

**ANALYSIS OF THE APPLICATION AND BASIC AREAS OF DEVELOPMENT
OF MODERN INFORMATION AND COMMUNICATION TECHNOLOGIES IN
THE STATISTICAL INDUSTRY OF THE REPUBLIC OF UZBEKISTAN**

Jukovskaya Irina Yevgenyevna,

PhD in Economics, Associate Professor, Head of

«Information Technologies in Economics» Department

Tashkent State University of Economics

Abstract: This article is devoted to the analysis of application of information and communication technologies (ICT) in the statistical industry of the Republic of Uzbekistan and revealing the problems of ICT application. In addition, the article presents developed proposals for the efficient use of ICT in the statistical industry of Uzbekistan.

Key words: information systems and technologies, efficiency, quality of information processing, optimization.

Introduction. Formation of the digital economy in the global economic area issues the challenges for countries and continents to improve the forms and techniques of managing an innovative economy and, as a result, this fact leads to a reorientation of the activities of statistical agencies and expansion of the alignments set for statistical reporting.

Within the framework of the digital economy it is impossible to imagine the performance of the statistical industry without the application of modern technical facilities and advanced ICT.

In the modern era on the basis of the Resolution of the President of the Republic of Uzbekistan № PR-1989 “On measures for further development of the information and communication system of the Republic of Uzbekistan” as of June 27, 2013, in Uzbekistan each ministry and agency has field-specific information systems and a representative office on the Internet (Resolutions, 2013). In addition, with the aim of executing the Resolution of the President of the Republic of Uzbekistan № PR 3165 “On measures to improve the activities of the State Committee of the Republic of Uzbekistan on Statistics” as of July 31,

2017 (Resolutions, 2017) and the Resolution of the President of the Republic of Uzbekistan № PR- 4273 “On additional measures to ensure openness and transparency of public administration, as well as raising the country’s statistical potential” as of April 9, 2019 (Resolutions, 2019), there has been implemented a comprehensive set of objectives to introduce advanced ICT and information systems in the performance of the State Committee of the Republic of Uzbekistan on Statistics.

The State Committee of the Republic of Uzbekistan on Statistics is considered to be a public administration body implementing a unified policy aimed at creating and functioning of a comprehensive advanced statistical information system based on scientific methodology, international standards and regulations with the account of the national peculiarities of development, satisfying the needs of public authorities and management, business entities, citizens and agencies in obtaining the official statistical information in the field of statistics in the Republic of Uzbekistan (www.stat.uz).

The State Committee of the Republic of Uzbekistan on Statistics arranges organization of statistical activities on the basis of the following principles:

- reliability, objectivity, fairness;
- urgency, comparability and stability;
- accessibility, transparency and openness;
- exclusion of any interference with the procedure for collecting, processing and summarizing the statistical information (www.stat.uz).

It is impossible to imagine management of the statistical industry in reliance upon the compliance with these principles without efficient application of modern advanced information and communication technologies (Begalov and Jukovskaya, 2013).

Within the framework of developing the digital economy the information technology industry has the potential of global competitiveness and should become one of the most significant drivers for ensuring the economic growth in the country.

ANALYSIS AND RESULTS

The modern information system of the State Committee of the Republic of Uzbekistan on Statistics includes a comprehensive range of subsystems: field-specific specialists, hardware, software that implements data processing using various management techniques and models based on particular algorithms (Figure 1).

