarter. It also minimizes budgetary and social costs of transformation of statistical data collection. It will also create computing capacity in regions, important for censuses and other large statistical surveys conducted irregularly.

For making final decision on the variant and its concretization, it is recommended to elaborate the SWOT analysis of positives, negatives, costs and benefits of the variants in short, middle and long term. And evaluation of possibilities of distribution of methodological works and managing surveys to regional statistical offices.

6.18. Methodology and surveys design and their place on the critical path of the roadmap

6.18.1. Target goals of methodological development of the NSS

The following target goals are determining the priorities in the field of statistical methodology and production of information:

- Coherence and interoperability of the Belarus NSS with global statistical system: implementation of international methodological standards for all those areas of statistics, which are coordinated on global level by UNSC and international statistical organizations.

- Coherence of statistical methodology with specific national information requirements articulated in national laws and other regulations of economic and social life, as well as with concrete needs of governments, businesses, researchers and education on national and local level.
- In case of differences between international standards and national requirements the NSS should be capable to produce parallel the versions of statistical data

  (a) meeting both the international and

  (b) national standards,

  and providing two versions of metadata necessary for identification of methodological differences between those approaches necessary for proper interpretation and use of information elaborated in different methodologies.
- The glossary of concepts and definitions and correspondence tables between international and national classifications covering both international and national standards is the necessary tool for control of coherence.
- The NSS in Belarus, according to the Law, is obliged to fulfil several functions of administrative information system for the governments and for state – owned enterprises; mainly those administrative functions are realized by statistical services of governments. It is expected that the non – statistical functions of the NSS will be successively reduced along with the transition from existing model of *planned market driven economy* (*planovo – rynotshnaya ekonomika*) to more market - driven open economy, as well as with the development of e-government and private sector in the national economy.
- It is necessary to distinguish those administrative functions and questionnaires from statistical ones both in legal regulation and in statistical practice. Collection and processing of data for administrative purposes realized with the help of statistical structures should be clearly distinguished from statistical processes and should be realized not on the basis of general statistical laws, but on the basis of other administrative regulations. All respondents should be aware of that and should be explicitly informed in what type of information processes they are participating: statistical surveys or administrative systems.
- Implementation of new methods in statistics should envisage and use the possibilities of access to new information sources created by the national program Electronic Belarus and the progress in the development of information society and knowledge based economy. The NSS and Minstat as its the coordinating organ are authorized -within the frames of existing laws - to initiate the computerization of administrative information systems extending the use of administrative records for statistical purposes.

The most important methodological works and the implementation if their results that should be envisaged on the roadmap of development of the NSDS, are listed below[14].

6.18.2. National accounts

[14] The analysis of the current situation in particular statistical domains was presented in Korns A., op. cit. pp. 27 – 38.

The strategic objective defined in the *Program of Development State Statistics in the Republic of Belarus for 2006 – 2010* is to finalize full implementation of the SNA following the SNA 93 / ESA 95 methodology around 2010.

Work on the system of national accounts (SNA), based on UN methodology, started in 1993. The accounts are prepared for economic activities, expenditures, and incomes by source and use. Quarterly GDP was first released in January 1996 and is now available for 1992-2005. Now, In conformity with SDDS, the Minstat releases quarterly national accounts data 90 days after the close of the quarter.

However the SNA system needs further methodological works to improve its completeness, quality and timeliness of data produced. The following areas of the SNA need strengthening the methodological and productive capacity of the Minstat and cooperating offices, mainly the National Bank of Belarus and the Ministry of Finances:

- Implementing full schema of the NSA on national level (sectoral accounts, capital formation, input -output tables),
- Quarterly accounts – methodological improvements, implementing bottom – up approach,
- Regional accounts on the level of regions (oblast), annual and quarterly (basic schemas)
- Non – registered and non – observable economy
    1. Informal-sector production;
    2. Illegal production;
    3. The underground economy, consisting of activities that are deliberately hidden from observation for reasons such as tax evasion;
    4. Household production for own final use; and
    5. Production missed due to deficiencies in data collection programs, such as frame deficiencies, and non - response or underreporting by enterprises.

In the context of SNA93, there has been a heightened international focus on the inclusion of the "non – observed economy" in GDP estimates, in order to achieve in national accounts the full coverage of the national economy. The standard manual on this topic, published in 2002 by the Organization for Economic Cooperation and Development (OECD), lists five kinds of activity that should be covered[15]:

While there is considerable overlap among these five concepts listed above, each requires separate attention to ensure that it is covered properly with no duplication. At the Minstat, the non-observed economy is estimated only for one concept - the production of informal – sector of the economy.

The *Program … for 2006-10 is* itemizing major steps in developing the SNA, namely:

[15] *Measuring the Nonobserved Economy: A Handbook*, OECD, 2002. The handbook was prepared by a team including OECD, the IMF, the ILO and the Statistical Committee of the CIS. Another useful document is *The Nonobserved Economy in National Accounts: Survey of National Practices, Economic Commission for Europe*, 2003.

