THE ROLE OF BUSINESS INTELLIGENCE IN DEVELOPING TAX PERFORMANCE: AN APPLIED RESEARCH IN THE GENERAL TAXING AUTHORITY

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ABSTRACT

Objective: The present research aims at examining the role of business intelligence in developing tax performance in the General Tax Authority of a developing country.

Theoretical Framework: To enlighten the main concepts of this study and underpin their theoretical foundations, the business intelligence tools and applications were presented. Their characteristics, dimensions, virtues, as well as the reasons behind their implementation were also detailed. Therefore, the role of business intelligence in improving tax performance was justified, providing a solid basis for understanding the context of our investigation carried out in the taxing authority of the Iraqi capital.

Method: To conduct our investigation, a questionnaire was administrated to the target respondents, i.e. 97 employees of the General Tax Authority, located in Baghdad. Following the data collection process, descriptive, then regression analyses were undertaken.

Results and Discussion: The obtained findings support that business intelligence exerts a positive influence on tax performance of the general tax authority.

Research Implications: The practical and theoretical implications of this research are discussed, providing insights into the awareness of the importance of business intelligence and software applications at the workplace. Departments’ directors of the general taxing authority are invited to cooperate with the corresponding authority whose work could be better performed electronically. Decisions regarding citizens could also be taken more wisely.

Originality/Value: The relevance of the present research is essentially evidenced by its main practical implications regarding the improvement of tax performance of taxing authorities of developing countries, as well as the betterment of tax services dedicated to citizens.

Keywords: Tax Performance, Advanced technologies, business intelligence, the General Taxing Authority.

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The Role of Business Intelligence in Developing Tax Performance: An Applied Research in The General Taxing Authority

taxpeporia na melhoria do desempenho tributário, fornecendo uma base sólida para entender o contexto de nossa investigação realizada na autoridade tributária da capital iraquiana.

Método: Para conduzir nossa investigação, um questionário foi administrado aos respondentes-alvo, ou seja, 97 funcionários da Autoridade Tributária Geral, localizada em Bagdá. Após o processo de coleta de dados, foram realizadas análises descritivas e de regressão.

Resultados e Discussão: Os resultados obtidos apontam que a inteligência empresarial exerce uma influência positiva sobre o desempenho tributário da autoridade tributária geral.

Implicações da Pesquisa: As implicações práticas e teóricas desta pesquisa são discutidas, fornecendo insights sobre a importância da inteligência empresarial e das aplicações de software no local de trabalho. Os diretores dos departamentos da autoridade tributária geral são convidados a cooperar com a autoridade correspondente, cujo trabalho poderia ser melhor desempenhado eletronicamente. Decisões em relação aos cidadãos também poderiam ser tomadas com mais sabedoria.

Originalidade/Valor: A relevância da presente pesquisa é essencialmente evidenciada por suas principais implicações práticas no que diz respeito à melhoria do desempenho tributário das autoridades tributárias de países em desenvolvimento, bem como ao aprimoramento dos serviços tributários dedicados aos cidadãos.


EL PAPEL DE LA INTELIGENCIA EMPRESARIAL EN EL DESARROLLO DEL RENDIMIENTO TRIBUTARIO: UNA INVESTIGACIÓN APLICADA EN LA AUTORIDAD GENERAL DE IMPUESTOS

RESUMEN

Objetivo: La presente investigación tiene como objetivo examinar el papel de la inteligencia empresarial en el desarrollo del rendimiento tributario en la Autoridad General de Impuestos de un país en desarrollo.

Marco Teórico: Para iluminar los conceptos principales de este estudio y fundamentar sus fundamentos teóricos, se presentaron las herramientas y aplicaciones de inteligencia empresarial. Se detallaron sus características, dimensiones, virtudes, así como las razones detrás de su implementación. Por lo tanto, se justificó el papel de la inteligencia empresarial en la mejora del rendimiento tributario, proporcionando una base sólida para comprender el contexto de nuestra investigación realizada en la autoridad tributaria de la capital iraquí.

Método: Para llevar a cabo nuestra investigación, se administró un cuestionario a los encuestados objetivo, es decir, 97 empleados de la Autoridad General de Impuestos ubicada en Bagdad. Después del proceso de recopilación de datos, se realizaron análisis descriptivos y de regresión.

Resultados y Discusión: Los hallazgos obtenidos respaldan que la inteligencia empresarial ejerce una influencia positiva en el rendimiento tributario de la autoridad tributaria general.

Implicaciones de la Investigación: Se discuten las implicaciones prácticas y teóricas de esta investigación, proporcionando ideas sobre la importancia de la inteligencia empresarial y las aplicaciones de software en el lugar de trabajo. Se invita a los directores de los departamentos de la autoridad tributaria general a cooperar con la autoridad correspondiente, cuyo trabajo podría realizarse mejor electrónicamente. Las decisiones con respecto a los ciudadanos también podrían tomarse con mayor sabiduría.

Originalidad/Valor: La relevancia de la presente investigación se evidencia principalmente por sus implicaciones prácticas en cuanto a la mejora del rendimiento tributario de las autoridades tributarias de países en desarrollo, así como el mejoramiento de los servicios tributarios dedicados a los ciudadanos.

