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# **Analysis of Information Flow in a Centralized Database of Integrated Management Systems (On the Example of the Tax Administration)**

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**ABSTRACT:** In recent years, the reform of the tax system has been identified as one of the main programs for the development of new tax policy and the modernization of the electronic communications system with citizens. This article analyzes the flow of information in the tax administration management system, an overview of intelligent management methods, and the process of controlling the flow of information based on the work of the expert community. For tax inspectors, we developed a direct-linking AIS and software for managers of tax inspectors in an authorized network.

**KEY WORDS:** Authorization, forecasting, automated information system, software, expert group, algorithm, tax revenues.

## **I. INTRODUCTION**

Our government has taken important steps to join the ranks of advanced countries in the implementation of "e-government" in all sectors of the economy, the widespread introduction of modern information and communication systems in everyday life.

As a result of the introduction and development of e-government, according to the results of the biennial e-government rating of the United Nations, Uzbekistan rose 20 places in 2016. can be quoted.

The Action Strategy for the five priority areas of development of the Republic of Uzbekistan for 2017-2021 also pays special attention to the further development of e-government.

Therefore, our government has set a number of priorities to further improve the use of information and communication technologies in the tax system. In particular, the Decree of the President of the Republic of Uzbekistan dated December 12, 2017 "On measures to radically reform the national system of public services" No. PF-5278 and adopted on July 18, 2017 "On Taxation" Decree No. PF-5116 "On measures to radically improve the administration, increase the collection of taxes and other mandatory payments" [2] The use of modern information and communication technologies, applications and interactive services in the activities of tax authorities Relevant requirements for the wide implementation of the potential were highlighted.

## **II. SIGNIFICANCE OF THE SYSTEM**

The analysis of the database of integrated management systems in the article is based on the example of the tax office. The study of the literature is discussed in Chapter III, the methodology in Chapter IV, the experimental results of the study in Chapter V, and the further study and Conclusion in Chapter VI.

## **III. SYSTEM ANALYSIS**

Today, the automated management system of the tax authorities uses 35 automated information systems (hereinafter AAT), 10 software products (hereinafter DM) and more than 50 interactive services through the internal local and corporate network [12]. Currently, the e-government portal of tax authorities, my.soliq.uz, offers several types of



interactive government services to individuals and legal entities, as well as individual entrepreneurs. As a result, from the beginning of the year to the end of September, 2,109,906.75 mln. soums in electronic form to the state treasury. This indicates that the electronic communication between the population and the tax authorities is improving [4,5].

Today, the State Tax Committee, the State Tax Administration and the State Tax Inspectorate have an internal network called "Authorization", in which all inspectors work in an automated workplace. In order to ensure the implementation of the tasks set by the Resolution of the President of the Republic of Uzbekistan dated January 8, 2010 No PP-1257 "On measures to further modernize the system of tax authorities", the new modern ORACLE platform relies on a database SIAIJ-4 software product based on WEB technologies was developed. The automated information systems available in the automated management system are based on the ORACLE platform and are used directly from the regional state tax inspections through a local area network. Based on the quarterly report, we can see that the reporting forms of the tax authorities through the interactive public services portal, several types of services are provided remotely. In particular, the analysis for September is a good example (Table 1). Currently, the network "Authorization", which is used by the State Tax Committee, tax departments and tax inspections, is formed by individuals and legal entities, as well as individual entrepreneurs. are recorded in the integrated information systems. All tax officials have access to the authorization network and have been given a login and password by a computer administrator.

Table 1. Statistical chart for September.