- Improvement of the estimates for the non - observed economy. Special surveys would be needed in support of such improved estimates. The surveys would involve statistics for agriculture, construction and services, as well as a special survey of affluent households.
- Improvement of the estimates of GDP by expenditures in current and constant prices in order to minimize fluctuations in the statistical discrepancy. Special focus is needed for net exports, especially in constant prices (in view of the current lack of a separate deflator for services).
- Strengthening constant-price GDP estimates for production, especially for construction. This may involve either new data collection by the Minstat, or a review of the methods used to collect data by Republican Scientific and Technical Center for Pricing in Construction.
- Converting GDP estimation to ISIC (OKED implementation during 2006-10.
- Implementation of imputation methods of non – directly observed components of GDP (e.g. imputed rents etc.).
- Improve documentation of metadata, particularly for sources and methods.

The non - observed economy and the regional accounts are the most complex of the issues mentioned above. It will require coordinated innovations in numerous surveys in economic statistics and in household surveys.

6.18.3. Price statistics

The price statistics is following (CPI, PPI) is following international standards. The surveys are systematically conducted from the beginning of the 90$^{th.}$ Statistical investigations and calculations under the International Comparison Program of 1993, 1996, 1999-2000 and 2004-05 helped calculate the Purchasing Power Parity (PPP) of the Belarusian ruble.

The preparation of regional and national price indicators is carried out at the Minstat using its own software package. Seasonal adjustment is not carried out. Based on a random sample, consumer prices are collected for 31 cities and towns, including Minsk, the six oblast centers, and four rayon towns within each oblast. Sample surveys cover at least 4385 outlets for 395 products and services.

Producer prices are collected only for industry, at 1400 outlets for more than 4500 industrial goods and not for agriculture goods or construction materials, which are collected elsewhere. The changes of quality issues, such as the changing quality of high technology products, are nor included in the methodology. The quality adjustment is the problem the should be included to methodological works, adopting the experiences of other countries (e.g. EU).

The documentation of methodology and metadata (survey sources, such as the response rates, survey monitoring, non-sampling errors, sample frame, sample design, estimation, and imputation techniques) should be standardized and made available for users.

The following actions are planned for 2006-10 in the price statistics:

- Study adjustment methods for quality changes and begun to make such adjustments for consumer and producer prices.
- Begin collecting producer price statistics for other branches of the economy that are not yet covered by the PPI, such as business services. Such an expansion is foreseen in the context of the shift to ISIC (OKED).
- The transition to a product classification consistent with ISIC.
- Introduction into the CPI of purchases and maintenance of motor cars, as these now play a much larger role in consumer spending than they did when the CPI was started. This will also require coverage for second-hand cars.
- Correct for seasonal fluctuations in prices and volumes of certain goods.
- Include the case of subletting for apartment rents.
- Collect price data in support of the estimation (by the Department of National Accounts) of imputed rents on owner-occupied buildings.

6.18.4. Statistics on foreign trade

The Minstat calculates monthly unit-price indices based on the quotient of value and quantity data for more than 5000 items and uses these to prepare constant-price measures of imports and exports. The process of calculating unit prices is in part a work of art. Although the purpose is to estimate a pure price change, unit prices are sometimes sharply affected by mix change. The customs category is usually rather broad – for example, cars weighing more than x kilograms. Such a category would obviously contain a mix of models and the mix could easily change, for example, a shift toward a luxury cars. It is difficult to control for such changes, but certain techniques have evolved for at least filtering out the most abrupt such ones – i.e., those that exceed a certain threshold rate of change.

The Minstat is concerned about the challenge of converting to a new HS system, in preparation by an international agency at this time. The problem will be how for Belarus to build a bridge between the new data and existing time series

Twice a year the Minstat sends full data to the UN COMTRADE. The Minstat has received occasional methodological assistance from COMTRADE. Methods are regularly discussed with the Statistical Committee of CIS and with Eurostat. Data on trade in services are limited to purchases by registered enterprises and agencies. The department has annual data on the major part of foreign direct investment. The data covers nearly 400 Belarusian enterprises.

The tasks envisaged in the Program for 2006-10 include:

- Building a new correspondence table for converting from the new HS system that is being prepared to the current one, HS2002.
- Collecting improved data for trade in services, particularly by means of surveys of travelers similar to those conducted in Poland and Russia and planned in Ukraine.
- Begin working on prices for trade in services.
- Refining methods used in calculating unit prices, to minimize the role of mix changes. Technical assistance could help with this problem.

- More communication with other countries, especially neighboring ones, by means of study tours, seminars, and visits by consultants.

6.18.5. Household statistics

The household surveys n Belarus statistics, developed with the help of foreign experts, are on high methodological level and meet international standards. To provide data for monitoring poverty and other social problems, the Minstat began in 1995 a sample survey at 6000 households, with full sample replacement each year. The sample provides data that is valid at the oblast level. The data are annual, based on quarterly interviews with each household.

The price statistics was leading in the application of IT to problem solving. For data entry (at the oblast level), a special program provided by the World Bank and customized for Belarus is used, microdata are stored in Access database, and the SPSS is used for the analysis of and compilation of output data. Micro datasets are available for sale to researchers.

The household survey, in addition to providing a profile of households with low expenditures and incomes, also serves another key function: national accounts, price statistics, some estimates of non – observable economy.

A common problem in many countries is the special difficulty of covering affluent households. This is the main reason that consumption covered by the household survey has been estimated to cover only about 55 percent of Personal Consumption Expenditures, leaving 45 percent that must be estimated by indirect methods.