Palabras clave: Rendimiento Tributario, Tecnologías Avanzadas, Inteligencia Empresarial, Autoridad General de Impuestos.
1 INTRODUCTION

In light of the rapid progress of globalization and means of communication, business intelligence has witnessed a tremendous development. Indeed, in this contemporary digital era, it has become a lever of development for companies, as it stands behind every progress that could be achieved by them and their employees. Business intelligence is also considered as one of the key factors that support the improvement of the corporate performance of organizations, via an efficient usage of their resources, the enhancement of their employee satisfaction, and the betterment of their services/products’ quality. Business intelligence, which comprises databases, means of communication, softwares, networks, etc, helps also the progress of institutions. It is in this perspective that the current investigation sought to examine the role of business intelligence, in raising the tax performance of the General Authority of taxation.

The importance of the present research lies then in in-depth understanding the concept of business intelligence, demystifying its dimensions, as well as checking the extend of their respective influence on tax performance of the General Authority for taxes. A study undertaken by Ahmed (2023) indicates the role of business intelligence technologies, linked to big data, in the development of accounting processes. More specifically, the current investigation intends to explore the trends of electronic business and technological methods in order to specify the nature and degree of automation with information technology and accounting procedures. It is basically found on the research observation stating that the tremendous development of Information Technologies and the widespread use of electronic computers in all the fields led to a decrease of the dependence on manual accounting systems, so that they were replaced by automated programs and advanced accounting systems which are characterized by great possibilities of progress and prosperity. It is in this perspective that the current investigation sought to reach the following objectives:

1- enlightening the different dimensions related to business intelligence, which is represented by physical components, databases, communications, software, and networks, and identifying the most influential ones for the development of tax performance;
2- determining the level of commitment of the employees working in the General Authority of Taxes.

3- examining and analyzing the nature of the relationship between the dimensions of business intelligence, associated especially to technologies, softwares, and automation systems and programs, and the extent of their effects on tax performance of the General Authority for taxes.

4- checking out the role of the General Authority for taxes and the distinguished services it provides through the commitment of taxpayers, which is reflected on the tax performance of the authority.

Upon the data collection process, the final results of the present research revealed that there are many challenges related to dealing with big data. Besides, as for the study conducted by Al-Shaibani and Al-Moini (2020), it was found that the internal tax environment exerts a significant influence on tax performance of the departments and branches of the general tax authority, as depicted by its balanced scorecard. Additionally, the most important results indicated the failure of the organization to introduce automation to assess its effectiveness, internal control, and direct communication with taxpayers via Internet, especially in the branches of the authority. Moreover, findings support the evidence that there was a scarcity of funds allocated for the acquisition of automation devices. It is in this perspective that decision-makers of tax authorities are called upon to enhance their performance through the implementation of effective business intelligence tools.

2 THEORETICAL FRAMEWORK

2.1 BUSINESS INTELLIGENCE: DEFINITIONS, SCOPE, DIMENSIONS, AND VIRTUES

2.1.1 definitions Related To Business Intelligence

The emergence of automation and the technological changes have witnessed a tremendous development in this contemporary digital era, so that it has become fundamental for individuals to take advantage of those transformations at their workplace. Indeed, such changes have become more than necessary for every progress that is required for the development of the overall performance of organizations and their competitiveness. To do so, managers have also to invest and engage all the resources around them efficiently, in order to achieve the best outstanding results related to saving costs, generating an increasing efficacy,
and improving the service/product quality. According to Sundarrajan & Krishnan (2024), as well as Omrane (2022), advanced, emergent, as well as disruptive technologies tremendously contribute to drive higher creativity, productivity, and performance of firms, through evolving work practices. Moreover, it has been proved that automation helps steer organizations towards strategy. In the same perspective, the technological development, referring to several components including designs, models, techniques, and tools that are associated to data processing and conversion into information, maximizes the leverage afforded by artificial intelligence-driven innovation, to upgrade then performance and profitability of banks (Almustafa et al., 2023). It is then this mixture of activities and tools implemented in business that enable employees with accumulated experience, from different departments, to make the appropriate strategic decisions. Such a package of concrete technical instruments and activities associated to the set of common capabilities developed by individuals who are interested in exploiting them for their business, are known as business intelligence (Ashraf & Rarasan, 2018, p.3). Such a concept is also assimilated to the renewal of the potential through the usage of technical hardware techniques. It is considered a basis for storing and converting data into valuable information and transferring it to the employees of the authority as well as the external supporting bodies (Nabhan, 2020, p.56). More specifically, scholars asserted also that business intelligence helps in the introduction of new technologies to the tax authorities and their supporting entities, whose employees seek to obtain, enter, process, and output data as information to achieve their goals in the fastest possible ways.

