BUILDING AND EVALUATING A MODEL TO REDUCE TAX EVASION USING BLOCKCHAIN TECHNOLOGY (INCOME AND SALES TAX DEPARTMENT OF JORDANIAN)

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Abstract

The study aims to build and evaluate a model which reduces Tax Evasion by using Blockchain Technology, in line with the tremendous technological developments , and as a modest attempt in presenting a model, that solve a persistent problem which is Tax Evasion in accordance with many methods , where Tax Evasion divided into two sections, the first one is about evasion methods from Income Tax , The second, relates to evasion methods from Sales Tax), and to achieve the goal of the study, the Descriptive Analytical Method was used. Where the form was built in its theoretical version .The Preliminary data was collected using the questionnaire for model evaluation ,where The personal interview was also relied upon to collect some important data for the study that were not included in the questionnaire. The study concluded that a model can be built using the block chain technology, and that this model leads to a reduction in tax evasion of income and sales taxes. As well, the study recommends presenting the study model to the Income and Sales Tax Department to study the possibility of adopting and applying it , in addition to help solving the problem of tax evasion, whether at the income tax level or at the sales tax level.

Keywords: Blockchain Technology, Tax Evasion.

INTRODUCTION

The world is experiencing a huge technological revolution, which Blockchain considered as one of its leaders. Where this revolution may change the cognitive human perspective towards things in general. Moreover, the world is about to convert from information (computer) generation to next-generation information,   instead of the appearance of a hyper- intelligent community in which the upper hand is for the machine over the human. The most notable developments is Blockchain technique, or so- called the decentralized distributed general ledger, which allows the circulation of anything of value in a safe and transparent way without the risk of manipulation, in addition to have the ability to provide reliable information in conjunction with the real time of the occurrence of the process (Alarcon,2018) to all persons on the network, as the openness and development Technology in the world requires the state to find effective means to confront the problems that it suffers from, and among these problems is what is known as Tax Evasion, which may result from weakness in the systems in place, which depend on the taxpayer to provide data to the tax department, which provides an opportunity for the person charged with evasion.

As a result of the previous, the available information is lack of reliability and transparency, which leads to lack of the state revenues from receipts tax. This would have constituted a high risk on the national economy, which leads to a failure to provide planned services to citizens

(Alhadidi, 2017).This makes it critical that the government should keep up with the technological developments; which this phenomenon can be solved significantly, or at least a big part of it such as: to apply Blockchain technology, in which it can be what the tax world are waiting for , in addition to what this technology can offer starting from storage, And to verify the validity of transactions and track them by distributing the databases to those in the network with a high degree of encryption, which may be impossible to penetrate in a decentralized manner (Mendonca,& varsha,2018) and with a high degree of reliability and transparency, Since the establishment of the Blockchain system and Ensuring the enforcement of it in which Tax makes the process of tracking operations and companies, collecting tax receipts , and ensuring the correctness of the taxpayers' data easier , because this technology is based on tracking the data source. That makes the researchers cares to make a connection between the Blockchain and Tax Evasion in a trial to build a model based on blockchain, the aim of which is to reduce the Tax Evasion.

Where the study aims to build a model using Blockchain technology, the aim of which is to reduce Tax Evasion, and the study gains its prominence in providing a model which consistent with the rapid emergence of technologies, new business models and tremendous technological developments, which is known as Blockchain to be used in reducing the problem that is classified as a problem It is old and modern, which is Tax evasion, which was and still is costing the country a lot of lost revenue.

Tax Evasion Concept

Tax evasion is defined as an illegal act (Backman, 2017) of Failure to comply with any related Tax legislation (Drogalas, et.al, 2018), which is the failure unpaid any related tax obligation (Drogalas, et.al, 2018) such as concealment of taxable income or profit. By overestimating discounts or exemptions (Khlif & Amara, 2019), which leads to a failure to provide planned services to citizens (Alhadidi, 2017).