Tasks in the field of price statistics for 2006-10:

- Review the poverty line used for analyzing the data, especially looking at non - monetary indicators and dimensions of poverty (such as access to basic services in rural areas);
- Improved validation and imputation methods;
- Improved coverage of the sample, at least by periodical occasional special sample survey for affluent households, using special enumerators and methods, in an attempt to gain their trust and obtain reliable data,
- Review the weights and sampling methods;
- Upgrade the publication with use of a desktop publisher program;
- Retrain all interviewers;
- Carry out a special pilot study of affluent households; and
- Purchase new, LAN-capable, version of SPSS
- Equip interviewers in the hardware and software for CAPI and CATI
- Experimental implementation of CASI and internet interviewing.

6.18.6. Labour force statistics

The existing system of labour statistics at the Minstat is built entirely on data from employers. The main components are obligatory reports in the formal sector (state agencies and registered enterprises), for both employment and wages. Employment data are broken down by branch, oblast, sex, age and educational attainment. The data on unemployment are based on administrative unemployment register and seem to be heavily biased.

The basic task in the field of labor statistics for the period coming (2006-10) is o launch a household survey of labor force behavior on the basis of large sample covering regions up to the level of rayons (if possible). The size of the sample should enable to estimate the real economic activity level of population by regions (equivalent to NUTS 3), social groups, education, and sex. It shall supply data for the estimations of:

- unemployment rate (based on the ILO concept);
- employment in the informal sector;
- non – registered incomes of individuals and businesses, mainly of small and micro - businesses and individual farms.

Special attention should be paid to the surveys of school leavers and their absorption by the labor market, labor markets – driven migrations (internal and international), gaps between education of employees and effectively used skills, the long - term structural unemployment and geographic distribution of employment and unemployment in the country (map of labor markets as the part of statistical GIS).

6.18.7. Demographic statistics

Demographic statistics in Belarus is on high level. Vital statistics meets all international recommendations. Population and housing censuses are conducted regularly and follow the UN guidelines. As in many countries, there are the problems with migration statistics, partly because of the incompleteness of data for migration to and from Russia, due to the lack of passport control at the frontier and to the reluctance of citizens to register their movements with the authorities.

Following the UN recommendations, the Minstat has begun preparations for the 2009 census. After reviewing the experience of other countries, the Minstat has decided not to use scanning and optical-character-recognition technology for data entry. Instead, it will rely on manual data entry.

The 2009 population and housing census should be one of the most important milestones in implementing the NSDS and creating modern ICT and regional infrastructure for the whole NSS of Belarus. Integrating the resources of donors supporting the implementation of the NSDS and internal resources of the governments for the 2009 census, the Minstat may introduce deep qualitative transformation of the system, i.a.:

- Strengthening the capacity and modernizing the network of interviewers (they may be used as trainers and supervisors for the census), providing them with modern data capturing technology.
- Modernizing the ICT infrastructure: installing modern workstations for all employees that need the access to ICT in statistical offices and implementing statistical intranet for data interchange; majority of those workstations and intranet will be used in the 2009 census for manual data entry, and after that will become the basis for integrated ICT infrastructure used for all other statistical processes.

- Modernization of the organization and technology of mass storage of data (archiving of microdata in data warehouses)
- Upgrading the technology for census mapping, by using satellite receivers (Global Positioning System (GPS) type) to record features and boundaries, and Geographic Information System (GIS) applications to organize and present the data.
- Upgrading the technology of printing (i.a. printing census questionnaires), publishing and for ICT driven data dissemination (CD's as a standard).
- Implementing pilot versions of regional database systems and problem – oriented database on demography and housing (low level aggregates); consecutive updating of the data base using the information from current population surveys and administrative records on housing, real estate and registration of population.

6.18.9. Industrial statistics

The system of industrial statistics in Belarus is based on the reports from registered businesses. The Minstat compiles monthly production statistics for industry and prepares a monthly index of industrial production (IIP). Large establishments are covered by compulsory forms, while smaller ones are covered by a sample survey. There are also collected annual production data that are more complete than the monthly data.

The methodology for the monthly production index, based on 560 goods, was revised sharply at the beginning of 2006, on the basis of advice from the IMF. The previous method, in which weights were based on current prices, was biased, especially in periods of rapid inflation. In the course of the transition two problems require attention: how to adjust for quality improvements of products, and how to create consistent time series based on the new methodology[16].

The following methodological problems are envisaged in the Program of development of state statistics for 2006-10:

- Implementing ISIC-based committee classification and recompiling basic retrospective tile series (retrospection - if possible - from 1995, minimum from 2000)
- Seasonal adjusting of monthly data;
- Methodology for adjusting for quality change,
- Methodology for using annual data and the PPI to prepare a more reliable constant-price annual measure of production by industrial branch, and then using the latter to benchmark its monthly index;
- Recompiling (retrospective data) the time series of the IIP by branch for the period from 1995 (minimal period from 2000) in a way that is consistent with the new methodology;
- Verification of sampling and methodology of data collection from small enterprises

[16] Interesting methodological proposals concerning the IIP are contained in the report of A. Korns, op.cit. p. 34 – 35.

- Identification of non – registered industrial production and elaboration of methodology of estimation for groups of products which the non – observed industrial activity is of importance on the level of branch or region.
- Implementing CASI and internet data collections.

8.18.10. Construction and investments statistics

Registered construction is fully covered by official statistics and by administrative registers (monthly reports). Reports are sent by all registered producers and investors. Monthly reports are used to prepare a current-price measure of construction activity, which is then deflated to a constant-price measure using a price index (in cooperation between Minstat and the Republican Scientific and Technical Center for Pricing in Construction, by the Ministry of Construction and Architecture).