#	District name	1	2	3	4	5	6	7	8	Total
1	Andijan dist.	15889	2130	980	14035	3832	670	2340	457	<b>40333</b>
2	Bukhara dist.	17583	1980	1020	13760	2768	781	2600	360	<b>40852</b>
3	Ferghana dist.	22260	2584	1032	12456	3342	985	2945	721	<b>46325</b>
4	Jizzakh dist.	12416	1227	760	9780	1530	568	1679	650	<b>28610</b>
5	Namangan dist.	17796	2137	982	12857	3980	1032	2654	701	<b>42139</b>
6	Navai dist.	11007	1832	871	11345	2584	973	1788	561	<b>30961</b>
7	Kashkadarya dist.	2361	1768	1007	10821	2873	787	1542	368	<b>21527</b>
8	Samarkand dist.	24997	2342	992	13460	1900	954	1600	459	<b>46704</b>
9	Sirdarya dist.	12428	1530	642	7843	1785	459	987	265	<b>25939</b>
10	Surkhondarya dist.	19182	1873	764	9345	3215	743	1159	340	<b>36621</b>
11	Hhorezm dist.	14287	1900	890	12378	1674	1081	1643	450	<b>34303</b>
12	Tashkent dist.	27385	1785	793	11780	2290	963	1133	504	<b>46633</b>
13	Tashkent city	29610	3215	1890	22450	6340	1974	3450	898	<b>69827</b>
14	KKR	15029	1674	815	11900	2780	766	997	357	<b>34318</b>
15	<b>Total</b>	<b>242230</b>	<b>27977</b>	<b>13438</b>	<b>174210</b>	<b>40893</b>	<b>12736</b>	<b>26517</b>	<b>7091</b>	

Names of online services provided by the tax authorities:

1. The degree to which taxpayers use the personal account.
2. Personal statement extract statistics.
3. Formation of comparative acts for taxpayers.
4. The level of use of the system of identification of the taxpayer identification number.
5. Obtain a certificate of no tax debt.
6. Obtaining a certificate of residency.
7. Refund of overpaid tax.
8. Accounting for tax benefits of legal entities.

(Source: Prepared by the author based on data from the Tax and Statistics Committee).

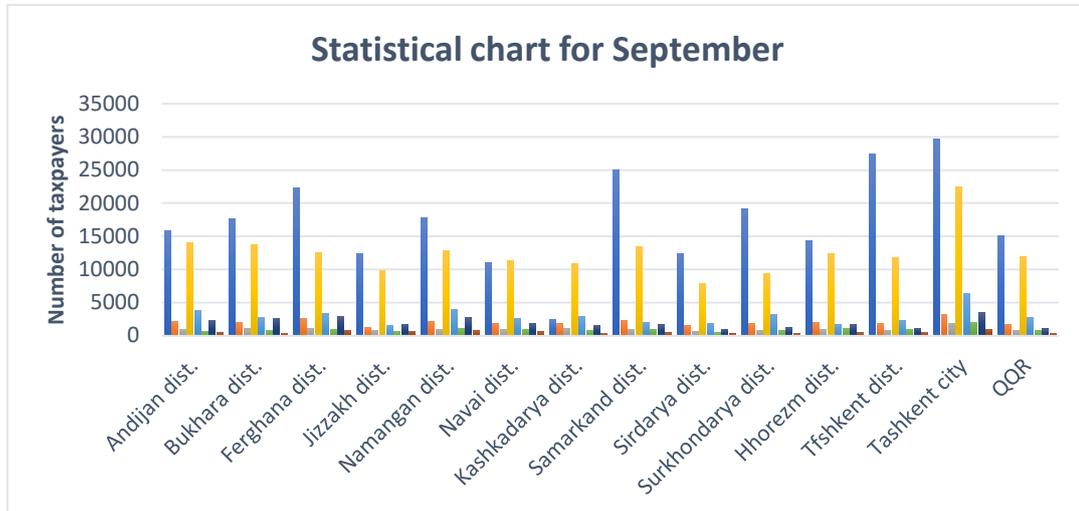


Figure 1. Diagrammatic representation of the results of statistical analysis.

From the beginning of the year to the end of September, 142,011 tons of paper were saved as a result of electronic document management through interactive services. This indicates that electronic communication between the state and citizens is expanding [4,6,8].

