

THE USE OF DIGITAL TECHNOLOGIES AND ARTIFICIAL INTELLIGENCE IN IMPROVING TAX COLLECTION EFFICIENCY IN IRAQ

O USO DE TECNOLOGIAS DIGITAIS E INTELIGÊNCIA ARTIFICIAL PARA MELHORAR A EFICIÊNCIA DA ARRECADAÇÃO DE IMPOSTOS NO IRAQUE

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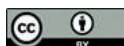
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Abstract

It is no secret that the taxation system used in Iraq has been languishing in a great deal of challenges because of poor revenue collection, high rates of tax evasion and not to forget the continued adopting of what is now considered outdated ways of financial management. And because of what we see as from rapid development in the arenas of artificial intelligence and digital transformation technologies worldwide, there does come up a pressing need for a comprehensive reform of tax collection mechanisms. This reform takes the form of using advanced digital systems that can further transparency and at the same time bridge any compliance gaps. In this current study, we tried to investigate the role of modern technologies and how they can take the efficiency of tax collection in Iraq to the next the country so desperately needs. In doing so, it juxtaposes successful experiences from other countries in the world so as to propose practical ways for their applying them within the Iraqi institutional context. As a methodology, we follow an

Resumo

Não é segredo que o sistema tributário utilizado no Iraque tem enfrentado grandes desafios devido à baixa arrecadação de receitas, aos altos índices de sonegação fiscal e, principalmente, à contínua adoção de práticas de gestão financeira consideradas obsoletas. Diante do rápido desenvolvimento da inteligência artificial e das tecnologias de transformação digital em todo o mundo, surge uma necessidade premente de uma reforma abrangente dos mecanismos de arrecadação de impostos. Essa reforma se concretiza por meio da utilização de sistemas digitais avançados que possam aumentar a transparência e, ao mesmo tempo, sanar as lacunas de conformidade. Neste estudo, buscamos investigar o papel das tecnologias modernas e como elas podem elevar a eficiência da arrecadação de impostos no Iraque a um novo patamar, algo que o país tanto necessita. Para tanto, comparamos experiências bem-sucedidas de outros países, propondo formas práticas de aplicá-las no contexto institucional iraquiano. Como metodologia,



admixture of a descriptive analytical and comparative approach in which we assess such experiences namely those of France, India, the UAE, and Egypt. We then put them in comparison with the legislative and administrative state-of-affairs in Iraq. The results we obtained from the study suggest that the most visible obstacles to digital transformation can be described as the dearth of financial legislation and there is also no unified database that can be relied on in addition to the fragile state of the technical infrastructure in the country. However, we can recommend updating tax laws and enacting a personal data protection law as solutions towards bridging this gap. Moreover, we recommend adopting invoices and electronic signatures as these are vital necessities today for securing the reform the country anticipates to achieve. Lastly, we also call for more attention to the paramount importance of qualifying the relevant staff and providing them with advanced digital skills in this regard.

Keywords: Artificial Intelligence. Digital Transformation. Tax Collection. Financial Reform in Iraq. Smart Tax Management.

adotamos uma abordagem que mescla análise descritiva e comparação, avaliando experiências da França, Índia, Emirados Árabes Unidos e Egito. Em seguida, comparamos esses dados com a situação legislativa e administrativa do Iraque. Os resultados obtidos no estudo sugerem que os obstáculos mais visíveis à transformação digital podem ser descritos como a escassez de legislação financeira e a ausência de um banco de dados unificado e confiável, além da fragilidade da infraestrutura técnica do país. No entanto, recomendamos a atualização das leis tributárias e a promulgação de uma lei de proteção de dados pessoais como soluções para superar essa lacuna. Além disso, recomendamos a adoção de faturas e assinaturas eletrônicas, pois são essenciais para garantir a reforma que o país almeja. Por fim, também destacamos a importância fundamental de qualificar os profissionais relevantes e capacitá-los com habilidades digitais avançadas nesse sentido.

Palavras-chave: Inteligência Artificial. Transformação Digital. Arrecadação de Impostos. Reforma Financeira no Iraque. Gestão Tributária Inteligente.

