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REQUIREMENTS AND PROSPECTS FOR ADOPTING ARTIFICIAL INTELLIGENCE IN THE IRAQI TAX ADMINISTRATION

Assistant Lecture Azhar Hassan Hussein
Financial Control Department of Accounting and,
College of Business Economics Al-Nahrain University, Baghdad, Iraq,
Email: azharalabbadi25@nahrainuniv.edu.iq

Abstract
This research aims to assess the technical readiness of tax authorities and stakeholders to adopt artificial intelligence. It examines the role of artificial intelligence in tax collection, focusing on its benefits and potential challenges in the Iraqi environment. It discusses the current situation of Iraqi tax work, which is often manual, time-consuming, error-prone, and assumes that artificial intelligence can help improve the efficiency and accuracy of this process. This study addresses the various factors through which artificial intelligence can be applied in tax collection, with anticipated benefits such as fraud and tax evasion detection. The research followed a descriptive-analytical methodology, collecting data from a sample of tax professionals. The main finding of the research is that there are currently many challenges facing the adoption of this technology, as the necessary conditions are only available to a moderate extent. There is a strong impact of the availability of requirements for adopting artificial intelligence in the tax field in terms of (infrastructure, enabling environment, human resources, expected benefits) on the intention to use artificial intelligence in the tax field. The study recommended the need to emphasize raising the available requirements for adopting this technology, strengthening them, especially in terms of providing expert and trained human resources, and updating laws and regulations to suit the use of modern technologies.

Keywords: Tax collection - Tax audit - Artificial intelligence - Tax system.

Introduction

The latest Artificial Intelligence (AI) revolution in many fields in all aspects of life , and its potential applications in the field of taxes are wide and varied. In Iraq, the use of artificial intelligence in taxes is still in its early stages, but it holds great promise for improving tax compliance, enhancing efficiency, and reducing costs. Taxes are a vital element in public finance in any country, and their efficient management is an essential requirement for achieving economic growth and stability. However, traditional methods of tax collection and compliance often face challenges, such as high rates of tax evasion, cumbersome procedures, and limited resources. The emergence of artificial intelligence technology offers a solution to these problems by providing advanced tools for data analysis, pattern recognition, and automated decision-making.

Secondly- The Problem of Taxation Study

The current tax administration in Iraq faces difficulties that hinder the effectiveness of tax organization, its quality, fairness, and efficiency of tax assessment, leading to increased tax avoidance, evasion, and fraud. What are the appropriate alternatives to enhance this system, and can artificial intelligence techniques be adopted to solve the problems it faces, and what are the challenges facing this application.

Thirdly- The Importance of the Study

The importance comes from discussing a modern and necessary topic that addresses artificial intelligence and tax collection. It is expected that the results of this research will contribute to activating the role of artificial intelligence in tax imposition in Iraq, reducing the problems and challenges it faces, and thus increasing the state's tax resources.

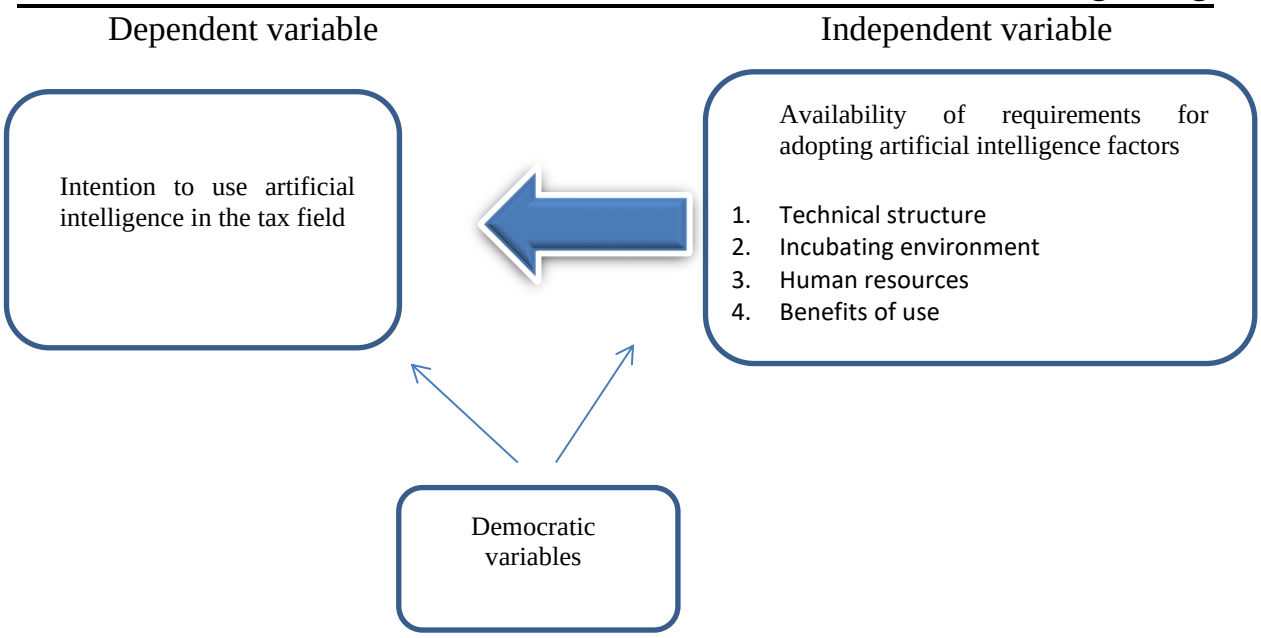
Fourthly - Study Objectives

This research aims to explore the possibilities, challenges, and benefits of applying artificial intelligence in the tax sector in Iraq, with a study of the technical, environmental, human resources aspects, and expected benefits. The focus will be on achieving the following objectives:

• Evaluate the current situation of the tax system in Iraq and identify the key areas where artificial intelligence can be utilized.
• Explore the technical and infrastructural requirements necessary for the application of artificial intelligence.
• Identify the administrative, organizational, and legal support governing the use of artificial intelligence in taxes in general.
• Analyze the benefits and challenges of adopting artificial intelligence in taxes.
• Evaluate the technical readiness of tax authorities and stakeholders to adopt artificial intelligence.
• Provide recommendations to policymakers, tax administrators, and stakeholders on the effective implementation of artificial intelligence in the tax sector.

