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Implementation of Artificial Intelligence Technologies in Accounting and Taxation Based on Expert Assessment Methods

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Abstract:

This study focuses on the analysis of artificial intelligence (AI) applications in accounting and taxation, based on expert evaluations. A review of scientific literature has been conducted to explore the nature of artificial intelligence and to identify its core functions in this domain. Illustrative examples include software solutions such as Robotic Process Automation (RPA), RobBee accounting robots, and the DavrOn virtual assistant. The findings demonstrate that the adoption of AI and robotic technologies substantially contributes to the modernization of accounting practices and tax administration.

Introduction

Equipped with a high level of professional knowledge and skills, accountants can identify potential risks, develop measures to mitigate them, optimize taxes and expenses, and contribute to strategic planning. Accounting and taxation play a crucial role in the modern business landscape by providing a comprehensive understanding of an organization's economic activities, including data on its property and financial position. Accountants have evolved beyond their traditional roles, increasingly acting as strategic consultants, and helping management make informed financial decisions.

As a result, the accountant's zone of influence has grown, making them a strategic partner that helps organizations accomplish their long-term objectives while simultaneously ensuring adherence to legal requirements. The use of artificial intelligence in accounting and taxation procedures has gained increasing attention in light of the rapid digitization, the proliferation of remote work arrangements, and the rapid advancement of information technology. AI refers to the technologies developed to build intelligent systems that can carry out operations like data processing, forecasting, and decision-making that previously required human involvement.

In the midst of digital transformation, the combination of automation and artificial intelligence is opening up new possibilities to improve reporting accuracy, streamline accounting procedures, and reduce risks—all of which will ultimately boost accounting departments' productivity.

Given the speed at which science and technology are developing worldwide, rivalry for leadership in AI development has taken on significant importance. Numerous governments, including the United States, China, Japan, Australia, Brazil, Canada, Russia, and several European countries, are actively integrating AI technology and developing legislative frameworks for their governance.

Researchers including David Autor, Richard Susskind, Edward Felten, Michael Jordan, A. Spielman, A. Konushin, V. Malykh, A.A. Udalova, A.V. Sosnovskaya, and A.S. Andyka have all expressed interest in the incorporation of AI into tax systems. Scholars working in this field in Uzbekistan include S.S. Gulyamov, Sh. Mirzaev, U. Yuldashev, M. Kamilova, B. Salimov, S. Bekmurodov, Sh. Tursunov, and A. Abdugafarov. Their input is essential to expanding the use of AI in accounting and the tax system [1–8].

The emergence of digital technologies has had a profound effect on the economy and the accounting industry, changing conventional methods and business organizational structures. These modifications encourage the creation of new business models that require management procedures to be modified. However, there are some obstacles to overcome when integrating digital technology into accounting systems, including the complexity of handling massive amounts of data, skepticism about novel approaches, reluctance to change, and expensive implementation costs.

Technology has a significant impact in management accounting where data processing volume and complexity have increased. The widespread adoption of artificial intelligence is hampered by skepticism and high implementation costs, despite the obvious benefits, which include increased accuracy and efficiency in accounting procedures. According to research, small and medium-sized businesses are also investigating ways to include AI, such as automating data collection through accounting systems, proving that the usage of AI is not just confined to giant firms. Economists emphasise how AI may improve accounting procedures, especially in the area of taxes. The use of AI technologies enhances reporting accuracy, decreases human error, and boosts accounting systems' overall effectiveness.

Implementing AI-based software solutions allows companies to adapt to modern technological demands, thereby enhancing their competitiveness. Therefore, artificial intelligence technologies hold immense potential for transforming accounting processes. Further exploration and integration of these technologies into organizational activities are essential steps toward fully digitizing accounting and taxation, as well as improving audit systems [9-14].

MATERIALS AND METHODS

The novelty of the research. This study explores new approaches to simplifying the tax system, incorporating modern tax control tools, and utilizing artificial intelligence in accounting and taxation through expert assessments. However, despite adhering to all regulatory rules and technologies at the operational stage, digital technologies in the tax system and interactive public services significantly lag behind international standards in terms of quality and durability. This discrepancy indicates that our technologies and regulatory documents may either be outdated or do not align with local specifics.