#### IV. METHODOLOGY AND ALGORITHMS

**Algorithm for data exchange and intelligent data analysis.** Several types of mathematical and simulation models are selected to analyze the flow of incoming and outgoing information over the local area network, and the most optimal model is recommended based on the results of the analysis. The purpose of this algorithm is to describe the sequence of data exchange in an automated control system [13].

Algorithm:

- Step 1.** Learn and collect input and output parameters for automated control system servers. Study of data exchange in the database via TCP / IP protocol in Ethernet network;
- Step 2.** Study of data protection in the internal network on the basis of the formed model;
- Step 3.** The results of expert systems and mathematical models, an overall assessment of the reliability and integrity of information using statistical analysis. Consistent analysis of the data exchange process (Figure 2).

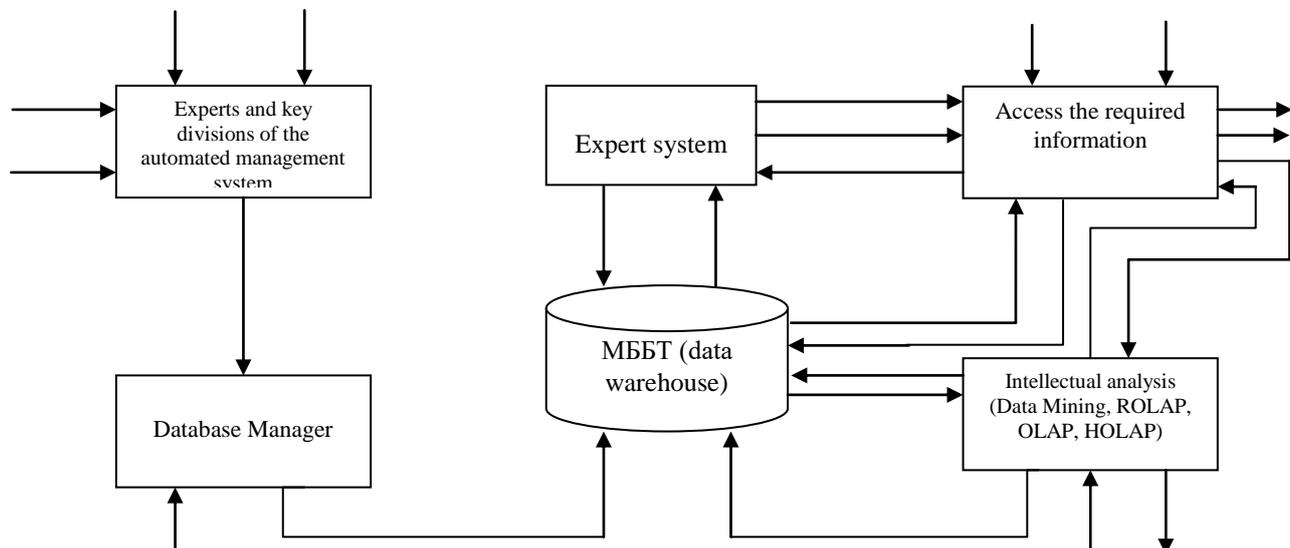


Figure 2. An intellectual analysis of an integrated database in a management system.

**Step 4.** Data processing, comparison of factors based on information analysis, as well as the process of centralization of collected data;

**Step 5.** Exploring the location of incoming and outgoing data on the servers of automated control systems, evaluating incoming data through the internal local area network and the Internet (interactive services) using a reliability identifier;

**Step 6.** Classification of incoming and outgoing data in the database, exchangeable data from the authorization network through interactive services as a result of the study of the database;

**Step 7.** Develop common monitoring procedures for automated management systems through risk assessment;

**Step 8.** Summarize the results and recommendations obtained from expert services;

**Step 9.** Develop recommendations for supporting decision-making, as well as the development of intelligent management practices;

Based on this algorithm, it is possible to perform the analysis process in the management system, which is done by forming an expert team. Referrals to experts during the examination include certain financial costs. With this in mind, the following method can be used to form an expert group.