Fifth- study Variables and Model

Independent: Availability of requirements (factors) for adopting artificial intelligence: (structural infrastructure, nurturing environment, human resources, benefits of usage). Dependent: Intention to use artificial intelligence in the tax field.



Sixth- Study Hypotheses

The following will be studied:

Main Hypothesis One: H01

There is no statistically significant relationship between the availability of requirements for artificial intelligence (structural infrastructure, nurturing environment, human resources, benefits of usage) and the intention to adopt artificial intelligence in the tax framework.

Main Hypothesis Two: H02

There is no statistically significant impact of the availability of requirements for adopting artificial intelligence in the tax framework and the desire to use it.

Main Hypothesis Three: H03

There are no statistically significant differences in the responses (opinions) of sample individuals attributed to personal variables (gender, age group, educational level, number of years of experience in the tax field, degree of experience with modern technologies).

Seventh- Study Methodology

An analytical descriptive methodology was followed. An applied study was conducted using a prepared questionnaire to study the reality, benefits, and requirements for applying artificial intelligence in the tax field, and it was analyzed using the statistical program SPSS.

Eighth- Study Population and Sample

The study population consisted of workers in the tax field in Iraq, and the questionnaire for the study was distributed to a convenient sample from this population, with a sample size of (68 respondents).

Ninth- Data Collection Tools:

A questionnaire to assess the availability of requirements for using artificial intelligence in the Iraqi tax field and measure the willingness to adopt it by the Iraqi tax administration.

Tenth - Previous Studies

I. Arabic Studies

- A study (Fahl, 2022) titled: The Role of Artificial Intelligence in Tax Transactions

The study aimed to explore the potential of deploying advanced data analytics and artificial intelligence in taxation to facilitate compliance and assist professionals and their clients in addressing common questions. While data analysis has received significant attention, the use of artificial intelligence in taxation is a relatively new phenomenon.

The study revealed that legislative authorities have the task of introducing a specific approach to tax management and collection processes, and adopting successful artificial intelligence initiatives as small incremental steps rather than pursuing a large project. It emphasizes the importance of considering justice aspects in legislation.

The study addressed several aspects, including the concept of artificial intelligence in contemporary tax transactions and contemporary challenges, as well as the use of artificial intelligence in overcoming tax challenges.

Study (Mubarki, 2021) entitled: Tax Collection: Reality and Prospects

The aim of the research is to study the nature of tax collection in Algeria and its development prospects, which occupies an important place in the tax establishment processes. Through it, tax situations shift from digital to cash status, considering it the most important means to finance the state budget and local needs. The research includes in the first section the nature of tax collection, its procedures, forms, and rules, and in a second section it reviews the state of tax collection in Algeria, highlighting its weak performance. The research shows that the Algerian tax system is declarative, as it gives the taxpayer the freedom to determine the tax base according to the declarations submitted to the tax administration. Some weaknesses in the existing tax collection were identified, and a plan for improvement was developed along with recommendations to achieve greater efficiency in tax collection.

- A study by (Ahmed and Saleh, 2018) titled: The Use of Expert Systems in Tax Environment Development

The research aimed to study the use of expert systems in improving the tax environment and their role in enhancing the quality of work in tax administration. It also aimed to streamline the decisions of tax examiners and develop their performance due to the shortcomings of traditional operational systems in meeting the requirements of tax administration. This necessitates the use of automated technologies such as expert systems in the tax environment to keep up with modern technological changes, develop tax administration work, and thus achieve the targeted tax revenue.

The study concluded that the use of expert systems will lead to achieving many advantages in enhancing tax work and improving its quality. They also play a crucial role in streamlining

decision-making by tax examiners and developing their performance through benefiting from the advantages provided by expert systems in the tax framework.

Study (Raouf and Al-Shafie, 2021) entitled: The Reality of the Tax System in Iraq and the Possibility of Development 2021

Aimed to investigate the reality of the tax system in Iraq and analyze it to diagnose its strengths and weaknesses. It proposed future suggestions to make it suitable and motivating for development, modernization, growth, and reform processes. The first axis addressed the concept of the tax system and types of taxes in Iraq, while the second addressed the obstacles and challenges of the tax system and the contribution of tax revenues to the general budget. The third axis addressed suggestions that lead to the development of the tax system in Iraq, and the research was based on a main hypothesis that identifying the problems facing the tax system in Iraq and proposing logical solutions will achieve the financial goal of taxation. The research resulted in several conclusions, the most prominent of which is that the tax system does not contribute sufficiently to public spending. One of the key recommendations of the research was the necessity to establish a new tax management system that applies to all tax laws, taking into account the specificity of each tax, and recommended the need to revitalize industrial sectors and raise tax awareness among taxpayers.

II. Foreign Studies

- A study by Faúndez-Ugalde, 2020, titled: "The Use of Artificial Intelligence by Tax Administrations: An Analysis Related to Taxpayers' Rights in Latin American Countries"

The aim of this paper was to analyze taxpayers' rights in accessing artificial intelligence algorithms and formulas used by tax administrations in Latin America. It studied two applications of artificial intelligence: in describing tax payers' risks and automating tax audit procedures. There is very little description in the literature on how these technologies coexist with taxpayers' rights, especially in exercising their right to defense in administrative procedures and disputes. The evidence reflects that despite the lack of clear regulation on access to these technologies in the countries under study, the general principles derived from fundamental rights declared by each state make it possible to protect taxpayers' rights in accessing this information.