2.1.2 The Importance And Relevance Of Business Intelligence In View Of Its Benefits For Organizations

The organization's interest in business intelligence is constantly increasing, as it is considered as an effective tool that enable organizations to gain access to data and to make the best strategic decisions for the different departments and structural layers (Al-Sharida, 2019, p. 15). The same researcher added that business intelligence helps performing the following steps: (a)-Selecting and using the useful data, which are divided into the internal ones that are circulating within the organization, and the external ones derived from the supporting bodies of the correspondent authorities. Such information enables institutions to reach the targeted objectives and get the better decisions through the capabilities of Intelligent Analysis.
(b)-Transforming those data into a business value, by connecting people, information and ideas, to make quick and reliable decisions based on important activities that are easily accessible and communicated among employees within their organizations and percussion centers.

(c)-Guiding the stakeholders by helping them for carrying out the various suitable decisions and attaining their desired goals, on the basis of the data obtained through the reports of the initial stages, and the result is the decisions of the institution and the pursuit of the desired goals.(https://www.e3rabi.com). At this stage, technological progress helps to reach the best strategic decisions. Besides, e-work for business technology is a means of progress and the uniqueness of the organization with outstanding work.

(d)-Introducing automation for knowledge and science, through which it is possible to achieve a rapid business completion. In this perspective, business intelligence systems are viewed as the basic architectures of knowledge sources that help predict the speed of completion of strategic decisions. Additionally, knowledge and various experiences play a vital role in achieving the strategic objectives of the authorities represented by innovations and creativity, and it is of great importance to serve the resources of institutions and to be more influential in innovation efforts (Mustafa Khudhair Hetal, p. 2, 2023).

2.1.3 Business Intelligence Goals

The main objective of the business intelligence system is to provide an accurate information about the organization, what is going on in its internal environment, and the extent to which it reflects its chosen strategy (Al- Khasawneh, 2020). It involves the following steps:

(a)Tracking the technological progress and trends in order to stand up to the filter of technical works in the interest of the taxpayer; which enhances the procedures in force in the units and departments of the state.

One of the main obstacles in the exercise of the job, and thus the progress of performance, is associated to the lack of technical equipment, which is represented by the process of an optimal use of business intelligence and automation, computers and administrative devices that provide services to taxpayers. the lack of experience and the appropriate educational level of the personnel working in the authority might also lead to the inability to deal with the technological methods. Moreover, the lack of organizational strategies
or a clear management philosophy might lead to hindering the dissemination of knowledge and sending it to the unit (Al-Khasawneh, 2020).

(b) Communicating with the taxpayers and providing them with all the services, so that the mechanism of communication and coordination between the authority and the supporting bodies could be achieved.

Indeed, the presence of a technologically advanced communication network, and specific mechanisms of tax legislation, rules, procedures and annual controls, will enable business intelligence and technology to crystallize these legislations, rules and procedures in an electronic form with which the fairness of measuring income will be achieved and will result in income consolidation and taking into account everything that is being done on the taxpayer's income (Muhammad et al, 2013, p. 211).

(c) Increasing the expenses for all the parties and attaining better incomes from the state's business activities (Roger, 2010, p. 23).

2.1.4 Dimensions Of Business Intelligence

Business intelligence comprises the following different dimensions:

(a) Physical components and devices: they correspond to the tools represented by a group of computers of various types or sizes and speeds, as well as all the accessories of devices and computers, used for data processing. Such devices represent one of the pillars of organizational development, as they help ensuring the work and preventing monotony among workers (Zakaria & Shariff, 2011, p.62; Zuppo, 2012, p.16)

(b) Softwares: It can be used to control and apply the computational programs to find out the best solutions to the existing problems. The software plays also an important role in managing the resources of the physical devices, such as the central telecom operator and the other associated devices, including the operating systems and the communication programs, such as MS-DOS and Windows.

As for the application programs, software represent the basics of computers and they send devices to perform data operational activities, comprising: the computer’s writing programs, as well as the rules that are considered as one of the flexible basics through which the required data is retrieved and stored via central storage media, then updated on a continuous basis and accessed by the authorized persons (Holagh, 2015, p.214).

(c) Databases: it represents the data that is stored on computers in the hard and floppy disk players, and whose purpose is to collect, classify, save, and return the information
belonging to the economic units, and at the appropriate speed, whenever it is necessary (Fridawati et al., 2019, p.695)

(d)-Communication tools: such tools encompass all the mental devices and software that connect the different parts of devices that release data and its results and transfer information from one physical location to another to participate in audio, image and video. They also incorporate the rapid means of communication that are used to accelerate the remote distribution, shorten the distance between individuals, and make the whole world as one village. (Laudon&Laudon,2014, p. 51).

In the same perspective, the process of receiving and sending data through communication networks is prepared and the transfer process is controlled via the communication protocols and programs (Nouri and Juma, 2015, p. 156).

(e)-Networks: those networks assist with quickly transferring information extracted from hardware and software. In this regard, the abundance of communication skills in organizations, help in gaining a considerable experience and providing the appropriate services (Whyte & Hennessy, 2017, p.18).

Figure 1

*Dimensions of business intelligence*
2.1.5 Requirements And Conditions Regarding The Business Intelligence Implementation

According to many researchers, such as Turban et al. (2008), Mohammed et al. (2013, p. 199), as well as Al-Obaidi (2023, p. 462), the entities that seek to introduce technologies and digital tools at the workplace and employ them for their businesses seek to take advantage of them, through the following actions:

(a) -The implementation of effective communication systems between the departments and units of the internal organization and its supporting bodies to serve the objectives of the organization.