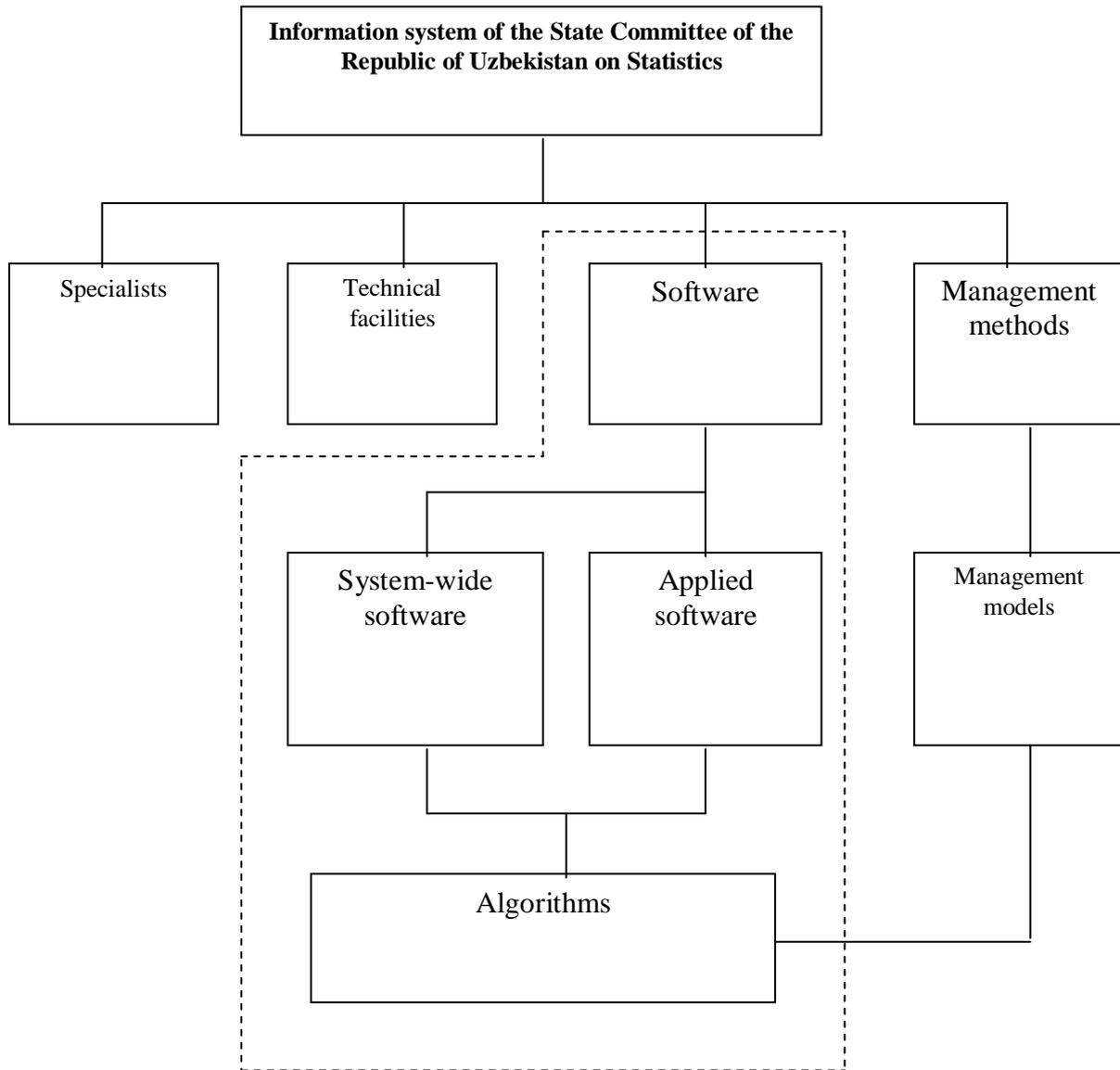


Figure 1. Generalized scheme of the information system of the State Committee of the Republic of Uzbekistan on Statistics*

As it is obvious from Figure 1, the basic components of the information system of the State Committee of the Republic of Uzbekistan on Statistics are field-specific specialists in the executive office, complexes of hardware and software, models and

* Developed by the author on the basis of the data of the State Committee of the Republic of Uzbekistan on Statistics

techniques of processing statistical information, as well as teaching aids. The prior goal of the information system of the State Committee of the Republic of Uzbekistan on Statistics is the entire satisfaction of the information needs of final users in due time (Table 1).

Table 1.