However some part of construction services may be not fully registered (underreporting). To clarify the situation, a pilot study of missed construction in a small area needs to be carried during the period 2006-10. This would serve as the basis for a clear decision on whether to invest effort in routinely measuring informal activity in construction. The development of the register territorial register planned within the program *Electronic Belarus* may change qualitatively the approach to the construction statistics. Active participation of Minstat in methodological works of this register should enable future use of this register for statistical purposes, improving the quality of data and reducing the response burdens.

6.18.11. Domestic trade statistics

In view of the transition to a market economy, the forms and instructions used for collecting data on domestic trade have been adapted to the new situation. Four main methods of observation of retail trade are used:

- Monthly obligatory reporting on sales by 12,000 shops in the statistical registry;
- Quarterly obligatory reporting by shops in a special registry of 6000 shops in fixed locations that are not in the statistical registry.
- Quarterly obligatory reports on retail margins at about 6,000 establishments from the statistical registry.
- A quarterly sample survey on sales for about 10,000 owners of market stalls and other small retail outlets, to learn of their sales[17].

The household survey of expenditures are used to estimate the value of retail sales that were not covered by the obligatory reports, but beginning in 2007, the department expects to use the sample survey (third source) to cover that data gap.

The strengthening of the capacity should be oriented on the development of strong frame enabling to drive relatively small samples of medium and small retail trade companies and extending the information collected in household surveys on the expenditures of households for goods and services, to fill in the gap between reported turnover of shops and the demand on the market.

[17] This survey was introduced in February of 2006. It is based on a list, compiled by the tax authorities, of 123,000 vendors in retail trade and catering, who are not in the statistical register.

6.18.12. Agriculture statistics

The system of agricultural statistics in Belarus is based on the reports from three sources:

1. Legal entities in agriculture (agribusiness) must submit obligatory forms on production for plant growing and livestock.
2. Agricultural activity undertaken in individual subsidiary plots is covered by annual estimates reported by about 1500 local councils (soviets), which base their estimates in turn on household record books.
3. The output of agricultural activity undertaken by households that are not subsidiary plots is estimated based on data from household surveys

The sources (2) and (3) seem not to reliable enough in this phase of transition of the economy and their reliability will be decreasing. In the Program … for 2006 – 2010 there is not envisaged the conducting of agricultural census in Belarus around 2010 (recommendation of the UN and FAO).

The actions that should be included into the program of development opf statistics Tasks for the next five years include:

- Design and implement the agricultural statistical register (frame) for driving samples covering the farms that are not registered as legal entities.
- On the basis of this frame implement a sample survey of household agricultural activities. This would provide more reliable estimates for farms (2) and (3).
- Active participating and use administrative registers of agricultural markets for statistics of market production of agriculture.
- Improve the methodology of monitoring of prices in agriculture.
- Implement the statistics of costs of agricultural production and its economic effectiveness.
- Implement OKED, while preserving parallel data flows for a transition period, to support the maintenance of time series.
- Develop the program of statistics monitoring the rural areas and economic activities related with agriculture.

6.18.13. Statistics on transportation, communication and services.

The actions of development of statistics on transportation, communication and services planned in the Program … for 2006 – 2010 cover most important tasks to improving statistics of the side of supply of those goods and services. There are however following issues that would need consideration by methodologists and producers of statistics:

a) Transportation

- Improving frames for identifying kind – of – activity units in transportation for driving samples

- Improvement of quality of data from small and microbusinsses on the basis of sample surveys
- Methods of estimation of non – registered (shadow – economy) transportation services on the basis of indirect data and household surveys
- Elaboration of the approach to measuring transportation services in agriculture (small farms and households)

b) Communication

- It is proposed to include to the program the measuring of development of information society following the proposals of the UNCTAD group on measuring information and communication technologies, adopting the proposed list of indicators to the national conditions of Belarus

c) Services

- Improving of the coverage of non–observed economy for services, as the alternative source to the data from the household survey; labor force survey based on large sample may help to enlighten this sphere of economic activity.
- Implementing the OKED classification to the collection of statistics for services.
- Realize the actions proposed in the Program … for 2006 – 2010 on statistics of services for businesses (advertisement, accounting, etc.).
- Develop methods of statistics of services in the field of real estate management with special reference to private real estate market and housing.

6.18.15. Other fields of statistics

The NSDS roadmap shows the directions of strengthening the capacity for other areas of official statistics. In this report we have concentrated the attention on those wields that seem to be on the critical path. It does not mean however that the importance of development of capacities and modernization of other fields of statistics may be underrated. The roadmap shows the direction and priorities. The Program of development of the state statistics of the Republic of Belarus for 2006 – 2010 elaborated by Minstat is well itemizing the action that should be undertaken in all other areas of statistics (see pages 5 – 25). We will not repeat that in this report.

It seems however that in longer term the attention should be paid to statistical observations of so called “third sector” (non – profit) of the national economy, i.e. on the activities on non - market services provided by governments, non – governmental organizations (NGO’s), social, political, cultural, religious, professional organizations, including local organizations and – last but not least – non profit activities of commercial subjects. The role of this non – profit sector in developed market driven economies is growing. The measuring of economic and social effects of non – profit activities fills in the gaps in statistical description an analysis of social and economic phenomena on national, regional and local levels.