1 INTRODUCTION

There is no doubt that taxation has come up as a vital asset for all the countries when it comes to achieving their financial and social stability. This is because taxation is no longer a matter of serving as a source of revenue only. Its role has indeed become bigger as it is now viewed as a way to do a series of functions such as presiding over economic activities and operations, and also a way to share wealth among people, and not forget its role in encouraging growth. The taxation system used in Iraq is in fact beset by series of drawbacks such as its fragile state in terms of performance and also it is not keeping in line with the technological advancements we see today. One can only expect underwhelming results in the midst of this state of affairs such as underwhelming collection rates. Not only this but we can also refer to a spike in the size of the country's informal economy in addition to cracks in the citizens' confidence in the tax administration used. However, on the opposite side of the coin, one might reasonably contend that numerous countries, some of which are reviewed in this study, have made strides in successfully adopting AI and digital transformation technologies championed

today when it comes to managing their taxes. The evidence marshalled here is a number of improvements testify to the effects of such implemented technologies as everything ran more smoothly. Also, accuracy got much better and people complied more willingly to the policies used.

In the grand scheme of things, we believe that this study takes its importance from the fact that taxation stands for a reform tool that can generate some concrete results especially if it is gradually and thoughtfully used within the legal and institutional framework of the country.

In this study, we tried to highlight the potential advantage of applying these technologies. We also analysed the factors that deter securing effective digital transformation. In this pursuit, we reviewed comparative studies and international experiences with the aim of providing a composite vision for tax collection reform in the research site of the study, i.e. Iraq.

2 WHY THIS STUDY

When we came to formulate a rationale for this study, we found it is imperative to clarify the importance of attending to a two-fold issue pertaining to taxation. On the one hand, we put under our radar the financial reform so urgently needed in Iraq especially against the backdrop of the sharp decline in revenues generated from non-oil channels. On the other hand, we found it is also imperative to address technical transformation as a means of boosting efficient implementation of taxing system and achieving tax justice.

We also contend that this topic provides further rationale for conducting it as it contributes towards a much-needed shift in Iraqi tax thinking. This aspect particularly contributes to providing modern rather than outdated solutions in order to maximize public revenues, minimize tax evasion, and widen the taxpayers base thanks to taking advantage of modern technological tools. We might also claim that our study gives an academic and analytical dimension to the theme of digitization and artificial intelligence of taxation. Specifically speaking, we link the discussion to existing challenges witnessed around the world and we also enrich the discussion, in comparative capacity, practical models from successful regional and global experiences.

we come up with some recommendations where we assert that, in order to gain transparency and financial efficiency, using AI capabilities in the taxation system is no

longer an option but a necessity. We specifically stress the need for suitable legislative reform and sustainable institutional capacity.

3 PROBLEM STATEMENT

When we think about this topic and try to put it into words that capture what we are really asking here, one might express it in a question that helps us understand the core issue of taxation addressed here. The question we need to ask ourselves is this:

How much can using digital technologies and artificial intelligence systems actually help in rendering the process of collecting tax revenues more efficient and effective in the country of Iraq? And at the same time, when we look at the country's current situation on the ground, what are the specific obstacles and difficulties and challenges that stand in the way of these modern technological tools from being employed in a truly effective fashion in this country and its current institutional body and frameworks?

And a number of sub-questions arise from this problem, most notably:

- 1- What are the most prominent shortcomings in the Iraqi taxation system at the level of collection?
- 2- What AI tools are applicable in this field?
- 3- How can these tools be applied to the Iraqi administrative and legislative arenas?
- 4- What are the envisaged obstacles to implementing tax digital transformation, and how can they be sorted out?

4 RESEARCH HYPOTHESIS

The current study sets off in its quest on the basis of assessing the following main hypothesis:

- It is hypothesised in the current study to find improvement in administering and collecting taxation in Iraq thanks to the use of AI tools and digital transformation, provided that appropriate infrastructure, supporting legislation, and institutional will are available to bring this transformation to fruition.

Several sub-assumptions arise from this hypothesis. These can be formulated as follows:

- It is hypothesised in the current study that digital integration and analysis of databases can minimize tax evasion amongst taxpayers.
- It is further posited that automating invoices and declarations can heighten the popularity of tax compliance within the taxation system.
- It is also posited that in order for digital transformation to succeed, it requires legislative, administrative and societal consensus to bring this transformation to fruition effectively.

