

# ARTIFICIAL INTELLIGENCE AND TAX ADMINISTRATION IN BULGARIA

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## **Abstract**

*This report explores the transformative potential of Artificial Intelligence (AI) technologies in tax administration in Bulgaria, with a focus on bridging the gap between existing tax fraud detection tools and the incorporation of business characteristics, such as abnormal financial status. It underscores the importance of integrating AI technologies to harmonize both structural and financial characteristics in tax fraud detection. The report presents a critical overview of existing tax fraud detection tools, deriving key insights on how such technologies can be improved.*

**Key words:** integration of AI, tax administration, tax fraud

## **Introduction**

Artificial Intelligence (AI) has emerged as a transformative force across various sectors, revolutionizing the way businesses and governments operate. In the context of tax administration, AI has the potential to streamline processes, enhance efficiency, and improve compliance, thereby contributing to the economic growth and stability of nations. In recent years, the Bulgarian tax administration bodies, predominantly the National Revenue Agency (NRA), have recognized the significance of digitalization, but the implementation of AI technologies remains a complex process which is still due.

The integration of AI into tax administration not only promises to increase revenue collection but also to simplify complex taxation processes, minimize errors, and foster a climate of transparency and trust between the government and its citizens.

This report aims to provide an overview of how different AI technologies are implemented in different tax administration bodies around the world. It explores the difficulties of such implementation and proposes a tool for enhancing tax fraud detection.

## **Research gap**

This report serves as a critical bridge over an existing gap in the current landscape of tax administration and fraud detection. Presently, the tools and methodologies employed for detecting tax fraud predominantly focus on structural characteristics, such as the organization's structure or transactional patterns. While these aspects are undoubtedly essential for identifying potential irregularities, they often fall short in capturing a more holistic view of tax fraud. This limitation becomes glaringly evident when one considers the inherent dynamism and adaptability of fraudulent activities in the modern economic landscape.

The gap that this report addresses centers around the need to incorporate the business characteristics of tax fraud, specifically factors like abnormal financial status, into the detection process. Traditional methods may not sufficiently recognize signs of tax evasion or fraud that are *rooted in the financial* health or behavior of an entity. Such behaviors may include abnormal fluctuations in revenue, expense patterns, or financial ratios that deviate from industry norms and benchmarks.

By delving into this critical gap, this report seeks to shed light on how Artificial Intelligence can be harnessed to bridge the divide between structural and business characteristics in tax fraud detection. AI technologies have the capacity to analyze vast and complex financial datasets, identifying anomalies

and patterns that human auditors might overlook. By taking into account abnormal financial status alongside structural information, AI-powered solutions have the potential to revolutionize tax administration, providing a more comprehensive and accurate assessment of potential fraud.

## **Literature review**

The use of AI in tax administration can have significant benefits. It can improve taxpayer compliance by incorporating information and communication technology (ICT) into the tax administration system (Djafri et al., 2023). The application of e-tax systems, AI, chatbots, and biometric identification can streamline processes such as registration, filing, payment, and identification, making it easier for taxpayers to comply with their obligations (Djafri et al., 2023). Additionally, AI can be used to monitor entrepreneurial activity and identify cases of tax evasion, both by regulatory authorities and by entrepreneurs themselves.

Furthermore, AI can contribute to macroeconomic stability and economic growth. Tax administration reforms, including the integration of AI, can address challenges such as low tax revenue and corruption in the tax bureaucracy (Herbert et al., 2018). By improving tax policy and administration, AI can help generate higher tax revenue and reduce opportunities for corruption, leading to economic stability and growth.

Artificial intelligence (AI) has the potential to revolutionize tax administration by improving efficiency, enhancing tax collection and management, and reducing tax evasion. Several studies have explored the application of AI in tax administration and its impact on various aspects of the tax system.

Zhang (2023) suggests that the construction of an AI-based environmental protection tax system can improve tax collection and management, tax payment service, and tax management (Zhang, 2023). By leveraging AI technology, tax authorities can optimize the design of the tax system and enhance the efficiency of tax administration processes. This can lead to more effective tax collection and a reduction in tax evasion.

Another study highlights the digitalization of tax administration communication as a result of AI technology (Ihnatišínová, 2021). AI creates new digital communication channels, enabling more efficient and paperless tax administration. This can streamline communication between taxpayers and tax authorities, leading to faster and more accurate processing of tax-related information.

Furthermore, the integration of AI technology and tax risk management can establish an intelligent tax system (Huang & Zhang, 2022). By using AI algorithms such as Bagging and Support Vector Machines (SVM), tax authorities can analyze large volumes of data to identify potential tax risks and anomalies. This can help in detecting tax evasion and improving tax compliance.

Jiang (2022) presents an intelligent tax planning platform based on the current situation analysis, and proposes a new tax planning algorithm based on the advanced technology of big data and artificial intelligence, which helps enterprises to carry out intelligent tax planning under the premise of legal compliance, reduce company labor costs, and increase the freelancers' revenue.