Peculiarities of the basic components of the information system of the State Committee of the Republic of Uzbekistan on Statistics [†]

Information system components	Assignment	Techniques and facilities
Executive office (management)	Management of the State Committee of the Republic of Uzbekistan on Statistics, branch specialists, operating staff	Providing management processes in the industry
Set of technical facilities	Technical facilities of the State Committee of the Republic of Uzbekistan on Statistics on statistics, network equipment, office equipment	Ensuring implementation of the tasks of statistical processing and management
Techniques, models, specific data processing programs and solution of managerial tasks	Direct calculation operations, economic and mathematical methods and models, heuristic approaches	Implementation of the management model
Techniques and models of data organization	Methods of analysis, sorting, data storage, data search, data processing, etc.	Preparation of data for use in managerial problems solution
Data storage media	Documents, electronic storage media	Operation with folders, files and documents
Guidance materials, instructions	Industry techniques, job descriptions, technological instructions, instructions for application of management methods and facilities	Organization of interaction of users in a single information system of the State Committee of the Republic of Uzbekistan on Statistics

As it is obvious from Table 1, the prior goal of the information system of the State Committee of the Republic of Uzbekistan on Statistics is the entire satisfaction of the information needs of final users in due time. This goal is divided into the following structural components:

- providing a comprehensive set of information for managerial decisions;

[†] Developed by the author on the basis of the study of the information system of the State Committee of the Republic of Uzbekistan on Statistics

- providing information on various requests as urgently as possible;
- providing information in a form appropriate for making various managerial decisions;
- ensuring constant supervision of interdepartmental and inter-agency information interaction, as well as the compliance of the decisions made.

Currently a whole range of information systems has been operating in the State Committee of the Republic of Uzbekistan on Statistics (Table 2). All systems except for the “Personnel Management” information system and electronic document management system of the State Committee of the Republic of Uzbekistan on Statistics are provided with the access through the global computer Internet network (www.stat.uz).

In compliance with the implementation of the Resolution of the President of the Republic of Uzbekistan PR №999 as of November 13, 2008, the statistical authorities have been equipped with modern computer facilities, telecommunication and peripheral equipment, as well as with licensed software. Meanwhile, the corporate information network of the State Committee of the Republic of Uzbekistan on Statistics has been updated and expanded with incorporating of district and city departments on statistics therein. Centers for software and hardware support and data storage have been established in the territorial offices on statistics which carry out activities on the development of ICT in the regional subdivisions of the State Committee of the Republic of Uzbekistan on Statistics.

Table 2.

Data on the systems operating in the structure of the State Committee of the Republic of Uzbekistan on Statistics[‡]

№	Information system name	Main tasks accomplished by the information system
1	2	3
1.	Information system “Personnel Management”	1. Staff schedule management; 2. Admission, promotion, transfer between departments; 3. Training, qualification upgrading and certification of employees; 4. Dismissal of employees; 5. Support for various compensation schemes; 6. Payroll calculation
2.	Electronic library of guidance	Providing guidance provisions and instructions for

[‡] Developed by the author on the basis of the data of the State Committee of the Republic of Uzbekistan on Statistics

№	Information system name	Main tasks accomplished by the information system
1	2	3
	materials “E-stat Library”	organizing and carrying out statistical observations
3.	Information and analytical system “Gender statistics of Uzbekistan”	The website gender.stat.uz in three language versions - Uzbek, Russian and English - provides users with the information on the gender aspect by such areas as demography, healthcare, education, labor, social protection and others. All statistical information is presented in the form of tables and animation diagrams on this site.
4.	Automated information system for collecting statistical reports in electronic form “eStat 3.0”	Automated procedure for gathering statistical information from legal entities according to the established procedure
5.	Automated information system for accounting and identification of legal entities based on the United State Register of Enterprises and Organizations «Reg-System»	The objectives of the information system are the automation of the processes of gathering, storage, control and analysis of the information on legal entities obtained from registering and other public authorities, as well as the provision of information to the public administration authorities and other users according to the established procedure
6.	Reserve database of electronic statistical reports «Base»	Storage of information on statistical reports of economic entities upcoming to the State Committee of the Republic of Uzbekistan on Statistics
7.	Electronic document management system of the State Committee of the Republic of Uzbekistan on Statistics	Improving record keeping, automation of information support for decision-making processes, creating a unified system of document accounting, systematization and supervision over their implementation
8.	Web-services: - Consumer price index calculator; - on-line counter of the population of Uzbekistan	Operations on relevant areas with the application of web-technologies

As a result, there has been established the Unified Information System of the State Committee of the Republic of Uzbekistan on Statistics which represents the combination of information resources, information systems, software and hardware and telecommunications facilities of the state statistics authorities ensuring collection, processing, storage and use of statistical information (Begalov and Jukovskaya, 2013).