5 RESEARCH METHODOLOGY

As methodology, we opted for an analytical descriptive approach in which we formulated the conceptual and technical framework of tax collection and artificial intelligence. On the other hand, we relied on the comparative approach when we reviewed and analysed the leading international experiences in this field.

We collected the data we needed through a review of a series of channels which included academic literature, recent studies, and reports from international organizations such as (OECD, IMF, World Bank) as well as official documents of tax authorities in Iraq and other countries. Each part of the research has been documented based on published and reliable sources and the purpose here was to ensure scientific accuracy and balance in the presentation.

6 STUDY OUTLINE

Chapter I: 1. Conceptual Framework for Tax Collection and Modern Digital Technologies

Section 1: Tax Collection: Concept and Role in Fiscal Policy

Section 2: Digital Technologies and Artificial Intelligence in Tax Administration

Chapter II: The Reality of Tax Revenue in Iraq and Opportunities for Its Development through Artificial Intelligence

Section 1: Challenges to Efficiency of Tax Revenue in Iraq

Section 2: Opportunities for Developing Tax Revenue in Iraq Using Artificial Intelligence

1. Conceptual Framework for Tax Collection and Modern Digital Technologies

In this section, we lay the basic foundation that the research is built on so we can understand the relationship we envisage to find between tax collection and modern digital developments. It is important to note here that knowing the basic ideas and working parts of tax collection in fiscal policy is indispensable if we are to understand the real problems that stand in the way of taxation systems, especially in developing countries (Al-Saeed, 2022, p. 112).

It is also important to mention here that looking at the digital transformation that artificial intelligence brought to the fore has given us a better understanding of the technical possibilities available for taking taxation performance and efficiency to the next level.

6.1 Tax collection – concept and role in fiscal policy

As a concept, Rasheed (2015, p. 79) finds that Tax collection in its own right is the building block that supports financial system of any country, and it is also the executive part of tax legislation (ibid). We agree with Rasheed here that this topic has now proved essential as we are witnessing economic challenges in many countries. It is our aim here to clarify the exact concept of tax collection, its various forms, and then to clarify its position within the instruments of fiscal policy, and its role in achieving economic stability and social justice.

6.1.1 Concept and types of tax collection

Tax collection can be viewed as the entire set of administrative procedures taken by the tax authorities in the country in order to reap taxes due on both individuals and institutions. This set of procedures includes receiving declarations, auditing them, estimating obligations, and following up on payment or forced collection. It is worth noting that this operational aspect represents the cornerstone of the overall success of the taxation system as poor collection would pose a major impediment to achieving fiscal policy objectives (Al-Shaawi, 2021, p. 33).

It is also worth noting here that the Al-Qahwaji (2016, p. 45) pointed out that tax collection is “the procedural framework under which the legal obligation to pay tax is transformed into a tangible financial reality in the state treasury.” We can also here refer to Rasheed’s view (2015, p. 122) who believes that the efficiency of collection is directly related to a number of factors such as the extent of the comprehensiveness of the taxation system, the fairness of application, and the availability of electronic control mechanisms that limit evasion (ibid).

Taxes are generally divided into two basic types: direct taxes, levied on income or wealth (such as income tax), and indirect taxes, which are levied on consumption or transactions (such as sales tax or customs). The method of collection varies between the two types, as the direct type is more complex and vulnerable to evasion, while the indirect one is often obtained through commercial intermediaries as part of the final price of the good or service.

In Iraq, tax collection still suffers from the fragility of the administrative and regulatory system where most operations are based on paper files and manual archives. This comes amidst the absence of unified and comprehensive databases for all taxpayers, which increases the chances of corruption, and undermines the effectiveness of financial control.

6.1.2 The role of tax collection in fiscal policy

When it comes to implementing fiscal policy, tax collection comes in pivotal as one of the necessary tools for this process with the efficiency of tax collection is linked to the ability of the state to implement its economic and social programs. Collection cannot be separated from the achievement of tax justice, nor from a State’s ability to finance its operational and investment expenditures without resorting to borrowing or excessive reliance on natural resources (Obaid, 2021, p. 90).