Study (Saragih, 2022) entitled: Potential Application of Artificial Intelligence (AI) to Update Tax Management System: The Case of Indonesia

The tax-to-GDP ratio in Indonesia decreased from 2010 to 2020, as the tax authority lacks the ability to collect taxes. Therefore, updating the tax administration system using information technology is considered necessary. Artificial Intelligence (AI) technology may be a solution to this problem. Using theoretical frameworks on tax compliance innovations, tax costs, success factors for Information Technology Governance (SFITG), and AI readiness, this study aims to analyze costs and benefits, enabling factors and inhibitors, and government readiness. And relevant stakeholders for applying AI to update the tax management system in Indonesia. This study uses qualitative methods for data collection and

analysis. Data was obtained through in-depth interviews. The results show that the application of AI in taxation can help tax authorities enforce the law, provide taxpayers with ease in fulfilling their tax obligations, improve fairness for all taxpayers, and reduce tax compliance costs.

The openness of Indonesia to technological developments, as evident from the National Artificial Intelligence Strategy, is a supportive factor for the application of artificial intelligence in Indonesia, especially for updating the tax administration system. The lack of specific regulations governing the adoption of artificial intelligence, along with the shortage of personnel working in tax administration, data, and the existing supporting infrastructure, are obstacles that hinder the implementation of artificial intelligence to update the tax administration system in Indonesia.

Comment on Previous Studies:

Each of the presented studies addressed the topic in different ways, and we noticed that Arab studies, despite their recentness, lack many modern aspects in the use of artificial intelligence in the tax framework. Each study focused on specific aspects of artificial intelligence in different environments. The current study primarily focuses on evaluating the current situation and prospects of artificial intelligence and its potential application in Iraqi tax collection, as well as the degree of willingness to implement it by Iraqi authorities in tax entities.

Theoretical Framework

Tax System

The tax system constitutes a backbone of government finance, as it is considered a primary means to generate the necessary revenues to finance public programs and services. The tax system consists of a set of laws and regulations that determine how taxes are imposed on individuals and companies. The aim of this system is to guide financial flows in the economy and ensure a fair balance in bearing tax burdens.

Tax Administration

Tax administration is a vital part of the tax system, playing a crucial role in implementing tax policies and ensuring compliance with laws and regulations. Tax administration is responsible for collecting taxes, monitoring tax assessments, providing advice to taxpayers, and implementing accounting records to ensure effective financing of government projects (Jasim, 2010).

The tasks of the tax administration

The tasks of the tax administration include managing tax collection and monitoring, and ensuring the precise and fair implementation of tax policies. Tax administration enhances transparency and effective communication with taxpayers to ensure positive interaction and voluntary compliance (Aarimi, 2023).

Tax evasion

Tax evasion poses a significant challenge to the tax system, causing revenue loss and disrupting collection operations. Tax evasion involves taxpayers avoiding paying taxes legally, requiring the development of strategies and tools to combat this phenomenon and ensure tax integrity (Khedr, 2021).

Tax reform

Tax reform is an important part of developing the tax system to improve its efficiency and effectiveness. Tax reform includes amendments to tax laws and regulations aimed at simplifying procedures, improving policy guidance to enhance economic growth, and achieve balance.

Tax reform and the role of modern technologies

Modern technology, especially artificial intelligence (AI), plays a crucial role in tax reform processes to achieve a significant transformation in how tax policies are organized and implemented. AI plays a vital role in improving the efficiency of the tax system and enhancing transparency and fairness, through the application of advanced techniques such as big data analysis and machine learning. Tax authorities can enhance monitoring and analysis processes to identify tax evasion cases faster and more accurately. AI also contributes to simplifying tax procedures for taxpayers by providing an automatic and seamless compliance system, reducing errors and promoting voluntary compliance.

Thanks to AI, tax policy guidance and formulation can be improved based on precise analysis of economic and social needs. This allows the government to improve spending guidance and achieve a balance between revenue generation and economic growth (JingYi, 2019).

Furthermore, AI contributes to enhancing communication between tax authorities and taxpayers, providing smart services to simplify procedures and better guide taxpayers, enhancing positive interaction and trust in the tax system.

Field Study

I. Introduction

A data collection form was designed to suit the research topic and its variables, and underwent arbitration and testing.

Appropriate statistical methods were followed to evaluate the reality of tax work towards the use of artificial intelligence technology.

II. Questionnaire Components and Testing

The questionnaire consists of three main sections:

The first section is about general personal data.

The second section measures the influencing variable and includes 21 questions to assess the availability of the following requirements for adopting artificial intelligence in tax system management (infrastructure - nurturing environment - human resources - expected benefits).

The third section measures the influencing variable and includes 6 questions to assess the intention to adopt artificial intelligence in the tax field.

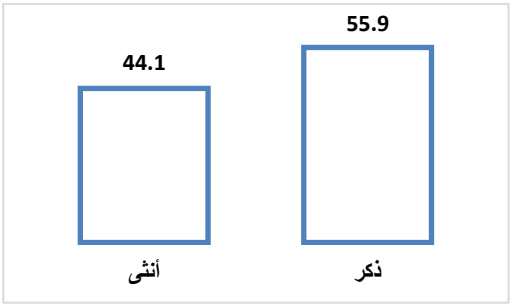
The questionnaire was tested on a random sample of 30 respondents, and the internal consistency reliability of all studied statements with their dimensions was verified. It was found that all Pearson correlation coefficients between paragraphs of each dimension and its total score were statistically significant at a significance level of (0.01). The correlation coefficients values ranged between [0.667-0.878] for the statements in the first dimension with their dimension. Between [0.751 -0.856] for the phrases on the second axis with its axis, and between [0.789 - 0.865] for the phrases on the third axis with its axis, and between [0.830 -0.894] for the phrases on the fourth axis with its axis, and between [0.792-0.943] for the phrases on the fifth axis (the affected variable) with its axis. Also, it assured us of the high stability of the study tool (questionnaire) and the validity of its internal consistency, which allows us to use it with confidence.