However, the analysis of the information system has illustrated availability of current problems in this industry, in particular:

1. Several software products that are not fully integrated into the unified information system are operating in the system of the State Committee of the Republic of Uzbekistan on Statistics.

2. “Human factor” makes a great impact on the functioning of the information system.

3. With the simultaneous submission of statistical reports electronically using the “eStat.3.0” program by a large number of enterprises and agencies of the national economy, the speed of the system is slowing down.

4. When integrating the Information System (IS) into the unified information system, it is necessary to take into account the integration of a large amount of data available on the server. Inadequate support for the data quality of (in a single format, not duplicate, agreed upon) in the IS of the majority of enterprises constitutes their integral part of them. It should be noted that most often, such a problem is not taken into account when introducing new ISs and this is mainly the reason that at the end of the implementation project, the enterprise receives a new system containing its own set of data that is does not reasonably complies with the data from other systems. It addition, it is a significant fact that when arranging the interaction of these systems, the lack of data compliance can result in the fact that the systems integration is available, but there is no data integration. As a result, it is even possible to obtain several data sets in one system - identical in essence, but different in the way they are presented.

5. One of the problems in the process of the IS integration is the transfer of data from information arrays of previously used programs to the integrated IS database.

With the aim of arranging such a process, all the information contained in the old information structure must be converted in some way into the format in which it can be imported into the database of the new system. The current level of development of data exchange standards between dissimilar software tools makes this process a rather difficult task (Begalov and Jukovskaya, 2018). In this regard, with the aim of implementing the process of the information flow, specialized adapter programs are designed to ensure compliance with the import/export data formats of various programs and maintain the integrity of the information.

6. There is no precisely developed technique for using Web services to collect and provide statistical data to a wide range of users.

7. The existing information system of the State Committee of the Republic of Uzbekistan on Statistics assumes the use of mobile devices only for certain areas of statistical data collection and analysis.

8. Taking into account that the population census will be carried out in Uzbekistan in 2022, it is necessary to improve the information security system.

9. The methodological aspects of integrating the statistical information system into the National Information System of the country are inadequately presented, however, this fact is essential for the implementation of the program “Digital Uzbekistan 2030”.

10. With due regard for upcoming massive statistical research, it is required to strengthen the technical base of the State Committee of the Republic of Uzbekistan on Statistics.

11. On the basis of improving the technical and software components of the information system, it is necessary to envisage an increase in the functional components of the information system.

12. Innovative developments are not always used due to the insufficient speed of the computer network.

In this regard, we propose the scheme for modernizing and upgrading the information system of the State Committee of the Republic of Uzbekistan on Statistics. This scheme is presented in Figure 2.

In particular, it is necessary to develop the methodology for the IS integration since every day the need for processing more information volumes is constantly increasing. In each particular case, before starting activities on creating a new IS and integrating it into the enterprise management structure, it is required to carry out a detailed comprehensive analysis of the management system, data flows, organization of their storage, information processing and presentation in the form of reports that are understandable to both ordinary users and the management.

