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METHODS OF IDENTIFYING THE SHADOW ECONOMY AND CORRUPTION USING INFORMATION TECHNOLOGY AND THE ADVANTAGES OF INFORMATION TECHNOLOGY IN COMBATING THEM

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Abstract: The article analyzes the "shadow economy and corruption", its dependence, formation and influence on state development, the role of information technology in the effective fight against the "shadow economy and corruption" is described, and the research conducted in this direction is analyzed, and the experience of foreign countries is a systematic analysis done Empirical-analytical, statistical, national legislative analysis and other research methods were also used in the research.

Key words: shadow economy, corruption, information technology, Markov chains, filter comparison.

Introduction. In the modern world, information technologies play a significant role in all aspects of life, making a worthy contribution to improving our daily lives by effectively using data, automating work processes, and ensuring communication and information security. In addition, information technology plays an important role in the effective organization of tasks and functions assigned to ministries and agencies and in improving the quality of public services provided to citizens.

Of course, due to the digitization of the tasks and functions assigned to them by ministries and departments, they have a large amount of data, and this data can be used not only in providing government services, but also in analyzing other sectors of the economy. In addition, ministries and departments will be able to automate the tasks and functions assigned to them by processing large volumes of data without human intervention.

First of all, it should be noted that there is no single internationally recognized tariff for the "hidden economy" and no precise methods for determining its scope[1]. The term "hidden

economy" is also used in the literature with various other terms such as "informal economy", "secret economy", "shadow economy", and others. Secret economic activity is mainly latent, i.e. hidden, and the methods of its implementation are constantly changing, becoming more complicated, and are carried out through various schemes. This means that they are difficult to identify and expose.

According to research conducted in this regard, corruption and the shadow economy are the main forces threatening economic security, and there is a close connection between corruption and the shadow economy, which have common roots in administrative barriers[2]. A high level of “shadow economy” in a country creates the basis for a high level of corruption.[3] In low-income countries, it has been found that the level of corruption increases with the size of the “shadow economy”[4].

There is also a positive correlation between the “shadow economy” and inflation, and a negative correlation with the tax burden.[5] Analysis of informal employment and the “shadow economy” shows that in developing countries the number of citizens in informal employment is greater than the number of citizens engaged in formal employment.[6]

The underground economy (secret economy) is an economic process or type of economic activity that is not openly carried out by its participants, is not controlled by the state and society, is not taxed, and is not recorded in official government statistics. The shadow economy is the process of production, distribution, exchange, and consumption of goods and services that cannot be observed openly, and is based on the interests of certain individuals or groups of individuals. The shadow economy exists in almost all countries of the world[7].

Corruption is the unlawful use of a person's official or service position to obtain material or non-material benefits for personal gain or for the benefit of other persons, as well as the unlawful provision of such benefits.

Corruption and the shadow economy are one of the main obstacles to economic and social development in many developing countries. Today, the role of information technology in combating these problems is increasing. Intelligent analysis of information bases through modern methods and algorithms remains one of the important tools in identifying and fighting corruption and the hidden economy.

Looking at the share of the shadow economy in Central Asian countries, the shadow economy in Uzbekistan is very large, accounting for approximately 30-50% of GDP. In neighboring countries, this figure is 20-40% in Kazakhstan, 40-50% in Kyrgyzstan, 30-40% in Tajikistan, and 30-40% in Turkmenistan. In the same way, the hidden economy in Russia is about GDP 20-25%, 8-10% in Japan, 7-10% in the USA, 10-12% in Germany, 10-15% in China.

The organization of the activities and control functions of state administrative bodies, administrative procedures, and corruption indirectly affect the formation of the "shadow economy." Leading researchers in this field have identified the 10 most important factors influencing the "hidden economy" as the tax burden, effective governance and corruption, regulatory and legal documents, public services, taxpayer behavior, preventive measures, the level of development of the formal economy, self-employment, unemployment, and the share of the agricultural sector in the economy[8].

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The Organization for Economic Cooperation and Development has recommended three main areas for reducing the share of the underground economy: educating taxpayers and simplifying compliance with the law, reducing opportunities for engaging in underground activities and increasing opportunities for detection, and strengthening social norms[8].

Today, it is necessary to pay attention to the following in determining corruption risks by comparing the databases of ministries and agencies and using modern information systems in the fight against the hidden economy.

1. Formation of databases in ministries and agencies;

Development of information systems and formation of databases based on the tasks and functions assigned to them by all ministries and agencies.

In this regard, developing a centralized digital strategy and development plan based on the tasks and functions assigned to ministries and departments, and preventing duplication of data types in the process of forming databases;

Use of single keys in the process of data formation by ministries and agencies;

2. Mutual comparison of formed databases.

There are several methods for comparing large amounts of data, including:

- Markov chains: use textual data to identify relationships between instances.