Building statistical capacity one can con forget on the creation of methodological and analytical expertise for elaboration of satellite accounts. Satellite accounts are an indispensable component of comprehensive analyses and explanation of specific phenomena of opened, globalized, market driven economy with deep institutional influence of governments and international organization.

The following satellite accounts that may be of importance for Belarus economy should be mentioned:

- Agricultural accounting
- Health accounts
- Education accounts
- Environmental accounting
- Tourism accounts
- Research and development

The studying and adoption of international recommendations to the specific national conditions and needs of Belarus nation and economy, and experimental implementations of the satellite accounts, needs high level experts and resources for international collaboration in that field.

6.19. Transition of methodology – preliminary conclusions

1) The Minstat is well prepared for the realization of the roadmap of the NSDS in the field of transformation of the methodology in specific areas of statistics. Program of Development of State Statistics for 2006 – 2010 is good basis for effective modernization of the NSS and optimal use of the resources available for official statistics.
2) Priority actions in the field of methodological development are:
   - Full implementation of international standard classifications of activities, products, occupations, and other international standards for SNA and specific branch statistics. By *full* implementation we understood the implementing of national versions on the level of particular surveys, not on the level of compiling aggregated data for international statistical organizations.
   - Upgrading the central statistical business register and integrated system of statistical frames
   - Develop methods to cope with quality change, an import feature of modern economies. This will involve the departments for price statistics, industrial statistics, construction statistics and foreign trade statistics.
   - Seasonal adjustment of time series with a strong seasonal component.
   - Apply standard methods for evaluating data quality to a wide range of data sets from various departments.

3) Priority actions in the field of survey management and technology of the NSS are:
   - Deep modernization of the ICT architecture of Minstat (hardware and generalized software as proposed in expertises)
   - Prepare detailed statistical specifications for the new databases to be created in the framework of Task Number 48 of the State Program “Electronic Belarus”.

- New methodology of design of statistical questionnaires.
- Central metadata base for the whole system of official statistics in Belarus centralized and decentralized.
- Implementation of electronic questionnaires and electronic data collection.
- Implementation of integrated system of statistical data bases.
- Upgrading the computer literacy of statistical staff (by training and training on the job)
- Systems assisting the programming and coordination of surveys and databases of the system of official statistics (both central and branch statistics).

The organizational structure of the Minstat (regional structure) may be revised and optimized after the conducting of the population census and finalization of the planned process of complex modernization of the ICT in Minstat

4) Analysis of impact of the ISIS on the distribution of methodological and analytical tasks between central, regional and local statistical offices and respective redistribution of resources is an integral part of the strategy of implementation of ISIS.
5) The upgrading of the ICT is the prerequisite for implementation of the tools and methods supporting the methodological transition. Continuous research and analysis of progresses in ICT and its impact on statistical activities, analysis of best practices of other countries, and dissemination of this knowledge to the staff of official statistics (seminars, conferences, training, study tours) are the prerequisites of active participation of statistical staff in the realization of ISIS in Belarus official statistics.
6) Total costs of methodological works related to the continuing of the transition process of Belarus statistics for 2007 – 2010 are estimated (by RIS) for about 2690 000 USD (see Ch.7 below).

6.20. Summary of recommendations

1) The Minstat is well prepared for the realization of the Integrated Statistical Information System covering all the system of official statistics of the country. The analysis of existing state of the art of official statistics is comprehensive and the effects that shall be achieved as the results of the realization of ISIS are clear and convincing.
2) Priority projects for developing the ISIS are:
   - Deep modernization of the ICT architecture of Minstat (hardware and generalized software as proposed in the expertises)
   - New methodology of design of statistical questionnaires
   - Upgrading the central statistical business register and integrated system of statistical frames
   - Central metadata base
   - Implementation of electronic questionnaires and electronic data collection
   - Implementation of integrated system of statistical data bases

- Upgrading the computer literacy of statistical staff (by training and training on the job)
- Systems assisting the programming and coordination of surveys and databases of the system of official statistics (both central and branch statistics).

3) Analysis of impact of the ISIS on the distribution of tasks between central, regional and local statistical offices and respective redistribution of resources is an integral part of the strategy of implementation of ISIS.

4) Continuous research and analysis of progresses in ICT and its impact on statistical activities, analysis of best practices of other countries, and dissemination of this knowledge to the staff of official statistics (seminars, conferences, training, study tours) are the prerequisites of active participation of statistical staff in the realization of ISIS in Belarus official statistics.

7. Resources needed for the realization of road map of the NSDS

7.1. Types of resources needed for the strengthening the statistical capacity

The implementation of the strategy of development of national statistical system requires the complex of resources necessary for conducting statistical activities:

- Statistical staff
- ICT
- Technical infrastructure
- Financial resources

The sustained and harmonized availability of all kinds of resources is the prerequisite of efficacy of the NSS. It refers to all statistical services, both in the centralized statistics (Minstat and subordinated regional statistical offices) and in the statistical services in the ministries, in other governmental institutions and in the National Bank of Belarus. All statistical services of the country should be treated as the subjects and objects of one integrated information system. The management of resources for statistics should refer to the whole NSS. The optimization of the resources could not mean e.g. the budget cuts in one segment, savings in one kind of resources. The excessive saving in only one segment of statistics will inevitably increase the costs of other stakeholders of statistics.