However, there are certain challenges that need to be addressed when implementing such technologies. One such challenge is the need for administrative capacity and accountability. Studies have shown that countries like Bulgaria and Romania face obstacles in terms of administrative capacity and accountability, which can hinder the successful implementation of reforms, including those related to AI (Wegener et al., 2011). Therefore, it is crucial for Bulgaria to address these challenges and build a strong administrative foundation to support the integration of AI in tax administration.

To fully harness the potential of AI in tax administration, Bulgaria should consider the experiences and best practices of other countries. In the following section, we provide several examples of successful implementation of AI technologies in tax administration processes.

## **Examples of implementation of AI in tax administration**

The government of Malta has implemented a system which alerts the authorities when a tax payer's income does not correspond to the value of assets in his possession (Zammit, 2023). While a good example of combating tax fraud and money laundering, this case poses the question of personal rights and security.

The Canadian government has announced TaxGPT (<https://taxgpt.ca/>), a chatbot which assists taxpayers in the process of understanding and filing their income returns. Of course, relying solely on a chatbot to do your taxes is never a good option, but it is still a great support tool.

The Netherlands also implemented a self-learning algorithm which categorizes citizens into risk groups in effort to stop childcare benefits fraud. It is also a good example of how terribly bad such implementation can go if not done right. Thousands of Dutch families have been wrongfully categorized and punished over the years which led to a need for revision of the tool. (Goujard and Manancourt, 2022). Such system has been successfully implemented in Italy.

Australia claims to have identified over \$530 million in unpaid tax bills and prevent \$2.5 billion in fraudulent claims using AI models, including deep learning and natural language models.

China has implemented reforms in tax collection and administration, using AI and blockchain technology to reshape its core processes (Wang & Chen, 2018). Similarly, Russia has utilized AI in the tax sphere to identify cases of tax evasion and ensure compliance.

By studying and adapting the successful approaches, Bulgaria can develop a comprehensive strategy for integrating AI into its tax administration system.

## **Challenges in implementing AI in the Bulgarian tax administration**

There are several non-neglectable challenges in implementing AI technologies in the tax administration process in Bulgaria.

Wegener et al., 2011 presents the need for administrative capacity and accountability so that reforms can be pushed through successfully. As he goes to show, Bulgaria and Romania did not have that capacity then. The country's political and socioeconomic transformations are still unfinished, which hinders the adequate completion of the Europeanization process (Wegener et al., 2011). These challenges can impact the implementation of AI in tax administration, as they require a strong administrative capacity and a robust accountability framework.

Another issue is lack of infrastructure and technology. Upgrading and modernizing existing IT infrastructure to support AI implementation can be costly and time-consuming. This includes procuring powerful hardware, software, and networking resources. Moreover, integrating the complex AI systems with the already in-place legacy systems require skillful professionals in the field. This leads to the next issues – skill gap.

Building a team with the necessary AI expertise can be challenging. Recruiting and training data scientists, machine learning engineers, and AI specialists may require significant effort. In addition to that, they also must be skilled in tax, audit, and accounting which makes the task even harder.

As we saw in the aforementioned examples, ethical considerations are always an issue which has to be taken care of. Tax administration AI systems must be designed with ethical considerations in mind, avoiding bias in algorithms and ensuring fairness in decision-making are crucial aspects for people to trust the technology. Building and maintaining public trust in AI-powered tax administration is critical. Ensuring that the public understands how AI is being used and its benefits is important for acceptance.

To successfully implement AI in the Bulgarian tax administration, a comprehensive strategy that addresses these challenges is essential. This strategy should involve collaboration among stakeholders, including government agencies, IT experts, data scientists, and the public, to ensure that AI systems are effective, transparent, and trusted.

## Conclusion

The implementation of AI in tax administration in Bulgaria holds immense potential for transforming the efficiency, effectiveness, and transparency of the country's tax system. This report has explored the various facets of integrating AI into tax administration, highlighting both the opportunities and challenges associated with this endeavor.

Bulgaria, like many other countries, faces significant challenges in modernizing its tax administration system. The complexities of tax laws, the need for efficient revenue collection, and the demand for improved taxpayer services all converge to create a pressing need for innovative solutions. AI technologies, including machine learning, data analytics, and automation, offer a promising path forward.

As Bulgaria progresses in its journey toward AI-driven tax administration, it is imperative that the government and tax authorities collaborate with technology experts, data scientists, and other stakeholders. This collaboration will help in building a strong foundation for AI implementation, ensuring that it aligns with the unique needs and requirements of Bulgaria's tax system.

In conclusion, embracing AI in tax administration is not only a technological improvement but also a strategic necessity for Bulgaria. By harnessing the power of AI, Bulgaria can create a more efficient, fair, and taxpayer-friendly tax system that not only bolsters revenue collection but also enhances the overall economic and business environment in the country.

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