The overall reliability coefficient for the study axes (Cronbach's alpha coefficient) was high, reaching (0.920) for all the questionnaire items totaling 27. The reliability of the axes ranged from (0.851) as a minimum for the third axis - human resources, to (0.935) as a maximum for the fourth axis - expected benefits. In general, we find that the entire questionnaire exhibits a very high degree of reliability (much higher than the minimum reliability threshold of 0.7). The internal structure validity was verified as the correlation coefficients were high between [.840-.920]. The questionnaire items can be relied upon in the field application of the study.

Analysis of the characteristics of the studied group

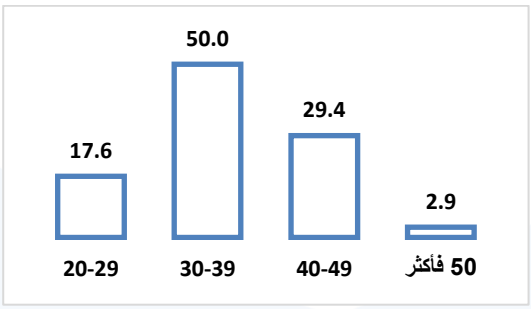
Sample characteristics by gender

The study sample consisted of (68) workers in the Iraqi tax field, with females accounting for 44.1% of the sample, while males accounted for 55.9%.



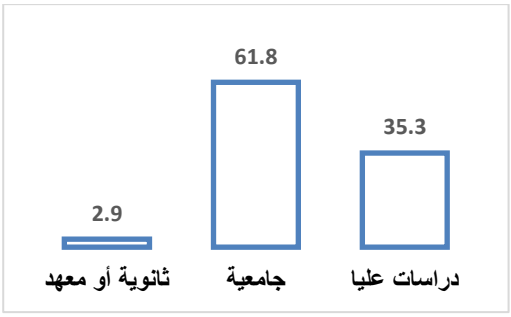
Age groups of the sample individuals

The age groups in the sample varied, with half of the sample individuals falling between the ages of 30-39, one-third between 40-49, 17.6% between 20-29, and 3% over the age of 50.



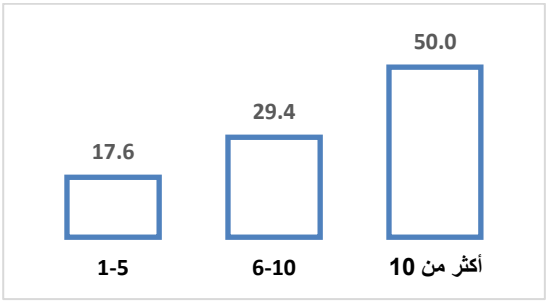
Educational level of the sample individuals

Educational levels in the sample varied, with the majority holding university and postgraduate degrees, indicating an academically educated group whose opinions enrich the research, suggesting that the responses will carry a good scientific strength and background.



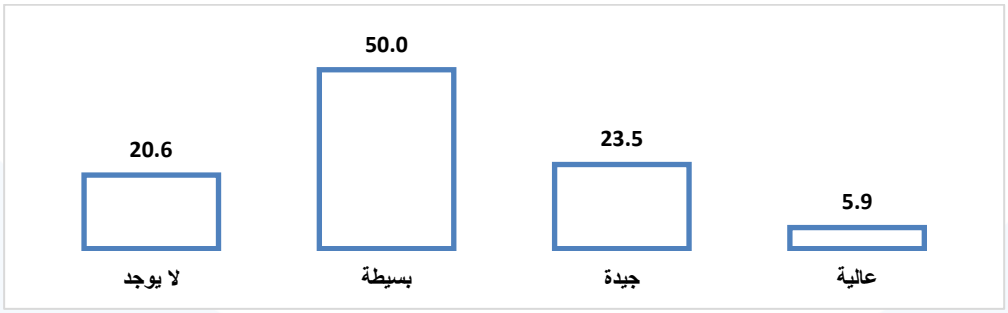
Years of experience in the tax field for the sample individuals

Half of the sample individuals have more than 10 years of experience, approximately one-third of them have 6-10 years of experience, and 17.6% of them have less than 5 years of experience. This means that the majority of the sample individuals have good experience in the tax field, which is very useful in understanding their opinions.\



Level of experience in modern technologies among the sample individuals

Half of the sample individuals have basic experience in modern technologies, almost a quarter of them have good experience, 6% have high experience, while 20.6% have no experience at all. These characteristics indicate an acceptable level of expertise in this advanced field, and it is possible to enhance their skills through training.



Study of Arithmetic Means

Study of general arithmetic means for axes

Table 1: General arithmetic means for axes

	Independent variable axes	Weighted average	Standard deviation	Weighted relative average	Grade
1	Structural framework	**2.81**	**0.67**	**56%**	**Medium**
2	Incubating environment	**2.99**	**0.65**	**60%**	**Medium**
3	Human resources	**2.74**	**0.76**	**55%**	**Medium**
4	Expected benefit	**3.68**	**0.75**	**74%**	**High**
	Total score for the independent axis	**3.06**	**0.71**	**61%**	**Medium**
5	Total score for the dependent axis: Desire to use artificial intelligence	**2.92**	**0.82**	**58%**	**Medium**

Weighted means for the total score of the requirements for adopting artificial intelligence technology (independent variable) showed a moderate increase, with the weighted arithmetic mean reaching 3.06. It is noted that the expected benefit axis achieved the highest relative mean compared to the other axes, with a value of 3.68, representing (74%) and a high degree, indicating a high expected benefit from using artificial intelligence in the tax field. This is followed by the incubation environment axis (60%), then the technological environment (56%), and then the human resources (55%). As for the dependent variable (usage desire axis), it achieved a moderate approval rate of (58%).