(b) -The introduction of increasing volumes of big data in easily accessible places and small spaces, so that its users could easily obtain it at the best time.

(c) -The rise of the efficiency and effectiveness of the workers ‘groups wherever they are located (in one or several place(s)).

(d) -The operationalization of semi-automated work processes and tasks performed manually or automatically.

(e) -The identification of the first-hand errors in order to process and control them.

(f) -The submission of the required statements (including the tables of expenses and incomes) with accuracy and at a high speed, in addition to the establishment of digital accounts in large sizes.

2.2 TAX PERFORMANCE: DEFINITIONS, DIMENSIONS, OBJECTIVES, AND DETERMINANTS

2.2.1 Tax Performance: Meaning And General Scope

Tax is one of the most important sources of public revenues for the state. It contributes significantly to its economic development through achieving all its financial goals (Al-Sharea et al. 2020, p.532), and attaining the best targeted results by the tax administrations (Al-Khafaji, 2023, p. 125).

The operational audit is one of the basic concepts of business organizations of different nature and tasks. It focuses on three fundamental aspects that are linked to the performance of the economic units, namely the economy, efficiency and effectiveness of results are very important for the continuity of the organization (Nahla Ghalib, Abdul Rahmaa, et al., 2020, p.1283).
For Alijaber Tayh Albderi, et al. (2023, p.3), tax performance reflects the applied dimension of the unit and it translates the performance of employees so that they become able of using the resources of the enterprise in modern scientific-technological ways and exploiting them efficiently and effectively. By doing so, the organization might raise the level of its performance in new ways that are consistent with the technological developments, which results in increasing revenues and working to satisfy taxpayers. In this perspective, it is important to mention that the tax performance is represented by two essential factors: a good performance factor in the use of management resources. The effectiveness factor of the goals achieved from that use, performance is to judge the management in terms of its ability to achieve its goals. It is defined as a reflection of the actual picture of the tax administration's exploitation of human resources and efficiency effectively in order to achieve the goals and achieve its desired goals. (Sharqi, 2016: 34) and using all the means provided by business intelligence, so that the organization can reach the assigned goals at the lowest cost and effort. Good management and exploitation of fraudulent resources is the main challenge faced by most departments within the units, and not the degree of possession of Natural Resources. (Hassnain Raghib Talab et al., 2018, p. 10517).

On the other hand, many scholars asserted that tax performance refers to the best means that is used by the tax administration to find out the level of the enterprise within a limited period, use resources, apply regulations, and system laws, and for the organization to implement its functions to achieve tax goals, through the usage of business intelligence and advanced technological means and methods that assist in providing services to taxpayers efficiently. The performance is effective if the tax policy, the regulations, and the applicable laws have the ability to raise revenues to strengthen the state treasury.

2.2.2 Tax Performance Goals

The goal of the tax administration is to achieve a set of goals related to tax performance, as it is the first step to achieve them, and increasing the experience and knowledge of employees enables them to achieve the goals of the authority, as well as work on contracting with others, making decisions, or changing important activities. It is represented by the following points:-

(a)-The duties and responsibilities of each of the units and departments in the authority are determined to find out the weaknesses by reviewing the production of each department in the tax and knowing the advantages and weaknesses, and thus each department strives in the competition, which enhances raising the level of performance of employees.
(b) - The use of resources within the organization, in a rational way, achieves an increase in tax revenue with minimal costs.

(c) - Developing a training program in advanced modern ways, encouraging employees to improve their performance and develop their actual abilities.

(d) - Designing a large database, which is used in scientific plans and policy making, and is a step to correct mistakes in the authority, and increase performance, in addition to the possibility of change and rotation in the jobs of employees. (Wheelen and Hunger, 2004, p.221; Gether and Ramadan, 2014, p. 122; Al-Azzawi et al.,2020, 2021).

2.2.3 Factors Affecting Tax Performance

There are numerous factors that could affect tax performance of the authority's employees. They could be classified into organizational/administrative ones, human ones, and external (social, economic, and political ones). Those factors could be enumerated as follows:

(a) The organizational/administrative factors: Such factors include:

- **Climate**: the lack of a suitable climate and atmosphere that stimulates production in the tax authority.
- **Conflicts**: occur between employees and their officials and between employees and their peers.
- **Accuracy**: inaccuracy in determining the responsibilities assigned to each employee.
- **Lack of supervision**: by managers on their employees.
- **Failure**: which occurs during the training of employees.
- **Duties**: lack of independence in the assignment of duties and works to each individual employee.
- **Specialties**: lack of material resources and failure of the budget to arrive on time. (Alribaq, 2012, p. 46)

(b) The human factors: those factors involve:

- **Lack of specialization**: being limited to existing employees in the Organization, and not attracting individuals, which causes the accumulation of work.
- **Inaccuracy**: lack of accuracy and fairness in setting the foundations and standards when distributing incentives, to distinguish them from the performance of others, represented by their efforts, seniority, and skills.
- **Lack of cooperation**: lack of the spirit of cooperation, loyalty, and commitment between individuals.