To give brief remarks to what has already been said, Tax Evasion is the contravention by the taxpayer of the provisions of the law, which stipulated by following ways and methods that lead to escaping from paying the consequent tax towards the state, which leads to serious consequences, for economic development in both developed and developing countries, where there is an inverse relationship between Tax evasion and economic development. The less tax evasion leads to a refresh of the economy (Bethencourt & Kunze, 2018), and Liu (2018) added that it has negative effects on the fair income distribution.
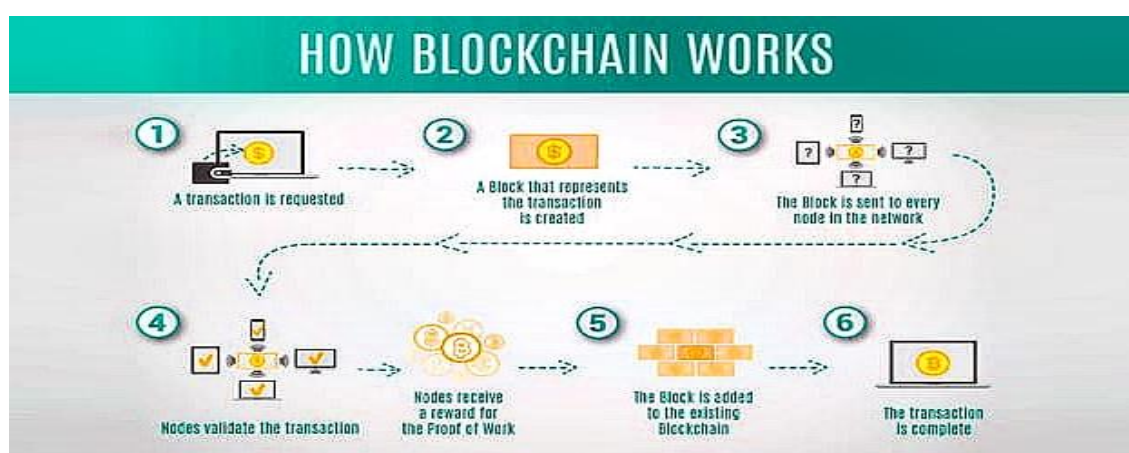
The Concept of Blockchain

It's the mutual list that's been continuously verified (Ayre and Craner, 2018) which is considered as an encrypted Decentralized general ledger that contains a digital record of common the transactions accessed throughout a public or private network (Mendonca & varsha 2018) all servers on the network has a copy of the data , as all data is being copied into all servers in the actual time for the operation , (Alarcon, 2018) each server has access the entire transactions record with ability to verify all records (Bodo,2018) as each record is recorded timely and has an encrypted signature which makes the general ledger historically recordable

and unmodifiable for all transactions in the network (Novotny, 2018) which guarantees the transparency , accessibility and stability of the transactions record by transmitting the operations to all the blocks then adding it to the database (Cuccuru,2017) where the block is considered as a type of data files with a timestamp that connects each block to the previous one (Benchoufi & Ravaud,2017).

A clarification of the above the block chain is a type of decentralized database that allows transactions and digital currencies circulation (anything valuable) away from the danger of manipulation and penetration, this is due to the ability of this technique of providing each individual with a copy of the system by linking every block with another which is called Hash which is a functions that transforms letters and numbers into an encrypted combinations with a fixed length established using algorithms , it's considered very necessary for managing the blockchain (frankenfield,2019) for example : #19F357B25 , there is no way to apply any modifications on data incase its recorded into the chain by any party whatsoever , Lawlor(2018) confirmed it , the moment the deal is entered and published into the chain no modifications can be applied, which allows the accessibility to anything that's been added to all blocks simultaneously with the accruing of the operation safely and transparently, Khalifa(2018) pointed out that the blockchain meanwhile is considered as the largest database distributed between individuals in the whole world.

The working mechanism of the blockchains will be clarified throughout the illustrated example in the next form. The following figure represents the work mechanism of Blockchain technology... first of all, the transaction is requested, then the transaction will be presented as a block through the internet and then transmitted to all participants in the distributed network to get their approval on the validity of the transaction afterwards the block is added to the chain which leads to an open, transparent record for the transactions to get the transaction done eventually (shaikh&Lashari, 2017)

Figure 1: The working mechanism of Blockchain

Source: netaawy (2018) https://images.app.goo.gl/NZheuQt9AoW31hBNA
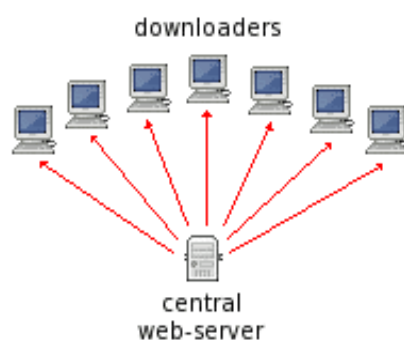
The Features of Blockchain

There is a variety of features for the blockchain, where we will focus on its most notable feature and they are:

1. **Quality assurance:** the system of blockchain validates the ability of tracking every step regarding the transaction, which guarantees providing services in high quality which facilitates firms operations on making investigations and applying the necessary proceedings (Agrawal, 2018).