The detailed presentation of the study axes in terms of their means is as follows.

Study of detailed arithmetic means for axes

Means of the first axis: Technological structure

Table 2: Means of the first axis: Technological structure

	Paragraphs	Weighted mean	Standard deviation	Weighted relative mean	Rank	Descent average ranking
1	Available computer devices provide fast and accurate data processing	3.35	0.73	67%	**Medium**	2
2	Analyzable electronic data is available in tax administration	3.41	0.65	68%	High	1
3	Appropriate software for modern technologies such as artificial intelligence is available	2.76	0.95	55%	**Medium**	3
4	Modern technologies have been implemented in some tasks or departments in tax administration	2.56	1.07	51%	LOW	5
5	Artificial intelligence has been used to analyze taxpayers' behavior and financial situations	2.15	1.07	43%	LOW	6
6	The infrastructure is capable of developing diverse services that match those offered in global tax systems	2.65	0.69	53%	**Medium**	4

We notice through the study of the availability of infrastructure components in the tax administration that the most available is analyzable electronic data, with a high weighted

average (68%). Indeed, electronic data is considered one of the most important components of artificial intelligence, as it will be relied upon in building models, identifying all previous events, and then applying artificial intelligence to them. Following that is the availability of fast computer devices capable of processing data, achieving a relative weighted average of (67%). From a research perspective, the availability of suitable computer devices for applying artificial intelligence is considered average and needs improvement. It was found that the lowest relative weighted average (43%) showed a lack of previous experience in the tax administration using artificial intelligence to analyze taxpayers' behavior and financial situations. Similarly, we find a lack of application of modern technologies in some tasks or departments in the tax administration.

Second axis averages: Incubator environment

Table 3: Second axis averages: Incubator environment

	Paragraphs	Weighted mean	Standard deviation	Weighted relative mean	Rank	Descent average ranking
7	The tax administration supports the development of work mechanisms towards the use of artificial intelligence.	3.06	0.84	61%	Medium	1
8	Financial resources are available to support the development of work mechanisms.	3	0.85	60%	Medium	2
9	The tax administration is interested in training human resources on modern technologies.	2.97	0.86	59%	Medium	3
10	The tax administration is interested in keeping up with the latest technologies.	2.97	0.83	59%	Medium	3
11	There is a suitable legislative and regulatory framework for using modern technologies in analyzing taxpayers' data and using them by artificial intelligence software.	2.97	0.62	59%	Medium	3

We conclude from the previous table that the nurturing environment for artificial intelligence in tax administration is of moderate presence. Primarily, management support and interest in developing work mechanisms in tax administration with a relative weighted average value of (61%) comes first, followed by the availability of financial resources to support the development of tax administration work mechanisms (60%). In third and last place are three components with a relative weighted average of (59%), which are the care for enhancing the skills of the workforce, management's interest in keeping up with the latest technologies, and the availability of appropriate legislative and regulatory frameworks in using modern technologies to analyze client data. These three components require more attention if tax administration truly wants to use artificial intelligence in the tax field.

Axis Three Averages: Human Resources

Table 4: Axis Three Averages: Human Resources

	Paragraphs	Weighted mean	Standard deviation	Weighted relative mean	Rank	Descent average ranking
12	The Iraqi Tax Administration has human resources specialized in information technology.	3.21	0.84	64%	Medium	1
13	Human resources specialized in data science and data analysis are available.	2.76	0.95	55%	Medium	3
14	There are experts in artificial intelligence.	2.18	0.96	44%	low	4
15	The Tax Administration has human resources capable of learning artificial intelligence.	2.79	0.91	56%	Medium	2

Through the study of the human resources axis, it is evident that the tax administration has personnel with intermediate expertise in informatics, with a weighted average availability of (64%). This is followed by the availability of human resources capable of learning artificial intelligence with a relative average of (56%), then the availability of data analysis specialists with a relative average of (55%), and lastly the presence of experts in artificial intelligence in the tax administration with a relative average of (4%).

Fourth axis averages: Expected benefits of using artificial intelligence in the tax field

Table 5: Fourth axis averages: Expected benefits of using artificial intelligence in the tax field

	Paragraphs	Weighted mean	Standard deviation	Weighted relative mean	Rank	Descent average ranking
16	Increasing accuracy in tax collection and reducing errors	3.71	0.87	74%	high	2
17	Helps in reducing tax evasion by monitoring taxpayers' behavior and analyzing it in real time	3.76	0.88	75%	high	1
18	Helps in detecting tax fraud	3.59	0.92	72%	high	3
19	Optimal segmentation of taxpayers based on their behavior, individual circumstances, population composition, and other characteristics.	3.74	0.79	75%	high	1
20	Increasing trust in tax administration and increasing tax revenues	3.68	0.91	74%	high	2
21	Improving work efficiency, speed, and simplifying procedures	3.62	0.85	72%	high	3

Through the study of the expected benefits of using artificial intelligence in the tax field, it is evident that there are high benefits to this technology. The two most beneficial aspects, according to the researchers, are firstly in reducing tax evasion by monitoring and analyzing taxpayers' behavior in real time, and secondly in optimizing tax payers based on their behavior, individual circumstances, demographic composition, and other characteristics. The weighted average relative percentage for both benefits was (75%), followed by the benefit of increasing tax collection accuracy and reducing errors, and the benefit of increasing confidence in the tax administration and increasing tax revenues with a relative average percentage of (74%). With a high degree not far from the previous percentages, individuals in the sample see that one of the benefits of artificial intelligence is in detecting tax fraud, as well as enhancing the tax administration's ability to improve work efficiency, speed, and streamline procedures.