- **Lack of skills**: lack of development of skills, competencies, and knowledge. (Dora., et al., 2010). For Amal (2023, p.62), it is necessary to review the performance expectations with employees at workplace, in order to undertake personnel actions that reflect the final results they aim at achieving.

**2.3 BUSINESS INTELLIGENCE AND THE BENEFITS ASSOCIATED TO ITS IMPLEMENTATION INSIDE ORGANIZATIONS/ADMINISTRATION**

**2.3.1 Business Intelligence And Advanced Technologies And Their Overall Benefits For Organizations**

The role of business intelligence lies in the speed of business completion with less efforts and costs through the following points:

(a) It helps to update the services provided to the taxpayer.

(b) It works to provide data accurately and with less time and effort.
(c) It improves the performance of employees by increasing efficiency and effectiveness as the working people are arranged as groups if they are in one place or different places. (Turban et al., 2008)

(d) It contributes to identify and address errors before they become aggravated.

(e) The development of technology has come to keep pace with the different situations in the country.

(f) It reduces costs by improving the efficiency of operations.

(g) Its employment has a great role in creating reports and statements accurately and quickly, and doing digital calculations in large volumes and very quickly. The types of intelligence that leaders of organizations classify with future visions, abilities, creativity, and intuition (Al-Azzawi et al., 2021, p.1).

The tax administration is one of the beneficiaries of the data that it uses in the mechanism of accounting for taxpayers as a basis for calculating tax income (Abdulrahman, al-Yasiri, 43:2019), which are features that should be characterized by the information of the economic unit (Khudair, 2023: 378)

(h) Business intelligence, in addition to advanced technologies, might increase the production capacity as well as the speed of decision-making (Filippov & Lastre Bova, 2010, p. 2).

It has a role to expand the flexibility of the enterprise by speeding up the processing of data to encourage the conditions of the external environment (Lu & Ramamurthy, 2011, p. 934; Muhammad et al., 2013, p. 199).

2.3.2 Business Intelligence And Its Virtues For The Administration Through The Improvement Of Tax Performance

The benefits acquired by the administration, as a result of the introduction of electronic work in the authority, and the improvement of tax performance are in accordance with the following points:

(a) The tax administration has a basic information base, that relies on accurate data, and is able to update it continuously. It works also on arranging and organizing the data of taxpayers by (categories, sectors, and geographical scope), as well as preventing duplication and making mistakes due to the similarity of the names of the taxpayers, to the ability of the system to use one number for all transactions of the taxpayer. The use of advanced technologies and networks is achieved by enabling public access to...
information (Hassnain, 2018, p. 10518). Moreover, employees and business intelligence personnel is capable of fulfilling their responsibilities for support and alignment (Hassnain, et al., 2023, p. 2).

(b) Business intelligence fosters networking: it helps in easy communication, communication and data exchange between departments and then, follow-up and control all transactions, data, information, volume and movement of taxpayers’ activity, obtaining data quickly and with high accuracy, and obtaining statements on time, it also provides the possibility of networking with the relevant authorities in the future, supporting entities, and easy matching activities provided by taxpayers with what is available at the tax administration.

(c) Business intelligence supports the administration to know the level of awareness of taxpayers who are obliged to file their returns by knowing the percentage of voluntary compliance and working to change policies and procedures in the event of a decrease. The system automatically calculates legal fines for taxpayers who fail to file their tax returns on time, as well as calculate the incentive to file an annual income declaration automatically. The impact of tax on the voluntary compliance behavior of taxpayers is greater than the impact of tax rates (Ahmed, 2023, p.311)

(d) Through laws, rules, standards, and annual controls, business intelligence helps to increase confidence, transparency, and flexibility between the authority's employees and taxpayers to facilitate tax accounting procedures automatically and not subject to personal whims and to select the declarations submitted by taxpayers on the legal date according to the rule of self-linking automatically.

(e) The application of business intelligence and technology helps to facilitate the process of direct deduction and addition, determine the amounts collected under the commercial profits tax account, find out the amount of revenue (tax revenues) expected to flow to the state treasury according to the data and information associated with it, and notify management in executive offices of the dates of scheduled tax installments and work to organize them automatically. Knowledge is one of the most important resources of the organization, despite the possession of technical devices, in addition to a variety of basic knowledge, such as the use of devices such as the use of computers and understanding the basics of tax systems, and this creates a level of tax knowledge for taxpayers, and that the applicable regulations and laws have the ability to increase tax revenues to finance the public treasury (al-shareea et al., 2020:p.22). The diversity and development of electronic transactions requires the regulatory authorities to keep abreast of these
developments to ensure the proper conduct of transactions through electronic monitoring (Al-Fadhli, Al-Mamouri, 2022: 512).

(f) Familiarizing the tax administration with electronic reports will represent an auxiliary factor in monitoring the performance of tax departments and correcting deviations first-hand, and making sure that the achievements are consistent with plans, and therefore knowing the achievements of procedures, and the outcome, for justice in evaluating their performance according to their achievements, and monitoring the integrity of tax linking and collection procedures, to reach a sophisticated tax performance. (Al-Harawi, 2018, pp. 63-66) as in Figure (3).