It is important to note that the successful preparation of project documentation often relies on the structures that actively participate in the process. Corruption within the tax interactive services system occurs subtly and is challenging to detect. Nonetheless, uncovering corruption in the tax system requires a thorough and objective analysis of the outcomes of the services provided and the work performed. We believe that a major issue stems from the excessive ambition of corrupt officials who leverage the lobbying of competing companies for personal gain during the implementation of digital technology projects in the tax sphere. As a result, the costs of introducing these digital technologies into the tax system and interactive services are rising, while the quality and reliability deviate significantly from established standards.

One of the key aspects of such projects is the accurate accounting of actual costs and operational timeframes. We propose a new "bottom-up" approach for introducing modern digital technologies and artificial intelligence into the tax system of Uzbekistan, based on expert assessments. This method emphasizes the gradual integration of contemporary methods, programs, and communication technologies into the tax system's framework. Throughout the implementation process, it is essential to comply with the regulations of the State Tax Inspectorate and to conduct a state examination.

Qualified experts and specialists are necessary to thoroughly assess and analyze the effectiveness of integrating modern digital technologies into the tax system. At each stage of digitizing tax system projects, a sample survey of experts is conducted. These experts should possess a substantial amount of objective and valuable information in the field of taxation, making them vital sources of both qualitative and quantitative data.

Initially, working groups and expert groups are formed to adopt the expert approach. The working group is responsible for collecting and analyzing questionnaires containing expert assessments to monitor the survey process. Subsequently, the expert group calculates the total score for each factor, evaluating the overall score using significance coefficients for each factor.

In this instance, the questionnaire was developed to survey knowledgeable experts in the city of Samarkand for 2023. The survey involved leading specialists in tax legislation and modern digital technologies. The questionnaire consists of 10 questions, which over 12 experts rated on a 10-point scale. Each expert assessed the relevance of the problem from 1 to 10, with 10 indicating the most significant issue and 1 indicating the least significant. [5-16]

The questionnaire includes the following relevant questions:

1. How would you evaluate the effectiveness of modern digital technologies and programs implemented in the tax system and accounting?

2. What is your opinion on conducting selective surveys of experts regarding the transparency of tax and accounting laws?

3. How satisfied are you with the quality of interactive public services provided by the solig.uz website and the my.solig.uz portal?

4. How do you assess the competence of tax service managers and the knowledge of tax service employees?

5. Does the overall tax burden in the Republic of Uzbekistan (currently at 27%) meet your expectations?

6. What is your attitude toward tax penalty rates for violations of tax laws?

7. What is your opinion on the gradual reduction and optimization of the number of taxes and other mandatory payments?

8. How do you evaluate the work of the coordination council regarding planned tax audits of individuals and legal entities in Uzbekistan?

9. Do you believe that improving the quality and expanding the availability of electronic government services will significantly reduce corruption levels?

10. Do you think there is corruption within the tax structures of Uzbekistan?

Digitalization and artificial intelligence in tax administration and taxation systems are crucial for modern economic development. The introduction of modern digital technologies and AI-based programs significantly enhances the monitoring of the tax burden on businesses and reduces the time spent on transactions between taxpayers and tax authorities. The gradual implementation of these digital innovations, as evaluated by experts, is relevant and necessary for effective control over the operations of the tax service and the processing of citizens' appeals. [4-17]

RESEARCH ANALYSIS

The expert evaluation method is crucial in enhancing the efficiency of management systems within tax structures. This study investigates the effectiveness and quality of modern tax control tools and the application of artificial intelligence in accounting and taxation through expert assessments. This method is especially relevant in scientific research, where quantitative analysis and evaluation methods may be limited or reliable information about current reporting is lacking.

When examining research factors, experts often face disagreements on complex issues, highlighting the need to quantify the level of agreement among them. Establishing a measure of consistency allows for a clearer understanding of the reasons behind differing opinions. Below, the most commonly used methods for processing and presenting data are described. These methods can be applied to any set of primary statistical data.