Fifth Axis Means: Intention to Adopt Artificial Intelligence

Table 6: Fourth Axis Means: Expected Benefits of Using Artificial Intelligence in the Tax Field

	Paragraphs	Weighted mean	Standard deviation	Relative weighted mean	Grade	Descending order of means
22	The tax administration aims to increase performance strength in tax work	3.09	0.96	62%	Medium	1
23	The tax administration aims to develop work technologies and support decision-making	3.12	0.97	62%	Medium	1
24	The tax administration realizes the importance of relying on artificial intelligence in tax collection efficiency	2.91	0.99	58%	Medium	2
25	The tax administration aims to adopt artificial intelligence technologies in the tax field	2.79	1.00	56%	Medium	3
26	The tax administration intends to train current employees on artificial intelligence	2.71	0.93	54%	Medium	3
27	The tax administration realizes the importance of relying on artificial intelligence in increasing tax revenue and raising tax contribution to the national income	2.88	0.91	58%	Medium	2

The dependent variable in this study measures the tax administration's desire to develop work and use or adopt artificial intelligence in the tax field. It was revealed through the respondents' answers that this axis achieves a moderate level of evaluation, meaning there is a moderate desire within the tax administration to adopt this technology. It was shown in the previous table that the highest relative average percentage of answers (62%) was for the first two statements related to the tax administration's desire to develop work technologies and decision support, and the second related to the tax administration's focus on increasing performance in tax work, followed by a relative average percentage of answers (58%) for the first two statements related to the tax administration's perception of the importance of relying on artificial intelligence in tax collection efficiency, and the second in increasing tax revenue and raising tax contribution to the national income. It appears that the respondents believe that the tax administration desires, with an average value of (56%), to adopt artificial intelligence technology in tax administration, and intends with a moderate degree estimated at (54%) to train current workers on artificial intelligence.

T-Test

We conducted a t-student test to study the differences between the assumed average of the statistical community, estimated at 3 because we used a Likert pentagon scale, and between the averages of the axes. It is worth noting that the values of the studied axes' averages are normally distributed according to the tests conducted on them in this research.

Table 7: T-Test

Study axes	Mean	Standard deviation	Degrees of freedom	T value	Level of significance
Infrastructure	2.81	0.67	67	-2.28	0.025
Incubating environment	2.99	0.65	67	-0.075	0.941
Human resources	2.74	0.76	67	-2.87	0.005
Expected benefits	3.68	0.75	67	7.44	0.000
Degree of willingness to use artificial intelligence	2.92	0.82	67	-0.83	0.408

The average of the structural axis is estimated at 2.81, and the average of the human resources axis is estimated at 2.74, both of which are less than the assumed average of 3. This test showed a significant difference between them and the assumed average because the significance level of 0.00 is smaller than the significance level of 0.05.

We observe that the average of the nurturing environment axis is estimated at 2.99, and it was found that there is no statistically significant difference between it and the assumed average because the significance level of 0.941 is greater than the significance level of 0.05.

We observe that the average of the degree of willingness to adopt artificial intelligence is estimated at 2.92, and there is no statistically significant difference between it and the assumed average because the significance level of 0.408 is greater than the significance level of 0.05.

In conclusion, the estimates were at a moderate level in all the studied axes.

Studying the relationship between the influencing variable and the influenced variable.

Studying the main hypothesis and its derivative hypotheses.

H01: There is no statistically significant relationship between the availability of artificial intelligence requirements in the tax field and the tax administration's willingness to use it. This leads to the study of correlations between each axis of the influencing variable with the affected variable.

Table 8: Pearson correlation coefficients between the independent variable (with its axes) and the dependent variable

Availability of requirements for adopting artificial intelligence in the tax field

	The independent variable Adoption technology requirements	The components of the independent variable			
		Infrastructure	Incubating environment	Human resources	Expected benefits
Dependent variable Intention to use artificial intelligence	**0.779**	**0.603**	**0.648**	**0.740**	**0.266**
Level of significance	0.00	0.00	0.00	0.00	0.014

It is evident from the above that there are statistically significant positive correlations between the affected variable and the influencing variables, with the strongest of these relationships being with the entire influencing variable where the correlation coefficient value was (0.779), indicating a strong relationship. The strength of the relationship for the affected variable with each axis of the independent variable was as follows in descending order: strongest with the human resources axis (0.74), then with the nurturing environment axis (0.648), then with the technological environment axis (0.603), and finally with the expected benefits axis (0.266). We interpret the above results as indicating that the willingness to use artificial intelligence is strongly associated with the combination of all axes of the independent variable representing the degree of availability of requirements for adopting this technology. The more these requirements are available, the greater the willingness of the tax administration to adopt the use of artificial intelligence. The most important requirement for adopting artificial intelligence technology is the availability of human resources capable of implementing this technology, followed by the availability of a supportive environment represented by management support and its interest in securing financial resources, human capabilities, and appropriate laws. Then comes the role of the technological infrastructure in influencing the desire to adopt. It is noteworthy that despite the sample's endorsement of the significant benefits that could be achieved from adopting

artificial intelligence technology in the tax field, the correlational relationship between the expected benefits axis and the dependent variable was weak. From a research perspective, this result is logical, especially since the average desire to adopt this technology received a moderate rating of (58%), while the expected benefit axis received a high rating of (74%) (refer to Table 1).

Generally, since the strength of all variable axes was higher than partial strength, we will take this into consideration in studying the full impact of the independent variable on the dependent variable.

Testing the second main hypothesis

H02: There is no statistically significant impact of the availability of requirements for adopting artificial intelligence in the tax field on the desire to use it in the tax field.

For the purpose of testing the hypothesis, a simple linear regression test was conducted to test the relationship between the independent variable (availability of artificial intelligence adoption requirements in the tax field) and the dependent variable (intention to use artificial intelligence).