Figure 2

*Business intelligence and the benefits of its implementation on tax performance*

3 RESEARCH METHODOLOGY

The use of forms through the processing and analysis of information.
3.1 ANALYSIS TOOLS AND INSTRUMENTS

The questionnaire was administrated to the interviews during two months, lasting from (1/06/2023) to (30/7/2023) and its content is structured into (20) paragraphs associated to the assessment pf business intelligence, tax performance, and the relationship between them.

For more precision, business intelligence, which is the independent variable, was assessed by its five dimensions (physical components, databases, communications, software, and networks), whereas the dependent variable, which is tax performance, was measured the basis of its , and Figure (1) shows this.

Figure 3
Research model

![Research model diagram]

Source: Researchers’ elaboration

3.2 POPULATION AND SAMPLE

The random sample is relied on to test hypotheses from the study community in the commission, represented by holders of the following certificates (PhD, Master, higher diploma, bachelor, preparatory and above), as well as because of the difference in the study community, and also for the accuracy of the results and reliability, considering that these certificates are closer to the subject of study, according to the statistics of the commission, the
size of the community was (140) individuals, but the sample size was determined by the Model (D. Morgan Global; at the limit of (0.05) , up to (0.01), if the sample size was (103) and the percentage was (74%) of the total community, as below.

Table 1

Table for determining sample size from a given population

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<td>1300</td>
<td>297</td>
<td>7000</td>
<td>364</td>
</tr>
<tr>
<td>50</td>
<td>44</td>
<td>190</td>
<td>123</td>
<td>420</td>
<td>201</td>
<td>1400</td>
<td>302</td>
<td>8000</td>
<td>367</td>
</tr>
<tr>
<td>55</td>
<td>48</td>
<td>200</td>
<td>127</td>
<td>440</td>
<td>205</td>
<td>1500</td>
<td>306</td>
<td>9000</td>
<td>368</td>
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<tr>
<td>60</td>
<td>52</td>
<td>210</td>
<td>132</td>
<td>460</td>
<td>210</td>
<td>1600</td>
<td>310</td>
<td>10000</td>
<td>370</td>
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<tr>
<td>65</td>
<td>56</td>
<td>220</td>
<td>136</td>
<td>480</td>
<td>214</td>
<td>1700</td>
<td>313</td>
<td>15000</td>
<td>375</td>
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<tr>
<td>70</td>
<td>59</td>
<td>230</td>
<td>140</td>
<td>500</td>
<td>217</td>
<td>1800</td>
<td>317</td>
<td>20000</td>
<td>377</td>
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<tr>
<td>75</td>
<td>63</td>
<td>240</td>
<td>144</td>
<td>550</td>
<td>225</td>
<td>1900</td>
<td>320</td>
<td>30000</td>
<td>379</td>
</tr>
<tr>
<td>80</td>
<td>66</td>
<td>250</td>
<td>148</td>
<td>600</td>
<td>234</td>
<td>2000</td>
<td>322</td>
<td>40000</td>
<td>380</td>
</tr>
<tr>
<td>85</td>
<td>70</td>
<td>260</td>
<td>152</td>
<td>650</td>
<td>242</td>
<td>2200</td>
<td>327</td>
<td>50000</td>
<td>381</td>
</tr>
<tr>
<td>90</td>
<td>73</td>
<td>270</td>
<td>155</td>
<td>700</td>
<td>248</td>
<td>2400</td>
<td>331</td>
<td>75000</td>
<td>382</td>
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<tr>
<td>95</td>
<td>76</td>
<td>270</td>
<td>159</td>
<td>750</td>
<td>256</td>
<td>2600</td>
<td>335</td>
<td>100000</td>
<td>384</td>
</tr>
</tbody>
</table>

Note: "N": Population size; "s": Sample size.

As shown in Table 2, below, (103) questionnaires were administrated to participants, but the filled ones were (97); which supports that the response rate was 94 %;

Table 2

Description of the sample through the distributed forms

<table>
<thead>
<tr>
<th>Sample community</th>
<th>Number of distributed forms</th>
<th>Number of received forms</th>
<th>Response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Authority of Taxation</td>
<td>103</td>
<td>97</td>
<td>94%</td>
</tr>
</tbody>
</table>

It should be also noticed hereby that the Likert scale was employed to determine the participants’ answers, ranging from ‘1’ for "strongly disagree” to ‘5’ for "strongly agree”, as detailed in Table. 3 below.
Table 3

\textit{Answers’ form}

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: EPIC (2010, p. 61).

3.3 MEASURE RELIABILITY AND CONSTANCY

To check the reliability of the measurement scale of the present study, few steps were performed.

3.3.1 First step: the reliability test

The first necessary amendments were performed to the questions included into the first version of the questionnaire. Indeed, the interviewees of the first pre-test sample proposed few changes in the wording and order of questions submitted by the researchers.