The core of the NSS in Belarus is the centralized statistics managed by the Minstat as the coordinator of the whole system, the executor of most of the surveys and analyses and the organization leading in the development of methodology. The resources available for centralized statistics are decisive for the development of the NSS as a whole and for the realization of the NSDS.

In this report we focus on the resources needed by centralized statistics. It does not mean however that the progresses in the realization of the roadmap can be achieved without respective resources provided for other statistical services.

7.2. Statistical staff

Statistical staff is the most important resource of any statistical system. The quality and quantity of statistical staff determines the quality and quantity of statistical information, cooperation with respondents and users. In all countries centralized statistics (CSO's and their regional branches) are creating human and intellectual resources for the whole NSS[18]. Common

[18] In some countries the CSO's are educating the statisticians for statistical services of other ministries. E.g. in France the managers of statistical services of ministries should - as a rule – have some period of professional practice at INSEE.

practice is that specialists educated in the CSO and regional statistical offices move to statistical and analytical units of other ministries and regional governments (and to the private sector – mainly financial corporations and large enterprises).

The centralized statistics (Minstat and other statistical offices) plays crucial role in developing the human resources for all statistical system.

Number and structure of staff by skill (1.11.2006)

		Total employment	Of which statisticians
Total	persons	2626	2273
	%	100.0	86.6
Minstat	persons	369	305
	%	14.1	82.7
Regions	persons	2257	1972
	%	85.9	87.4

Analyzing the structure of the staff of centralized statistics (Minstat and regional offices) the following conclusions are driven out:

1) There is relative shortage of staff in Minstat headquarter, having in mind the facts, that:
   - almost all methodological work is done at the Minstat,
   - in transition period the scope of methodological works is growing,
   - the methodologists and analysts are or should be involved in education and training of other statistical staff in Minstat and in the ministries,
   - the methodological and analytical staff is - as a rule – involved in managing or supervising statistical production.

1) It is necessary to strengthen the methodological and analytical units in the statistical departments of the Minstat, with special reference to those subjects – matter areas of statistics that are on the critical path of the roadmap of the NSDS, specified in Ch. 6.
2) In case of technical problems with strengthening the capacity of the staff in the Minstat headquarter in Minsk, it may be considered the creation of methodological and analytical units in some regional statistical offices. However decentralization of methodological works to regional statistical offices is admissible only for the fields of statistics that do not need operational contacts with ministries and other central governments (e.g. regional statistics, environmental statistics, selected social phenomena). It should be also taken into account the role of the City of Minsk as the political, financial, industrial, cultural, scientific and social center of the country. Therefore special position of the statistical offices of the city of Minsk and the Minsk oblast in the development of the NSS may be considered.
3) It seems that in Belarus the policy of strengthening methodological capacity in regional statistical offices is rather limited in short run. It needs long term policy, starting with the specializing of particular regional offices in the production of statistics for the country (collection of data for a given set of questionnaires for the country, data editing and production of output data for the country). On the basis of experience of the staff of a given regional office in the production of statistics for the country as a

whole, the methodological and analytical capacities in the given field of statistics may be developed.

4) Important role in the development of human and intellectual capital of the NSS shall play the Research Institute of Statistics (RIS) and the Computing Center of Minstat. The RIS is proper organizational structure for conducting preparatory works for elaboration and experimental implementation of statistical surveys of new phenomena and processes, of developing new methods, analyzing the developments in world statistics and best practices of other NSS and their creative adoption to the needs of the NSS.

5) The program of systematic education and training of statistical staff of Minstat, of all ministries and other organization involved in realizing official statistical surveys and statistical data production should be elaborated and adopted as the part of regular statistical activities. The program should include :

   - statistical ethics and fundamental principles of official statistics,
   - official statistics: national and global system of official statistics (foundations, organization, functioning), information infrastructure of modern state and economy, role of official statistics in the information infrastructure,
   - general statistical knowledge of statisticians, especially in those fields of statistical theory and academic knowledge, that are not sufficiently taught at the universities, e.g. theory of statistical frames and different approaches to sampling surveys, advanced statistical analysis, imputation and dealing with non – response, statistical data editing, time series management etc.
   - modern statistical software, ICT for statisticians,
   - design, organization and realization of statistical surveys (for different types of surveys and data sources),
   - statistical data management (incl. statistical databases, archives, data confidentiality protection),
   - statistical metadata theory and methods of metadata development, maintenance and management,
   - statistical standards (international, national; adoption, implementing, use and updating of standards),
   - methodological foundations of specific statistical domains - training of statisticians working in specific subject matter areas of statistics and of institutional users of statistics,
   - technical training of statisticians involved in the realization of specific surveys,
   - optional training for respondents supplying data to statistics (using also the e-learning methods related to specific surveys and questionnaires)
   - seminars for high level managers in governments – stakeholders of the NSS, on strategic problems of the NSS and of global statistical system
   - seminars for professional mass media disseminating statistical information
   - uniformed program of obligatory training of newcomers to official statistics (to Minstat and other ministries) .

Realization of comprehensive program of statistical education and training is of utmost importance for strengthening the intellectual and professional capacity of the NSS. In

the balance of the work time of statisticians there should be envisaged the time for upgrading the skills by self – education, as well as the education in the forms of organize training courses.