Table 9: Statistical significance of testing the relationship between the availability of artificial intelligence adoption requirements in the tax field and the intention to use artificial intelligence

Std. Error	**Adjusted R^2**	**R^2**	**R**
0.52062	0.602	0.608	0.779

It is evident from the above table that the correlation coefficient R value is (0.779), confirming the strong correlation between the availability of artificial intelligence adoption requirements in the tax field and the intention to use artificial intelligence, as hypothesized. The coefficient of determination is (0.608), meaning that the availability of artificial intelligence adoption requirements in the tax field explains (60.8%) of the variations in tax administration's willingness to use it. The remaining percentage (39.2%) is attributed to other variables not included in the study.

Table 10: Statistical significance of testing the explanatory power of the study model variance

Test ANOVA						
Sig.	F	Mean Square	Df	Sum of Squares	Model	
0.000[b]	102.177	27.694	1	27.694	Regression	
		0.271	66	17.889	Residual	
			67	45.583	Total	

The above table shows the analysis of variance, through which the statistical significance of the explanatory power of the model can be determined using the F-statistic, which is (102.177), with a calculated significance level (sig=0.000), confirming the statistical

significance of the linear regression model statistically, meaning the model is overall significant.

Table 11: Statistical significance of the study model for the impact of availability of artificial intelligence adoption requirements in the tax field on the intention to use artificial intelligence.

Sig.	T	Standardized Coefficients	Unstandardized Coefficients		Model	
		Beta	Std. Error	B		
0.018	-2.424		0.386	-0.937	(Constant)	
0.000	10.108	0.779	0.125	1.261	Availability of requirements for adopting artificial intelligence in the tax field	

That is, the relationship between the availability of artificial intelligence adoption requirements in the tax field is statistically significant based on the calculated t-values and statistical significance that was less than (5%), confirming the validity of the hypothesis, and thus there is a significant meaningful impact of the availability of artificial intelligence adoption requirements in the tax field on the intention to use it in the tax field.

From the above, we conclude that the general regression equation between the independent variable, which is technology adoption requirements (x), and the dependent variable, which is the intention to use (y), takes the following form:

$$\mathbf{y = -0.937 + 1.261\,x}$$

That is, as the availability of artificial intelligence adoption requirements increases by one unit, this leads to an increase in the tax administration's desire to use artificial intelligence technology by (1.261).

Therefore, we conclude that there is a significant meaningful impact of the availability of artificial intelligence adoption requirements in the tax field on the tax administration's desire to use, and the relationship between them is strong and reaches (0.779). The availability of artificial intelligence adoption requirements in the tax field explains (60.8%) of the variations in the tax administration's desire to use.

Test of the Third Main Hypothesis

H03: There are no statistically significant differences in the responses (opinions) of the sample individuals attributed to personal variables (gender, age group, educational level, years of experience in the tax field, level of expertise in modern technologies). This hypothesis was tested after dividing it into tests for hypotheses with the number of studied personal variables, and the following table summarizes the most important results obtained by applying ANOVA test on the studied axes, where only the fields of interest in interpreting the results were selected.

Table 12: ANOVA analysis to test whether differences in variables are attributed to any of the personal variables

Test **ANOVA**										
Variables Personality / Study axes	Gender		Age group		Educational level		Experience in the tax field		Experience in modern technologies	
	F	**Sig.**	F	**Sig.**	F	**Sig.**	F	**Sig.**	F	**Sig.**
Structural organization	.022	.882	3.126	.062	.157	.855	1.791	.175	7.775	.000
Incubating environment	.933	.338	4.399	.097	.861	.428	.323	.725	2.370	.079
Human resources	1.313	.256	7.081	.100	2.481	.092	3.450	.078	10.072	.000
Expected benefits	.020	.888	3.692	.116	1.854	.165	.315	.731	1.970	.127
Intention to use artificial intelligence	1.534	.220	4.025	.111	1.991	.145	2.853	.065	11.334	.000

The result of the ANOVA test shows that the level of significance is greater than the assumed significance level (0.05) in cases of the following personal variables (gender, age, education level, experience in the tax field), indicating that there are no significant differences in the responses of the sample individuals attributed to their personal variables. However, it was found that the level of significance is greater than the assumed significance level (0.05) in the case of the variable of expertise in modern technologies in some axes, indicating significant differences in the responses of the sample individuals in the axes (technological environment, human resources, bank's intention to use) attributed to their expertise in modern technologies. Upon closer examination of the means table (Table 13), it is observed that individuals with good and high expertise had higher estimates than (3) and higher than the rest in these axes. It was noted that individuals with high expertise estimated a weak desire (with an average of 1.5) for the Iraqi tax administration to use artificial intelligence.

Table 13: Means of responses according to the variable of expertise in modern technologies

Averages of responses	Repetition	Experience Level	
2.33	14	None	The infrastructure
2.97	34	Basic	
3.10	16	Good	
2.00	4	High	
2.81	68	Total	
2.69	14	None	The incubating environment
2.98	34	Basic	
3.30	16	Good	
3.00	4	High	
2.99	68	Total	
2.50	14	None	Human resources
2.75	34	Basic	
3.25	16	Good	
3.38	4	High	
2.74	68	Total	
3.62	14	None	Expected benefits
3.85	34	Basic	
3.54	16	Good	
3.00	4	High	
3.68	68	Total	
2.55	14	None	The intention of the bank in usage
2.95	34	Basic	
3.52	16	Good	
1.50	4	High	
2.92	68	Total	

Results

This study was able to evaluate the availability of requirements for adopting the use of artificial intelligence technology in the Iraqi tax field, and to assess the willingness of the tax administration to adopt this technology from the perspective of the sample individuals representing those working in the Iraqi tax field. The following are the main results that have been reached:

1- Through the study of the availability of requirements for adopting artificial intelligence technology (the independent variable), it was shown that there is a moderate possibility of adopting it in the current Iraqi tax field, as the technological infrastructure, incubating environment, and human resources are present to a moderate degree. Also, through the study of the dependent variable, it was shown that the Iraqi tax administration has a moderate willingness to adopt artificial intelligence technology in the Iraqi tax field, indicating that there are currently many challenges facing the adoption of this technology.