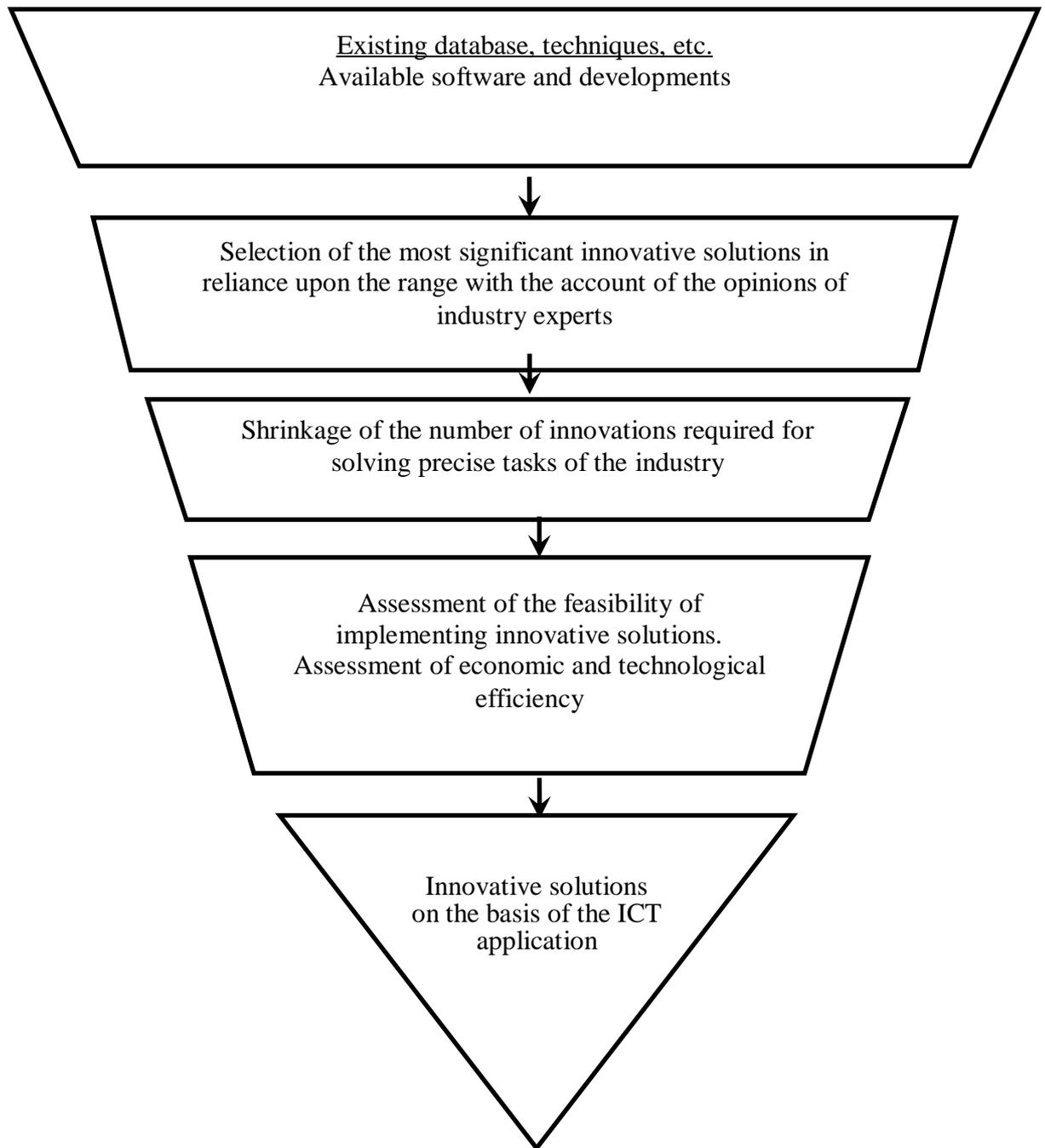


Figure 2. The conceptual scheme of modernizing the information system of the State Committee of the Republic of Uzbekistan on Statistics[§]

In addition to solving organizational and managerial tasks, the development of data transfer tools from old platforms to newly created ones and implementation of Big Data technology is considered to be an important component of the IS integration process.

Conclusion. The solution of the problems identified will enable to determine the presence of interaction between internal and external factors in the information system,

[§] Developed by the author on the basis of the study of the specialized literary sources and data of the State Committee of the Republic of Uzbekistan on Statistics

provide a systematic approach to solving problems in the national statistical industry, evaluate the relationship with all innovative processes in the national economy, ensure a targeted approach to economic objects depending on their specialization, as well as elaborate new requirements for managerial statistical models, thereby ensuring the efficiency of managerial processes in the statistical industry and intersectoral economic complex of the national economy.

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