Table 1 showcases the scores assigned by 12 experts based on a questionnaire consisting of 10 questions. These responses were collected from various organizations, including private, state, and public entities, for the 2022 reporting year in Samarkand.

TABLE 1: Expert scoring assessment of factors

Factors	Experts												Sum ranks	Deviation from the average sum of ranks	The squares of deviations of the sum of ranks
	1	2	3	4	5	6	7	8	9	10	11	12			
1	4	3	4	3	3	4	3	3	3	3	4	4	41	-36	1296
2	3	4	5	4	3	3	4	3	4	4	4	3	44	-33	1089
3	5	4	3	5	4	4	4	3	4	3	3	4	46	-31	961
4	3	4	3	3	4	5	5	3	4	3	5	4	46	-31	961
5	7	9	9	8	9	7	6	8	9	7	9	8	96	19	361
6	7	7	9	7	9	7	8	9	7	9	7	9	95	18	324
7	8	9	7	9	7	9	8	7	9	7	9	7	96	19	361
8	8	8	8	9	8	9	8	9	9	8	8	8	100	23	529
9	8	9	8	8	9	9	8	9	8	9	9	9	103	26	676
10	9	9	8	9	9	8	8	9	8	9	7	9	102	25	625
TOTAL	62	66	64	65	65	65	62	63	65	62	65	65	769	-	7183

The processing of the assessments begins after the data from the experts have been collected. The data are summarized, and average values for each set of S_j-questions are calculated. To establish a quantitative evaluation of the factors, a simple ranking method is employed. Table 1 provides a general overview of the results compiled into a single table. The consolidated expert opinion is obtained using mathematical statistics, and the average rank of each factor, or the mean statistical value of S_j, is determined.

$$S_j = \frac{\sum_{i=1}^{n} a_{ij}}{m_j} \quad (1)$$

S_j is the average value of the factors.

a_{ij} is the expert's assessment of the j-factor.

m_j is the number of experts evaluating the j-factor.

i - is the expert's number.

j – is the factor's number.

The next step is to determine the average rank of the set of factors in the research

$$\bar{S} = \frac{\sum_{j=1}^{n} S_j}{n} \quad (2)$$

The next step is to calculate the deviation of the average rank of the d_j-th factor from the average rank of the set of factors

$$d_j = \bar{S} - S_j \quad (3)$$

Table 1 presents the results of the calculation of actual data. Determining the consistency of expert opinions was an important part of the study. For this purpose, the concordance coefficient K was calculated using the formula

$$K = \frac{12 * \sum_{j=1} d_j^2}{m^2(n^3 - n)} \quad (4)$$

The obtained values allow for the calculation of the concordance coefficient and enable the conclusion of the degree of agreement among expert opinions based on the Cheddock scale (Table 2).

$$K = \frac{12*7183}{12^2(10^3-10)} = \frac{86196}{142560} = 0{,}61.$$

The obtained value of 0.61 is close to one, indicating a notably high level of agreement among expert opinions. This value of the concordance coefficient suggests that the experts' opinions are consistent, and therefore, the quality of the assessment can be considered significantly high. The strong consensus among experts reflects the reliability of the data obtained. As a result, the assessment process effectively identified the most modern and effective methods for integrating digital technology into the tax structure. [4-12].

TABLE 2: The Chaddock scale for evaluating the coherence of professional judgements

Quantitative measure of correlation strength	Qualitative characterization of bond strength
0,1 - 0,3	Weak
0,3 - 0,5	Moderate
0,5 - 0,7	Noticeable
0,7 - 0,9	High
0,9 - 1,0	Very high

Based on observations from Samarkand, the outcomes of expert evaluations show a favorable judgment of the caliber and efficacy of contemporary tax control instruments as well as the use of artificial intelligence (AI) in accounting and taxation. An expert approach is the most appropriate and successful way to keep an eye on the calibre of interactive services offered by tax authorities, according to a statistical study of the level of digital technologies and AI deployment today.