$C_k - k$  - be the conditional cost of referral to a specialist, and  $C$  be the total value of the referral to all experts. If  $x_k = 1$ , then and  $x_k = 0$ , which is included in the expert group, and vice versa. The task of creating a highly qualified expert group may include:

$$\begin{cases} \sum_k v_r x_k \rightarrow \max \\ \sum_k C_k X_k \leq C. \end{cases} \quad (1)$$

It is known that the process of organizing the work of an expert team and summarizing the analytical results takes a lot of time. There is a need to use intelligent analysis programs in management systems based on modern standards. There is also a demand for such software in the tax administration system, offering methods and algorithms based on intelligent management tools. It will be possible to carry out the work of the formed expert group with the help of intellectual analysis software. The team of experts formed on the basis of the above formula is determined using the algorithm shown in Figure 2 below.

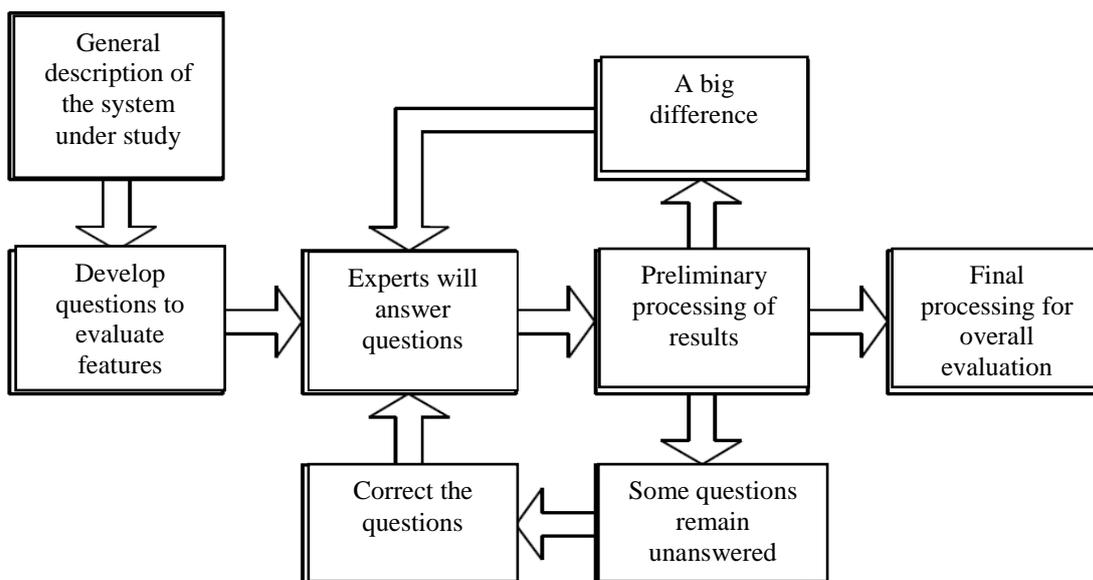


Figure 2. An algorithm for software training that intelligently analyzes the work of an expert group.

**V. EXPERIMENTAL RESULTS****Network data analysis process model in an automated control system**

Information systems existing and actively operating in the corporate network of automated management systems, protection of software product data processing based on intelligent analysis of data transmitted in the local network of tax authorities can be implemented in several stages [12].