3.3.2 Second step: the stability test

The study used the Likert scale to test the questions according to the Cronbach-Alpha equation, as in the Likert ladder test, (Al-Jadiri and Abu Helou, 2009, p. 171).

3.4 THIRD STEP: DATA ANALYSIS AND PROCESSING

The researchers focused on the three following main steps:

3.4.1 Descriptive statistics

Regarding the descriptive analysis, the following formulas were applied:

A-Frequency distribution, and percentage

B-Arithmetic mean: \( X = \frac{1}{n} \sum_{i=1}^{n} x_i \) \( \frac{n}{n} \)

C-Standard deviation: \( S = \sqrt{\frac{1}{n-1} \sum_{i=1}^{n} (x_i - \bar{x})^2} \)

D-Coefficient of variation: \( (C.V) CV = \frac{S}{\bar{X}} \times 100 \)
3.4.2 Inferential statistics

As for the inferential statistics, the formulas related to the person correlation, to the regression analysis, and marginal inclination were applied as follows.

A-The coefficient of reliability (Cronbach Alpha)

B- Pearson correlation coefficient: 

\[ r = \frac{\sum_{(i=1)}^{n} \left( (x_i - \bar{x}) (y_i - \bar{y}) \right)}{\sqrt{\sum_{(i=1)}^{n} ((x_i - \bar{x})^2) \sum_{(i=1)}^{n} ((y_i - \bar{y})^2)}} \]

-1 ≤ r ≤ +1

C-The simple linear regression formula

Fixed limit \[ b_{(o)} = y - b_{(1)} x \]

D- The Marginal inclination

\[ b_{(1)} = \frac{\sum_{(i=1)}^{n} (x_i - \bar{x})(y_i - \bar{y})}{\sum_{(i=1)}^{n} (x_i - \bar{x})^2} \]

3.4.3 Ready-made statistical program (Spss-V.19): to extract the results, the SPSS software was used.

4 RESULTS AND DISCUSSIONS

4.1 TESTING OF THE PRINCIPAL HYPOTHESIS ASSOCIATED TO THE CORRELATION BETWEEN BUSINESS INTELLIGENCE AND TAX PERFORMANCE

The main correlation hypothesis is formulated as follows: (There is no statistically significant correlation between business intelligence X and tax performance Y).

Through Table No.4, it could be noticed that there is a statistically significant and positive correlation between business intelligence and tax performance, with a percentage of (0.852)**. Indeed, as depicted in the table below, the main hypothesis of correlation is rejected and the alternative hypothesis is confirmed, ensuring that there is a statistically significant positive correlation between business intelligence X and tax performance Y, reaching the value of (0.01).

<table>
<thead>
<tr>
<th>Table 4</th>
<th>Correlation between business intelligence (X) and tax performance (Y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business intelligence X</td>
<td>Tax performance</td>
</tr>
<tr>
<td>-------------------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>0.852**</td>
<td>**. Correlation is significant at the level of 0.01 (2-tailed).</td>
</tr>
</tbody>
</table>

4.2 HYPOTHESIS’ TESTING REGARDING THE INFLUENCE OF BUSINESS INTELLIGENCE ON TAX PERFORMANCE

The main (effect) hypothesis could be formulated as follows: (there is no statistically significant effect of business intelligence (X) on tax performance (Y)).

Through the analysis, it could be deduced that:

The calculated (F) was (348.318). It is then higher than the tabular (F) whose value is (6.84) at a significant level of (0.01). Therefore, the hypothesis of nothingness is rejected; whereas the alternative hypothesis traduced by (“there is a statistically significant effect of business intelligence on performance” is accepted.

We can therefore conclude that the advanced technologies associated to business intelligence affect 72.7% of tax performance levels, as $R^2$ is worth (0.727). The remaining percentage of (27.3%) is not included in the final result of the research. The marginal slope ($\beta$) value is of (0.950), and the value of (t) amounted to (18.663) is higher than the tabular (t) at the level of (1%). It amounts to (2.36), and (α) is equal to (0.256), which is not significant. The calculated (T) for (1.290) is lower than the tabular (t) at the limit of (5%) and it was (1.66), which means that when business intelligence is equal to zero, tax performance does not decrease from this value.

4.3 HYPOTHESIS’ TESTING REGARDING THE NON-MULTIPLE EFFECT

The non-multiple effect is reflected by the fact that: (there is no statistically significant effect between the dimensions of business intelligence combined together in tax performance).

Table 5

<table>
<thead>
<tr>
<th>Decision</th>
<th>Moral</th>
<th>F Calculated</th>
<th>Coefficient of determinatio n</th>
<th>R²</th>
<th>Moral Calculated</th>
<th>Regressio n coefficient s</th>
<th>Business Intelligence (X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.000</td>
<td>74.54 6</td>
<td>0.746</td>
<td>0.068</td>
<td>1.844</td>
<td>0.367</td>
<td>Fixed limit</td>
<td></td>
</tr>
</tbody>
</table>
Table 5 illustrates that the value of (F) calculated for the Model is (74.546). It is higher than the tabular (F), which is (3.17) at a limit of (1%), and with two degrees of freedom (5,127). Accordingly, the corresponding hypothesis is to be rejected, and the alternative one (There is a statistically significant effect among business intelligence with its dimensions in tax performance) is to be accepted. Such a finding indicate that the dimensions of business intelligence have an effective and significant impact on tax performance. It implies that, when the organization pays a specific attention to all the dimensions of business intelligence simultaneously and without favoring one over the other, its performance will be holistically improved.