2- There is a strong impact of the availability of requirements for adopting artificial intelligence in the tax field in terms of (technological infrastructure, incubating environment, human resources, expected benefits) on the intention to use artificial intelligence in the tax field. The human resources axis is the most influential on the willingness to use because the presence of expert staff increases the willingness to use, while the expected benefits axis is the least influential on the willingness to use, as despite the expected benefits being significant, the willingness to adopt this technology is still limited in the Iraqi tax field.

The general regression equation between the independent variable, which is the requirements for adopting technology (x), and the dependent variable, which is the intention to use (y), is as follows:

$y = -0.937 + 1.261x$

This means that an increase in the availability of artificial intelligence adoption requirements by one unit leads to an increase in tax authority's desire to use the technology by 1.261. The determination coefficient shows that the availability of artificial intelligence adoption requirements in the tax field explains 60.8% of the variations in the intention to use artificial intelligence.

3-There is a high expected benefit from using artificial intelligence in the tax field. The following are the most expected benefits ranked in descending order of importance according to the researchers in the studied sample:

a- Helps in reducing tax evasion by monitoring and analyzing taxpayers' behavior in real time.

b- Contributes to optimal segmentation of taxpayers based on their behavior, individual circumstances, demographic composition, and other characteristics.

c. Increase accuracy in tax collection and reduce errors.

d. Contributes to increasing confidence in tax administration and increasing tax revenues.

e. Improve work efficiency, speed, and simplify procedures.

f. Helps in detecting tax fraud.

4- It appears through the opinions and experience of the respondents in the studied sample that the tax administration does not have significant previous experience in using artificial intelligence to analyze taxpayers' behavior and financial situations.

5- It is evident that all study axes are available to a moderate degree, which necessitates more attention to strengthening them in order to apply artificial intelligence technology in tax administration.

a. For example, we found that the components of the nurturing environment for artificial intelligence in tax administration are available to a moderate degree, meaning that tax administration is moderately interested in areas of work development towards using artificial intelligence. The researcher believes that the nurturing environment and the role of management are among the most important foundations that should be given greater attention to develop tax work using advanced technologies.
b. The legislative and regulatory framework compatible with the use of modern technologies in analyzing customer data has a moderate strength in the Iraqi tax administration.

c. It appears that there are human resources in the tax administration with moderate qualifications to work with artificial intelligence technology, but they are capable of learning AI skills.

d. There is an adequate amount of data available to train artificial intelligence models.

6- The opinions of the sample individuals on the studied axes are similar, and there are no differences attributed to personal characteristics represented by the gender variable (male, female) and educational level (secondary or vocational, university, postgraduate), and years of experience in the tax field.

7- There are differences in the opinions of the sample individuals attributed to the degree of experience in modern technologies, and the most significant differences were that individuals with good and high experience generally had higher opinions, and that highly experienced individuals believe that there is currently a weak desire to use artificial intelligence in the Iraqi tax field.

Recommendations

In light of the previous results, the following recommendations have been reached:

1. Raise awareness among the tax administration of the importance of using artificial intelligence technology in the Iraqi tax field, and the significant benefits that can be achieved from this use.
2. Emphasize the need for the tax administration to benefit from the research and findings related to the available requirements for adopting and strengthening this technology because it is currently moderate and should ideally be good to increase the willingness for adoption.
3. Keep up with modern developments in software and advanced information systems used in analyzing and processing data to obtain instant information from all sections of the tax administration and exchange it between departments at the appropriate timing, to play its role in improving the speed of decision-making and the quality of performance of the tax administration and reducing the risks of tax evasion.
4. Train employees on using artificial intelligence software and develop their skills.
5. Review and update laws and regulations to suit the use of modern technologies.
6. Develop a national strategy for adopting artificial intelligence in taxes.

Arabic References

1. Ahmed, M. H., Mohamed Hussein, Saleh, & Amira Taha. (2018). Using expert systems in tax environment development. Scientific Journal of Research and Business Studies. Helwan, 32(2), 119-152.
2. Khedr, Saba Farouk. (2021). Tax evasion. The college of law and political science journal, (16).
3. Saif Al-Din Emad Ahmed Raouf, & Alaa Hussein Alwan Al-Shafei. (2021). The reality of the tax system in Iraq and the possibility of development 2021. Journal of Administration and Economics, (127), 152-163.
4. Aarimi, Ayad, & Shaabani. (2023). Tax administration privileges (Doctoral dissertation).

5. Abbas Mufarraj Fahl. (2023). The role of artificial intelligence in tax transactions. Al-Bahith Journal of Legal Sciences, 4(1).
6. Mubarki Mohamed Al-Saleh, Tax collection: reality and prospects, Al-Ihya Journal, College of Islamic Sciences, Batna University 1, Volume 21, Issue 2, Serial Number 29, October 2021, pp: 1075-1096

Foreign References

1. Faúndez-Ugalde, A., Mellado-Silva, R., & Aldunate-Lizana, E. (2020). Use of artificial intelligence by tax administrations: An analysis regarding taxpayers' rights in Latin American countries. Computer Law & Security Review, 38, 105441
2. Jasim, A. L. C. M. (2010). The relationship between the taxpayer and the tax administration and its impact in reducing tax evasion (Case study-Iraq). Gulf Economist, 27(19).
3. Jing-Yi, L. (2019, December). Research on the reform of tax collection and management system by artificial intelligence under the background of "intelligence+" development strategy. In 2019 International Conference on Economic Management and Cultural Industry (ICEMCI 2019) (pp. 1029-1034). Atlantis Press.
4. Saragih, A.H., Reyhani, Q., Setyowati, M.S. et al. The potential of an artificial intelligence (AI) application for the tax administration system's modernization: the case of Indonesia. Artif Intell Law 31, 491–514 (2023). https://doi.org/10.1007/s10506-022-09321-y.