- Filter-based Comparison: data is first passed through filters and unnecessary data is removed. Then the comparison is performed.

- Value-based Comparison: comparing data based on specific values and metrics.

- Textual Data Comparison: using NLP (Natural Language Processing) and text mining techniques to identify similarities and differences between different text data.

- Sequence Comparison: comparing time series and identifying commonalities and variations in them.

- Image Data Comparison: using computer vision and image analysis algorithms to compare images and videos.

3. Develop a methodology for identifying risks of violations of the law by comparing large amounts of data.

Methodologies are developed by ministries and agencies to identify cases where there are risks of law violations based on their tasks and functions.

The following should be considered: - Quality and accuracy of data: Attention should be paid to the accuracy and reliability of the data.

- Data cleaning: Checking data for matching filters and masks. It is necessary to clean the data from errors, returns and empty cells, so that the accuracy of the results increases.

- Data sources and integration: Bringing together data from multiple sources to identify law enforcement risks and focusing on the single keys to the collected data.

- Comparison and analysis methods: it is necessary to select the most appropriate algorithms for analyzing data through comparison, which may include machine learning, transfer learning, statistical methods, and others.

- Cybersecurity and privacy: Security protocols must be taken into account when storing, processing, and analyzing data used in the process of identifying risks of violations of the law.

- Compliance with legislation and regulations: All processing processes and methodologies must comply with legislation and regulations.

- Verification and validation of models: The accuracy and reliability of the used models should be checked and validations should be used.

In addition, testing the models for correct and fast operation and improving their efficiency by studying the results in practice.

- Visualization and presentation of results: providing an easy understanding to the user by visualizing the identified law violation risks. Using graphs, charts and other visual aids.

- Preparation of reports: preparation of reports of identified, controlled and eliminated cases based on the results, presenting them to relevant officials.

- Implementation and monitoring: implementation of the identified methodology and regular monitoring of its effectiveness.

Conclusion. In order to identify the risks of corruption and to introduce modern information systems in the fight against the hidden economy, the following was suggested:

Eliminate excessive bureaucratic obstacles to establish information exchange between ministries and agencies, impose obligations on ministries and agencies to provide information based on the functions assigned to them.

The collected data will be analyzed without the human factor and only authorized users will be allowed to use it in order to eliminate the risks identified in violation of the law and control the elimination of risks.

In addition, committees should be established in all ministries and departments (without changing the main staffing level) to identify the risk of violations of the law, to check the quality of risk areas, and to develop ongoing proposals for identifying new risk areas and eliminating them. Prepare and submit to the republican working group detailed proposals to prevent future recurrences.

It should be noted that the above proposals were reflected in the Decree of the President of the Republic of Uzbekistan No. PF-100 dated July 10, 2024 "On additional measures to strengthen financial control over the use of budget funds" based on the mechanism presented below.

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Ўзбекистон Республикаси Президентининг
2024 йил 10 июлдаги ПФ-100-сон
Фармонига

4-ИЛОВА

Ўзбекистон Республикаси Ҳисоб палатаси томонидан «Масофавий аудит» ахборот тизими орқали тақдим этилган хавф (риск) таҳлилларни бошқариш

СХЕМАСИ

Босқичлар	Субъектлар	Тадбирлар	Муддатлар
1-босқич	Ҳисоб палатаси	Аниқланган риск-таҳлилларни «Масофавий аудит» ахборот тизими орқали тегишлича вазирлик ва идораларга юбориш	Уч кун муддатда
2-босқич	Вазирлик ва идоралар	«Масофавий аудит» ахборот тизими орқали юборилган риск-таҳлилларни қабул қилиб олиш ва ўрганиш юзасидан ижрога қаратиш	Уч кун муддатда
3-босқич	Вазирлик ва идоралар	Риск-таҳлилларни ўрганиш натижалари юзасидан «Масофавий аудит» ахборот тизимига ва ўрганиш якунлари тўғрисида маълумотларни «Давлат аудити» дастурий комплексига юклаш ва Ҳисоб палатасига юбориш	Ўн кун муддатда
4-босқич	Ҳисоб палатаси	Вазирлик ва идоралар томонидан юборилган риск-таҳлиллар бўйича ўрганиш натижаларини кўриб чиқиш (қабул қилиш ёки қайта ишлашга юбориш)	Бир ҳафта муддатда
5-босқич	Вазирлик ва идораларнинг «Хавфларни бошқариш» қўмиталари	Риск-таҳлиллар юзасидан ички аудит хизматлари томонидан амалга оширилган ишларни қўмиталар йиғилишларида муҳокама қилиш ва Ҳисоб палатасига ахборот бериш	Ҳар чоракда

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