As for (R²) represented by the value of (0.746), it highlights that the dimensions of business intelligence and its percentage (74.6%) are making a difference on tax performance. whereas the remaining percentage (25.4%) is related to other variables that are not included in the current research model. It turns out that (β) for all the dimensions (i.e. devices, softwares, databases, and networks) are respectively (0.280, 0.154, 0.199, 0.273). Besides, their corresponding calculated (t), represented by (5.116, 3.154, 2.607, 4.363), is higher than the Tabular (T) at the levels of (1%, 5%) and the amounts ranging from (1.66) and (2.36). Similarly, findings reveal that (β) for (Communications) is (0.015), and its calculated (t) is (0.207), so lower than the Tabular (t ) at the level of (5%) and the amount of ( 1.66). On the other hand, the value of the constant (α) was recorded in the equation with a value of (0.367); the calculated (t ) was (1.844), so higher than the tabular (t ), at the level of (5%) and the amount of ( 1.66); which implies that as long as business intelligence with its combined dimensions is equal to zero, tax performance will not decrease below that value (0.367).

<table>
<thead>
<tr>
<th>Accept the hypothesis</th>
<th>Devices( Z1)</th>
<th>Software (Z2)</th>
<th>Database (Z3)</th>
<th>Telecommunications (Z4)</th>
<th>Network s( Z5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 2</td>
<td>5.116</td>
<td>0.280</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.01 0</td>
<td>3.154</td>
<td>0.154</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.83 6</td>
<td>2.607</td>
<td>0.199</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.00 0</td>
<td>0.207</td>
<td>0.015</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.363</td>
<td>0.273</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sample=132 // 1.66 , 2.36=Tabulated (t) value/ 3.17 =Tabulated (F)value
5 CONCLUSION

The present investigation aimed at testing the effects of business intelligence and its associated technologies on tax performance in a developing country: Iraq.

5.1 MAIN IMPLICATIONS

After the entry of many foreign companies, including multinational telecommunications’ enterprises based on the grants offered by the legal legislation under Law No. 13 of 2006, the implementation of modern technologies associated to national Iraqi companies is becoming more than necessary. More specifically, the usage of manual/old methods, as well as complicated and inaccurate procedures by taxpayers who sought to submit their declarations and activities to the tax authority engendered a lot of efforts, costs, time, and tax revenues in most branches of the authority of the Iraqi context. That is why, the present research aimed at highlighting the emergent need of affording highly-qualified personnel who is able to deal with advanced technological devices, in order to efficiently apply business intelligence inside the Iraqi organizations and administration. Appropriate courses on business intelligence and related new technologies should be dedicated to the employees of the authority and its branches, in order to enhance their development and participation for the purpose of promotion and changing job titles.

The attained results of the current investigation indicated that there is a positive (direct) relationship (with a statistical evidence) between business intelligence and tax performance, showing up the vital role of business intelligence in improving and renewing the administrative methods that contribute to raising the level of tax performance in the Iraqi context. Moreover, findings reveal that there is a multiple effect of the dimensions of business intelligence (i.e. physical components, databases, communications, softwares, and networks) on the tax performance of the authority.

5.2 MAIN RECOMMENDATIONS

Based on the essential results stated above, it appears that business intelligence should be applied to the authority's units and tracking developments, to make tax procedures more accurate, as well as to enhance the tax performance of organizations in the Iraqi context.
Accordingly, and more precisely, the most important recommendations could be outlined as follows:

- Sustaining professional efforts to encourage specialized employees in electronic systems to work with automation and software systems. Therefore, specific mechanisms should be developed to train the staff of the authority on the electronic approach that coexists with modern developments. By doing so, the level of performance for this modern work could be improved through the opening of scientific courses and introductory seminars as well as participation in courses outside the country to adopt new technological ideas.

- Encouraging taxpayers to start working on automation and modern applications in the work of the authority by creating communication networks to send their data and activity to the Tax Authority, which might reduce time and efforts and increases the tax yields.

- Conducting a continuous updating of the dimensions of business intelligence (physical components, databases, communications, softwares, networks) and working on their development, as the importance of business intelligence derives from the development of tax performance. In fact, implementing business intelligence and advanced technologies in the department of senior income taxpayers might contribute to get rid of the mistakes that the employees of the authority are exposed to make, by avoiding redundancies in administrative work and data entry and analysis. This might also help reduce time, as well as the speed and ease of data access from taxpayers, to make fair decisions regarding tax imposition.

- Developing a mechanism to prevent delays in the manual completion of the assessment of corporate profits tax, and raise the efficiency and performance of employees, in a manner that ensures obtaining the confidence of taxpayers. Working with advanced means of collection and modern technologies, and providing companies with a patent might also contribute to upgrade organizations’ tax performance.

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