The formation of high level professionals should include also the post graduate studies, elaboration of PhD theses, writing scientific papers, presenting the paper on the conferences (national and international), professional and scientific stages in foreign and national agencies and institutes. Active participation of Belarus statisticians in international actions of formation of intellectual and professional capital of statistics shall be important especially for solving difficult problems o transition of Belarus statistics in many statistical fields.

In the annual budgets for official statistics (inbudget of Minstat, as well as other ministries and institutions) the indispensable resources for financing of education and training, elaboration of training materials, should be envisaged.

The estimates of funds needed for the elaboration and realization of the education program of official statisticians (for 5 years and annual funding) should be done on the basis of the "map" of subject matter areas of training, estimates of costs of elaboration of programs and training materials and on the detailed analysis of the needs (number of staff covered by education and training actions).

7.3. ICT and basic complexes of the ISIS

As it mentioned above, the modernization of the ICT infrastructure of official statistics is the chain of actions laying on the critical path of the roadmap of the NSDS.

Although the Belarus has designate significant budgetary resources for the upgrading of the ICT in centralized statistics (the Minstat), the level of computerization of statistical offices, both the headquarter and the regions, is far from the ICT level in other countries. This technological "backwardness" is in contrast with relatively high ICT literacy of statistical staff (with secondary and university education). It seems that modern ICT (both hardware and software) shall be quickly and efficiently "absorbed" into statistical practice if proper training is provided for the users.

The tables below (taken for the mentioned above report of A. Korns) show the deepness of the technological gap in the centralized statistics.

Table 7.3.1.

Number of working PC's at year-end, 2001-05[19]

a. At Minstat headquarters

Year	Pentium IV	Pentium III & II	Pentium earlier	486	Others	TOTAL PCs
2001		75	170	41	3	289
2002		66	155	31		252
2003		71	157	28		256
2004	13	68	154	20		255
2005	61	68	134			263

b. In the oblasts and rayons

Year	Pentium IV	Pentium III & II	Pentium earlier	486	Others	TOTAL PCs
2001		68	385	127	54	634
2002	9	72	425	138	53	698
2003	74	70	449	150	45	788
2004	88	71	518	135	38	850
2005	145	71	518	135	38	907

C. PC's per 10 government workers, 2005

	Minstat	Oblasts & rayons
Number of PC's	263	907
Number of government workers	347	2015
PC's per 10 govt workers	7.6	4.5
Pentium IV's as a percent of PC's	22%	15%

The tables indicate that many PC's are obsolete at both the Minstat headquarters and in the oblasts and rayons; furthermore, the rate of annual purchases is so low that obsolescence is unlikely to end soon without a major increase in spending for new computers.

Similar analysis should be done by each ministry participating in the NSS. On the selective overview it seems that nowadays the ICT level potentially available for statistical services of other ministries and of the National Bank of Belarus, is better that that of Minstat. The ministries have invested in the ICT for their administrative information system, and the ICT level of the NBB is comparable with other central banks of the European region and meets the ICT international standards for banking sector.

The existing level of the ICT in he centralized statistics makes difficult, and to large extent, makes impossible the effective implementation of modern methods of survey design an organization, quality control, collection of data, dissemination of statistics and optimizing the costs of surveys for all stakeholders. The upgrading of the ICT level is the prerequisite of the realization of the roadmap of the NSDS in all other areas.

First of all it is necessary to create technological foundation of the ICT network (statistical intranet) linking all statistical units managing surveys, metadata and data (both the

[19] From Korns A., op.cit. p. 16

Minsnat, other ministries and the NBB) in one interoperable information system. Second objective is to implement the internet – driven interoperability between statistical units, respondents and users.

The main actions that should be undertaken AS SOON AS POSSIBLE to fill in the technological gap in centralized statistics are:

- Upgrading the servers managing the intranet, database systems and internet applications,
- Installation of the workstations switched to the statistical intranet for all statistical and managerial staff of the Minstat and regional statistical offices, upgrading the level of existing workstations (total number of workstations – equivalent to the number of the staff),
- Licenses for respective statistical software (office, software for statistical surveys design, data editing, statistical analysis software, DBMS, data warehouse, GIS software); specific software products should be chosen by Minstat on the basis of actual products available on the market, with special reference to the software distributed within the international assistance programs on preferential conditions for developing and transitional countries.

Total costs of the realization of the actions mentioned above preliminary estimated by the RIS are following:

Total costs of ICT for the ISIS (estimation) 6 000 000 USD

of which

- Servers and related hardware and generalized software - 310 000 USD
- 2009 Population Census[20] - (2150 workstations) and auxiliary equipment 862 000 USD
- Software licenses 443 000 USD

The total estimation (done by RIS) of costs of the realization of the roadmap for 2007 – 2010 is presented in Table 7.5.1. The estimates should be verified according to concrete actions, the schedule of heir realization, real prices of ICT in the contracts and the availability of financial resources.

The RIS ad also estimated the costs of basic systems that are of the priority in the program of implementing the ISIS.

[20]The part of the costs for workstations for the ISIS infrastructure shall be covered within the frames of creating of the ICT basis for the population census 2009

Table 7.3.2.