2. **Decentralization :** which indicates that the chain lacks a third party to check the transactions (Williams,2017) using the distributed decentralized general ledger which records every transaction done by the parties in a single ledger (Uysal,2018) this ledger is not owned or controlled by a single party , control is rather distributed to all parties on the network (Ovenden,2017) which assures the transparency of data because this Technique is protected from deleting , manipulation and forgery of data(Iansiti,Lakhani,2017) , as for the affection of this technique on accounting (Patil,2017) has assured that because of this technique the Auditors and auditing companies will be dispensed .

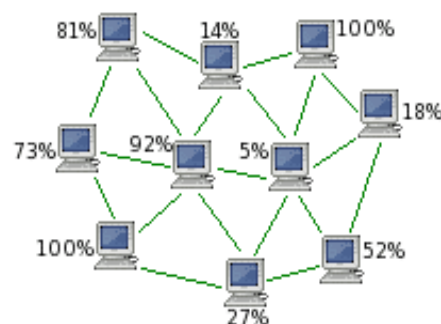The next shape illustrates the difference between a centralized and decentralized database (Rosic, 2019)

Figure 2: difference between centralized and decentralized database

Traditional Centralized Downloading

downloaders

central web-server

- Slow
- Single point of failure
- High bandwidth usage for server

Decentralized Peer-to-Peer Downloading

81% 14% 100%
73% 92% 5% 18%
100% 52%
27%

- Fast
- No single point of failure
- All downloaders are also uploaders

3. Smart contracts: represented in the computer programmed contracts which are stored inside the blockchain and can be automatically activated in case it fulfills certain conditions, the most common use of smart contracts is supply chain management (SCM) (Zofort,2018)

For example: instead of using multiple systems, smart contracts can be prepared in the blockchain by sharing the significant information such as sales data stock levels, order and shipping information (Holder,2018) also the ability of tracking goods to execute Contractual obligations respective to the distribution system and determine whether the distribution system has any gaps or not (clack 2018)

4. Reducing Costs : this is applied through minimizing cases of fraud and assets robbery signifying, by tracking and auditing one of the origins there will be need for phone call and emails costs etc.…(Rosenberg,2017) this is inflected of minimizing the need of manual interaction in collecting modifying data and sharing it (Gregorio,2016)

Based on a study made by Santander FinTech company the distributed general ledger technology can decrease the cost of the infrastructure for financial services between 15 billion dollars to 20 billion annually by the year of 2022 (Perez 2015) , as an example of it what's been mentions in **(Heitner 2018)** that applying the blockchain technology by the Saudi company Aramco will achieve savings in the costs with not less than 5% , also the general cost can be decreased by automating the main services such as legal costs like framing lawyers contracts and other accounting expenses using smart contracts.

LITERATURE REVIEWS AND THE JORDANIAN TAX LAW

Literature reviews will include two significant parts of our study which are the technological side (electronic) and the tax side (methods of tax evasion), let's begin with the electronic part quality study(Judeh, 2016) mentioned that applying information and communications technology in the Jordanian tax system contributed in the aid of achieving tax goals, Uysal&kurt2018 study approached that the inventions brought by the blockchain technique in the fields of accounting and auditing with preparing the system of saving records on a technological approach of the blockchain helps achieving the main goals for the financial statements and auditing such as assuring the safety of information , preventing flaws and fraud , and the ability of measuring the performance and financial state regarding work in the actual time , Oleary(2017) study established that the Alternative configurations for different blockchain structures that can be out in use to collect and process transactions in a group of multiple settings including accounting , auditing and the supply chain

Dai & vasarhelyi(2017) study added that the blockchain technology will affect the profession of accounting and play a major role in it as it will require more expansion in the field of accounting implementations , Abrantes & ferraz(2016) study mentioned the use of technology to decrease the tax evasion throughout big data technique where it's possible to take advantage of it in facing problems of tax evasion in multiple methods and here is some of it : increasing the size of auditing operations , improving the methods of revealing tax evasion , improving the collecting of tax revenue , also improvements in the complex Fraudulent investigations

with the possibility of analyzing all available data(company/individuals) , Yalama & Gumus(2013) study revealed many factors regarding the behavior of tax evasion in Turkey and established the existence of a huge gap between the amount of the Legally deserved tax and the amount that's actually being paid by the taxpayers.