The Organization for Economic Co-operation and Development (OECD) confirms that the effectiveness of collection is one of the main indicators of the efficiency of public administration, and that countries, that suffer from weak collection, are beset by chronic fiscal deficits, and high rates of tax evasion, a situation which leads to erosion of confidence in the state (OECD, 2022, p. 33).

In Iraq, the contribution of tax revenues to GDP is still very small, as it did not exceed 1.5% according to the Ministry of Finance's 2022 report, which reflects a large gap in actual collection compared to financial targets (Ministry of Finance of Iraq, 2022, p. 18). If we are to achieve effective collection, this by no means depends solely on taxation, but it needs an administration capable of monitoring economic activities, detecting evasion, and activating voluntary compliance. This in turn cannot be achieved without a strong digital structure and coherent legislative regulation.

6.2 Digital technologies and artificial intelligence in tax work

With the increasing complexity of economic processes and the expansion of the volume of data in circulation, artificial intelligence and modern digital technologies have become essential tools for managing financial systems, especially in the tax field. It is no longer possible to rely on paper methods or traditional procedures to keep pace with the volume of exchanges and the speed of business activities, especially in light of the expansion of e-commerce and the spread of the informal economy.

This section aims to demonstrate the basic concepts of artificial intelligence and digital technologies, and then present their modern applications in the tax field, especially in countries that have successfully integrated them effectively into their financial system.

6.2.1 The concept of artificial intelligence and digital technologies

Artificial intelligence is a set of systems and algorithms that enable a computer or machine to do tasks that were previously done by human intervention, such as learning, analysis, decision-making, and forecasting. It is considered one of the most prominent tools of the Fourth Industrial Revolution, and it has proven its effectiveness in various fields, including the financial, accounting and administrative sector (Tawfiq, 2019, p. 51).

Digital technologies in this realms include ICT-based tools and systems, including: databases, automation, cloud storage systems, pattern recognition, and electronic integration between organizations (Al-Saeed, 2022, p. 77). These technologies are used to manage tax processes from the registration of taxpayers to collection, review, and legal follow-up.

There is consensus by researchers that AI differs from standard computer systems in some key respects. One such a respect is that it can learn by itself and it can also predict how taxpayers might act. Not only this but tax authorities can spot fraud more easily in that they can find manipulation faster and can also make tax calculations better over time. The system keeps improving on its own (OECD, 2022, p. 47).

6.2.2 Artificial intelligence applications in tax collection

Tax administrations in many countries have begun to actively use AI tools in their dealings to improve collection efficiency. The most prominent of these tools are: electronic billing systems, big data analysis, machine learning, and institutional integration. These tools are used to detect cases of tax evasion, monitor unauthorized economic activities, and direct inspections towards sectors or individuals with atypical tax behaviour. For example, *Le Monde Économie* (2022, p. 45) mentions that in France, the tax authorities used artificial intelligence to analyse satellite imagery and detect unauthorized property, such as unlicensed pools. This procedure brought the added plus of introducing thousands of properties into the taxation system. In Egypt, the Ministry of Finance successfully activated the electronic billing system and electronic tax interconnection between companies, which contributed to reducing fabricated invoices and improving collection by a significant percentage in just two years. (Ministry of Finance, Egypt, 2023, p. 17).

India provides another example in its own right as it chose to examine data in advanced ways. Officials embarked on what businesses were doing. They also connected information from one department to another. That way, tax documents became more correct. Far more people started paying tax, as a result (World Bank, 2022, p. 22).

These cases sketched so far show AI works well for oversight. One of the features that testify to this workability is that it helps cut spending and heighten clarity. Another characteristic of AI is that it helps citizens to voluntarily comply with Iraq's tax authorities. On the minus side, it is imperative to note major issues that affect the country. One of such drawbacks is the fact that official bodies remain underdeveloped when it comes to money collection. Another issue of note here is the fact that the informal sector is keeping making strides in growth, which undermines the effective collection of tax revenues.