**Algorithm:**

**Step 1.** Exploring the general and specific aspects of the object of control;

**Step 2.** Selecting or developing a mathematical model for analytical study of data flow;

**Step 3.** Collection and statistical analysis of data to be studied and classified from real-time automated control system software products;

**Step 4.** Database processing. Implementation of the developed model, verification of electronic digital signature, study of information accuracy and quality parameters (Figure 3);

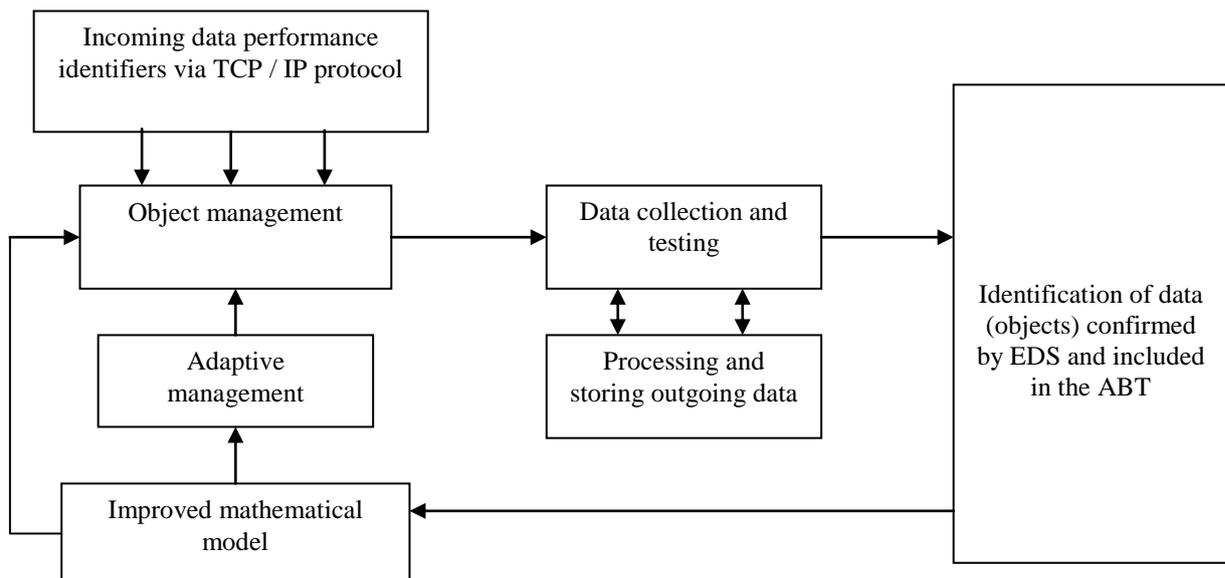


Figure 3. Describe the flow of information into a database.

**Step 5.** Identify a new mathematical model from the results of the studied software and information systems databases;

**Step 6.** Development of adaptive data management system;

The proposed intelligent software is based on a newly developed unique model and technologies created using a special algorithm. Primarily based on data processing server devices, software adequate to their database, ORACLE and MySQL database environment, OPC technology (OLE for Process Control) for data collection is established [7].

**VI. CONCLUSION**

Our research on the analysis of information flow in the automated management system of the tax authorities has led to the following conclusions:

- There are many databases in the management system, and there is a need for software that allows integration between them;
- The growing volume of data also requires improved processing systems;
- The use of the latest network technologies in the use of network protocols has a positive effect on the process of saturation of information flows.



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- We consider the use of intelligent data analysis modules in the management system to be effective in the processing of large data;
- it is necessary to organize the work process using all the capabilities of the standards in the management system, to further improve the corporate network programs;
- It is necessary to further accelerate the policy of information security in the management system, to create the possibility of using some services without digital signatures;
- We consider it expedient to further expand the audience of the portal's single interactive services for individuals and legal entities and individual entrepreneurs, to further modernize the mechanism for generating reports and making payments via the Internet;
- There is a need to develop a single software for the head of the State Tax Inspectorate in the authorization network, to integrate it into other information systems and software products, to eliminate problems in the document management system.

Summarizing the above, we can say that it is expedient to further modernize the level of integration of incoming and outgoing information flows into the database of the automated management system of the tax authorities, as well as to make additions based on a new approach. There is also a need to implement an approach that takes into account the relatively low level of intellectual management. This will have a positive impact on the level of automation in the tax system. As a result, there is an opportunity to increase economic efficiency and reduce human factors.

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