Nakamoto (2009) study prepared a system without the dependency on trust given by a third party by using a network of peer-to-peer to prevent the problem of double agreement (preventing the transaction from happening twice) whereas the network's timestamps works on partitioning of transactions by parting it into a continuous chain of working evidence based on partitioning and forming an unchangeable record where the financial copy from peer-to-peer sends the payments made directly through the internet from one party to another without having to pass through a financial establishment

Tax part (methods of tax evasion) : AL-Zoubi (2013) study mentioned multiple methods of tax evasion which were not mentioned frankly in the Jordanian tax law such as quantities and weights manipulation , the manufacturing formula to increase the cost and decrease the sales and changing the Specifications of the commodity , increasing the expenses that can decrease the tax such as raising the amount of use on machines and tools , for briefing the methods of tax evasion the Jordanian tax law was reviewed and it established a number of it , they were mentioned through the explaining on how to build the study's model , it has been mentioned in the first and second field of the study tool and not mentioned here to avoid repeating it.

THE STUDY METHODOLOGY AND ITS TOOLS

The Descriptive analytical method was used

- **Descriptive :** to understand The phenomenon of tax evasion and the methods used in Jordan as its own reality , and then the study model was prepared , and used the model building to examine the first hypothesis .

- **Analytical :** to collect the primary data using the study tool and they are :

  A. The Questionnaire: that includes the methods of income and sales tax evasion , its data was analyzed to examine the second hypothesis

  B. the interview : contains a group of questions that may help evaluate the models specifications and gaps and other important data to get the data that hasn't been mentioned in the Questionnaire and important for the study

Study Procedures

The descriptive analytical method was used which describes the phenomena and then collects the primary data analyze it and tests the hypothesis , multiple Concatenated procedures were followed in this study to build and evaluate the model , where the first procedure followed was the identification of the methods of tax evasion in each sales and income tax throughout the revision of the modified income tax law number (32) in the year of 2018 and number (29) in the year of (2009)for the sales modified tax law number (6) for the year of 1994 also reviewing the previous studies which handled the methods of tax evasion , many of the methods of tax

evasion will be mentioned and explain the ways of how to prevent it by explaining the building of the model to cover the largest amount of the evasion methods in the study , the second procedure was reviewing the blockchain specifications and working mechanism used to build the model , afterwards the third procedure was building the illustrated model to test the first main hypothesis ,the moved on to the fourth procedure which was preparing a questionnaire containing the methods of tax evasion (sales and income) , also prepared a personal interview that contains extra data such as the specifications and gaps of the model and the possibility of applying with the interactions with the system and regulation if found , finally the fifth procedure which is displaying the model to the study sample and explained to them in detail about its mechanism of action and asking them to fill the questionnaire to examine the second main hypothesis and the other concerned sub-hypothesis , then making a personal interview with the specialized to identify the specifications and gaps of the model and other important things concerning it

Population and Sample Study

The study population consists of auditors and department heads who are in the centers , branches , tax directories and the Directorate of combating tax evasion and the number of them is (700) auditors , their number was get through the personal interview with Mohammed Zayed (8-1-2020) . Where a random sample of them was chosen which has a number of (228) analyzable questionnaires, a personal interview was made with (44) specialized auditors in the estimation of tax.

Study Hypothesis

The study hypothesis is concentrated on two main hypothesis and other two sub-hypothesis as shown below:

1- It's not possible to build a model using the technique of the blockchain to reduce the tax evasion

2- The model prepared using the technique of the blockchain cannot reduce the tax evasion

From the second hypothesis the next two sub-hypothesis branches out:

a. The model prepared using the blockchain technique cannot reduce the evasion of the income tax