2. The current status of tax collection in Iraq and how to develop it using artificial intelligence

In our study, we shed light on the real challenges that we argue to affect taxation system in Iraq. We focus here on the institutional, technical, and legislative factors that hinder collection efficiency. It is worth noting that we also review how ready the legal environment and digital infrastructure are to welcome artificial intelligence systems. In addition, we then show how examples from around the world can set the scene for us to improve tax administration performance and thereby gaining an effective and sustainable digital transformation.

6.3 Tax collection efficiency in Iraq: an overview of challenges

As we iterated before, tax collection is supposed to be of a central and important role the Iraqi economy. However, as it turns out, this role is still lagging behind and restricted because of a range of structural and institutional challenges that hinder its effectiveness. With this in mind, it is our aim in this section to look at and analyse the most noticeable obstacles and difficulties that are facing the collection process right now. Our rationale here is the fact that these obstacles can be seen in different levels, whether we are talking about the institutional structure, the legal framework, or even the social environment around us in this country. Given these points, we aim here to diagnose and identify the gaps and weaknesses that prevent making sustainable and fair tax collection.

6.3.1 Institutional and technical infrastructure: an overview of weaknesses

Recall here the fact that it is no secret to note here that Iraq is languishing in structural drawbacks in its tax administration structure. This is visibly manifested in the procedures used in the country which still follow a traditional bureaucratic fashion whereby paper files and manual data are the main tools there. This pattern hinders the speed of completion, increases the chances of manipulation, and makes it difficult to apply subsequent or simultaneous control, according to Obaid (2021, p. 91).

The General Tax Authority suffers from the absence of unified digital databases that include all taxpayers, with weak coordination between relevant ministries and departments, such as the Ministry of Commerce, the Central Bank, the Companies

Registration Department, and customs authorities. This disconnection makes it difficult to accurately track economic activity, and creates a favourable environment for tax evasion (Ministry of Finance, Iraq, 2023, p. 11).

The country has no complete computer system manages revenue gathering as tax offices work separately. They have no access to customs records or bank details. Authorities lose their power to catch violations. Matching data instantly becomes impossible. Real-time oversight fails entirely (UN ESCWA, 2022) .

6.3.2 Legislative and social constraints

Many laws do not recognize digital documents as official proof, nor do they provide a legal framework for electronic billing or digital signature, making any digital transformation project subject to challenge or disruption (Rasheed, 2015, p. 135).

Iraq also lacks a unified law to protect personal data, which makes taxpayers reluctant to submit their data electronically for fear of leakage or misuse, which is both a psychological and legal barrier (Ministry of Planning, Iraq, 2022, p. 21).

On the social side, a large percentage of taxpayers do not have a sufficient digital culture to deal with electronic systems, in addition to the existence of societal resistance to any form of new tax control, especially in the absence of mutual trust between the citizen and the state (Abdullah, 2019, p. 94).

6.4 Opportunities to develop tax collection in Iraq using artificial intelligence

Despite the structural and administrative challenges facing the taxation system in Iraq, there are many promising opportunities that can be exploited to improve collection efficiency. One such a promising opportunity is to use AI tools and digital technologies since these have the potential to curb tax evasion, maximize the tax base, and have greater tax justice. In this paper, we examine the most prominent opportunities available, and their applicability within the Iraqi context (Iraqi Ministry of Finance, 2023, p. 22).

6.4.1 The possibility of integrating artificial intelligence into the Iraqi tax administration

Many official indicators indicate that Iraq has already begun its first steps towards digital transformation in the financial sector. The Ministry of Finance has launched plans to update the taxation system for the years 2023-2026 with an eye on developing the taxpayer database, enhancing electronic collection, and activating the electronic billing system in some pilot sectors.

These trends can be capitalized by gradually introducing AI tools at different stages of attainment. For example:

- Machine learning algorithms can be used to analyse historical tax data and predict taxpayers with erratic tax behaviour (IMF, 2021, p. 15).
- An “early warning system” could also be developed that warns against suspected cases of invoice manipulation or irrational filing, based on smart digital standards (Ministry of Finance, Egypt, 2023, p. 19).
- In addition, GTA databases can be linked with customs databases, the Real Estate Registration Department, and commercial banks, to form a unified digital file for each taxpayer, making it easy to evaluate accurately without the need for costly field visits.