No.	System	Period	Costs	
			Roubles, mln	USD, thousands
1.	Metadata base	2007-2010	560,00	261,68
2.	Time series database	2008-2011	840,00	392,52
3.	Corporate system of documentation flows	2008-2010	410,00	191,59
4.	Data security system	2007-2011	280,00	130,84
5.	System of dissemination of statistical data and metadata	2009-2012	620,00	289,71
6.	System of primary data collection in electronic form	2009-2010	230,00	107,48
7.	Modernization of the statistical register	2008-2010	220,00	102,80
	Total	-	**3160,00**	**1476,64**

7.4. Technical infrastructure of centralized statistics

The investments in staff, ICT and other technologies need also the upgrading of statistical offices. The conditions of work of statisticians in Minstat and other offices is below the level of modern offices. The upgrading of those conditions is necessary. It shall have positive impact on providing information services to the users, cooperation with respondents as well as is necessary for the efficacy of the work of the statisticians themselves.

Main part of the construction works and office equipment is complementary with the installation of the ICT in statistical offices within the frames of the development of the ISIS.

Total costs of the construction works and office equipment estimates of the RIS on central and regional level is about 669 000 USD.

It is also estimate that the resources for modernization of typography (including the needs of the population census 2009) amount about 1 600 thousands USD.

7.5. Financial resources - summary

The RIS has estimated additional resources needed by the centralize statistics for the realization of the objectives if NSDS defined in the roadmap.

Table 7.3.3.

Costs of realization of actions for 2007 - 2010

No	Action	Estimated costs in thousands USD
I.	Methodological works and implementation of international standards in main fields of statistics - of which R & D	2390,0 840,0
II.	ICT and ISIS (hardware, software)	6000,0
III.	Education and training (annual costs 27,5[21])	110,0
IV.	Printing and dissemination technology	1500,0
V.	Total	10840,0

The consultant does not have technical possibility of verification of the above estimates of needs for financial resources. Anyway, comparing with the costs of upgrading the technological level and of costs of methodological works necessary for implementing international standards and providing internal and international interoperability in some countries in transition, the estimates seem to be realistic. Concretization of the costs of particular actions and projects shall be determined successively in due time, in the process of budgeting.

[21] The costs of training seem to be heavily underestimated. More realistic would be the annual amount of 100 000 – 120 000 USD.

8 Concluding remarks

1. The Republic of Belarus has clear middle term vision (for 2007 – 2010) of transition of official statistics, its methodological integration and interoperability with global system of statistics coordinated within the EU. The Program of Development of State Statistical System for 2006 – 2010 defines the objectives of transition of Belarus statistics in coherence with international standards, taking into account specific (administrative) functions of statistical offices in the existing economic model of the country.

2. The Minstat has strong legal foundations and professional capacities of coordination of the national official statistics in existing decentralized model.

3. The Minstat is the coordinator of one of the strategic information systems of the country that plays fundamental role in the development of information standards and integrity of social and economic information.

4. The impact of the program of *Electronic Belarus* on official statistics should be taken into account in the formulation middle – term objectives and concrete operational decisions of development of the information infrastructure of official statistics.

5. It is suggested to use the conclusions driven from the SWOT analysis presented above for optimization of the use of existing capacities, for defining efficient ways of strengthening institutional, intellectual and technological capacity of official statistics, identifying the bottlenecks and defining the priorities of allocation of reousrces.

6. The actions related to the upgrading of the ICT and building the ISIS are lying on the start of the critical path of the roadmap of the NSDS. Their realization will determine the efficacy of all actions and undertakings of transformation of statistical methodology, development of surveys, interoperability and optimization of the organization of the NSS as a whole.

7. Taking into account the time of realization of the population census 2009, it is suggested to postpone the introduction of deeper organizational changes in the centralized statistics (restructuring of local and regional statistical offices) for the period after finishing the census and elaboration of its results. On the other hand, the investments in the ICT for the census should be in line with the long term needs of the development of the NSS outlined in its long term vision.

8. Common education and training program of statisticians (in centralized and decentralized statistics) and of other statistical stakeholders is an important long term priority of the NSDS.

9. For effective realization of transition of official statistics, strengthening the capacity of the R & D (especially the RIS) should be given high priority. Basic methodological works that need research, especially creative transformation of interna-

tional standards and methods to national conditions, shall be realized in the form of R & D projects within the frames of the program of official statistics.

10. International cooperation of official statisticians with international organizations and with the statistical offices which have the expertise and experience in transition of statistics may be helpful in the navigation of the Belarus statistics on the roadmap of the NSDS and in its dynamic updating and adjusting to the changing environment.

11. The NSDS is useful as the general foundations for elaborating operational documents:
    - Middle - term program of development of official statistics (e.g. 5 years plan);
    - Annual programs of investments in official statistics;
    - Regulations concerning the restructuring of statistical offices and services;
    - Drafts of annual budgets for statistical activities of the Minstat and of other ministries;
    - Programs of research works, education activities and experimental implementation of new methods and surveys.

12. The realization of the NSDS as the long term strategy of the development of official statistics of the Republic of Belarus should be continuously monitored by Minstat. The observations from the monitoring are useful for elaboration of operational documents. The monitoring is also the basis for cyclic revision of the NSDS. Next revision in Belarus is suggested for 2010, i.e. after the population census as the milestone in the modernization of the infrastructure of centralized statistics and finalizing if implementation of all basic international standards and surveys strengthening the coherence and integrity of Belarus official statistics with the global statistical system and adjusting to the existing model of market – driven economy of the Republic of Belarus.

Warsaw, 2007-05-31