We suggest utilizing this expert technique to update Uzbekistan's tax rules and regulations in light of the data and expert evaluations acquired. Additionally, the following specifications and suggestions must to be taken into account at every level of integrating digital technologies and artificial intelligence into the tax system and its interactive services:

- engage skilled professionals in the application of AI and contemporary digital technologies.
- streamline information flows, consolidate tax data, and fortify information system cybersecurity.
- provide taxpayers with engaging, transparent, and high-quality public services.
- examine other nations' experiences to develop new guidelines and norms for the digital technologies in tax systems comply withse of AI and digital technology.
- make sure that the use of digital technologies in tax systems complies with both national and international quality requirements.
- create new guidelines and standards for the usage of digital technology based on international best practices.
- improve the caliber and efficacy of digital technology investments for tax system projects.
- encourage the expansion of creative businesses that are constructing the nation's digital infrastructure.

- provide suggestions for market-based techniques that take into account the resources at hand to assess how well digital technology is being implemented.

- incorporate sophisticated tax computation techniques into the worldwide information system.

There is a lot of promise in using contemporary techniques to integrate AI and digital technologies into the tax code. An essential part of the economy is the tax system, and in the modern world, it is critical to start the process of carefully digitizing this area. This viewpoint is supported by the social significance of taxes as well as a number of political and economic considerations. Enhancing social security, improving the quality of decisions, and expanding monitoring of tax system services are all possible with a single information and calculation center.

AI can increase productivity by streamlining repetitive operations without taking the place of experts' professional knowledge and abilities. AI has the ability to drastically change accounting procedures, improving their accuracy and efficiency. Its use in the tax industry presents opportunities to streamline taxation processes, enhance taxpayer services, and automate and optimize daily operations. These programs seek to establish a transparent and safe environment where advancements in accounting and taxation are in line with safeguarding the public interest. The ultimate goal of these initiatives is to create a cohesive infrastructure that facilitates AI's effective integration as a vital component of innovation and sustainable economic growth. [5–13]

Therefore, the integration of artificial intelligence into Uzbekistan's tax system holds great promise for improving the efficiency, transparency, and modernization of tax administration. These developments are especially crucial for modernizing and improving the Republic of Uzbekistan's tax administration. [12-25]

CONCLUSION

By guaranteeing high accuracy in calculations and projections and enhancing decision-making processes through data analysis, the incorporation of AI into accounting platforms dramatically decreases the regular effort for specialists. These tools provide businesses more control over their financial processes, reduce errors, and save time. In addition to improving efficiency and production, the employment of software robots in accounting gives workers new options and frees them up to concentrate on more important work.

The use of these technologies is becoming essential in today's approach to accounting and financial management, and it lays the groundwork for firms to undergo even more digital transformation. With the advent of virtual robot accountants, businesses can use more adaptable automated solutions to replace workers performing repetitive tasks. Increased productivity results from this change, which also makes it possible to focus human resources on strategic and analytical work related to the tax system.

These developments boost businesses' financial stability and set the stage for major advancements in data management. Financial limitations, the difficulty of some tasks, AI's limitations in terms of creativity and intuitive decision-making, and the requirement for manual intervention to configure algorithms and analyze intricate intra-holding calculations that current technologies cannot handle are some of the reasons why complete automation of accounting is still unattainable.

In order to create more sustainable and effective financial systems, accountants and artificial intelligence will work together in the future to combine routine process automation with human

intuition and expertise. It is crucial to understand that rather than totally replacing specialists, AI should be used as a tool to improve their work. The human element is still crucial, particularly when it comes to strategic decision-making and innovative methods.

On the basis of the analysis, current issues have been recognized, and solutions to enhance the use of AI in accounting and tax accounting have been suggested. As a result, integrating AI into the tax and accounting systems is both a technological advancement and a societal problem. Combining innovations with professional experience and highly skilled specialist training is essential to successfully addressing this challenge and laying the groundwork for the industry's long-term growth in the Republic of Uzbekistan. [9-16]

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