These steps are not fictional, but have been implemented by Arab countries such as Egypt, which in less than two years has succeeded in digitizing thousands of tax operations, helping to control bills and reduce tax evasion (Iraqi Ministry of Finance, 2023, p. 22).

6.4.2 Strategic proposals for activating artificial intelligence in collection

In order to make the most of AI tools, Iraq should follow deliberate strategic steps that combine infrastructure, legislation, and capacity building.

1- Amending tax legislation to include provisions on electronic collection, digital documents, and digital signature, in order to protect the legality of digital procedures, and ensure their legal authority before the judiciary (Al-Qahwaji, 2016, p. 118).

2- Issuing a personal data protection law, which gives taxpayers the confidence to submit their data via digital platforms without fear of leakage or abuse, which is a necessary condition for achieving electronic compliance.

3. Training tax cadres on the use of artificial intelligence systems, through continuous training programs in cooperation with universities and research centres, and focusing on developing digital analysis skills, and managing smart systems.

4. Benefiting from the experiences of other countries, such as the UAE's experience in the "electronic tax linkage" system, and France's experience in using artificial intelligence to detect unauthorized property, and adapt these models to suit the Iraqi reality (World Bank, 2022, p. 27)

7 CONCLUDING REMARKS

To conclude, if we now look more closely at the situation, we can see that the problems of the Iraqi taxation system are not solely peculiar to a single area. We safely notice together that the issue is not only a matter of institutional structure or the legal framework used, although these are particularly very important parts. We can also safely say that difficulties come from fragile and old-fashioned tax collection *Modus operandis*. These latter methods are very slow and they simply do not match the very fast digital transformation that we see accelerating all over the world.

Because of this situation sketched above, and since Iraq often find itself under financial crises again and again, the problem even worsens. When the country cannot stand on a safe footing on oil revenues alone, the effect is very clear then. This shows us that the need for a taxation system that is smart, transparent, and highly efficient is not just a small need but a very urgent and pressing one. We can say with confidence here that such a system is necessary if Iraq wants to be in line with how this field is progressing around the globe.

The research showed that the use of AI and digital technologies is no longer an administrative luxury, but a necessity to reduce evasion, expand the tax base, and improve voluntary compliance. International experiences such as Egypt, France, India, and the UAE have also shown that investment in digital tax infrastructure leads to tangible results within a short period of time.

Accordingly, Iraq has a real opportunity to modernize its tax administration, provided that political will is available, the legislative environment is modified, human cadres are qualified, and databases are linked between state institutions.

7.1 Results

1. Tax collection is one of the essential tools for the implementation of fiscal policy, but Iraq suffers from institutional and legislative weakness that hinders the development of this tool.

2. International experience shows that the application of AI in taxation systems contributes to raising the efficiency of collection by more than 20% in short periods.

3. Lack of integration between financial institutions and weak tax database make it more difficult to track taxpayers and facilitate tax evasion.

4. No effective tax digital transformation can be achieved without the promulgation of modern laws that recognize electronic transactions and protect personal data.

5. Iraq has initial technical qualifications and existing government plans that can be built upon to gradually activate artificial intelligence systems in tax collection.

7.2 Recommendations

1. Updating the tax legal framework in line with the digital transformation, by including materials that recognize digital invoices, electronic signatures, and electronic collection as recognized legal means.

2. Building a unified national database for taxpayers, including financial, commercial, and real estate data, and linking them to centralized electronic platforms that use artificial intelligence techniques in evaluation and analysis.

3. Launching continuous training programs for GTA employees in the field of digital analysis, smart software management, and interpretation of the results of machine learning systems.

4. Activating cooperation between the Ministry of Finance, universities and research centres to develop local artificial intelligence applications that are in line with the Iraqi reality, instead of relying entirely on imported software.

5. Benefiting from successful Arab and international experiences, such as the UAE system in electronic integration, the Egyptian system in smart invoicing, and the French system in digital tracking of property, and trying to adapt these experiences within the Iraqi environment.

6- Issuing a law to protect personal data as a prerequisite for the success of any digital tax platform, and providing the required confidence for citizens to submit their data online.

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Authors' Contribution

All authors contributed equally to the development of this article.

Data availability

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