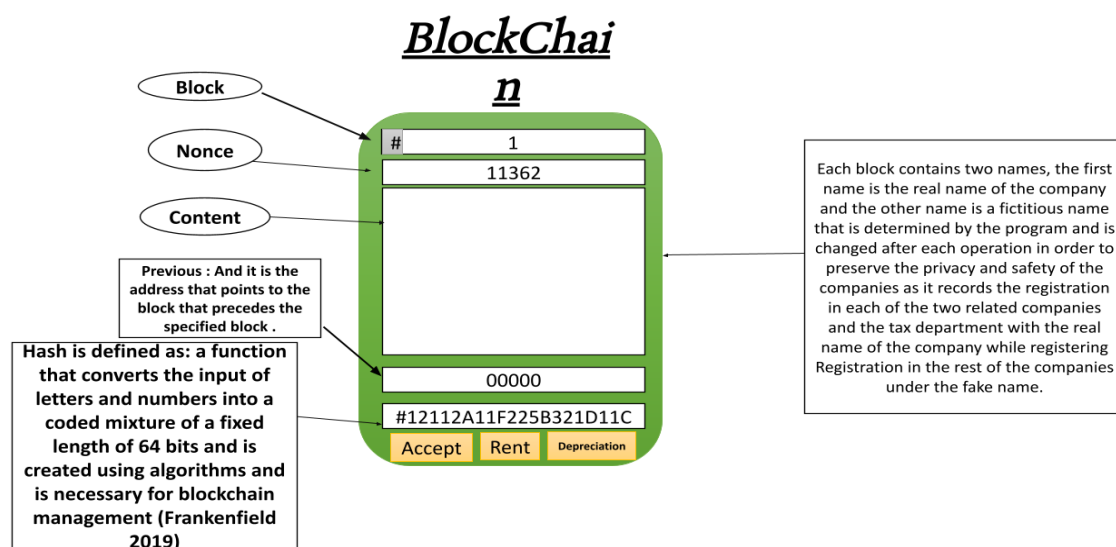b. The model prepared using the blockchain technique cannot reduce the evasion of the sales tax.

The first hypothesis will be tested relying on the model built using Blockchain Technology the second main hypothesis and its sub-hypothesis will also be tested after analyzing the primary data collected by the study tool.

Building a Model to Reduce Tax Evasion Using Blockchain Technology

In this part we will show how to build the study model using Blockchain Technology which starts with a simplified and practical definition of the blockchain to facilitate the understanding and the way of handling it, it is consisted of a number of blocks connected with each other, and block is considered as the main component and the first forming part of this chain, the block contains:

1- **The content** : the transactions that happens between the parties (selling and buying companies)

2- **The timestamp** : the actual time the transaction is happening in the chain

3- **Hash**: it is also called the chain (digital signature). However, it is a code, it was produced by algorithms inside the chain, through which chains are distinguished from each other; also it connects the blocks inside the chain with each other to make a chain of blocks.

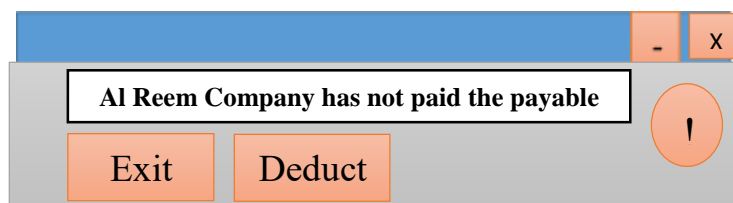**Figure 3: represents the parts of each Blockchain**

The Working Mechanism of Accept and Deduct

Accept key is used to accept the transaction in Blockchain after confirming the validity of mutual financial transactions between parties, This is achieved by accepting the transaction after verify that all its elements have been completed, and calculating the tax to be deducted automatically from the taxpayer's balance in the bank in case he did not pay within the period specified by the department for him.

The deduction is carried out with the assistance of the Jordanian legislature which has issued a decision that allows deduction from the taxpayer's account from the bank , as soon as ,the

taxpayer meets the legal period to pay the Tax Payable, where a notification appears at the Tax Department that the company (S) or the taxpayer, for example, has fulfilled the specified period to pay the tax, which will compel it to deduct the tax from the balance of The taxpayer in the bank, by clicking on the Deduct key that will appear in the notification box as in the following figure:

Figure 4: the notification box to the automatic payroll deduction mechanism

This in turn helps to reduce the above- mentioned Tax Evasion methods in Articles 66 (6) and 64 (E) of the Income Tax Law, and Article 30 (12) of the Sales Tax Law, which has talked about the delay or failure of the taxpayer to pay the tax payable.

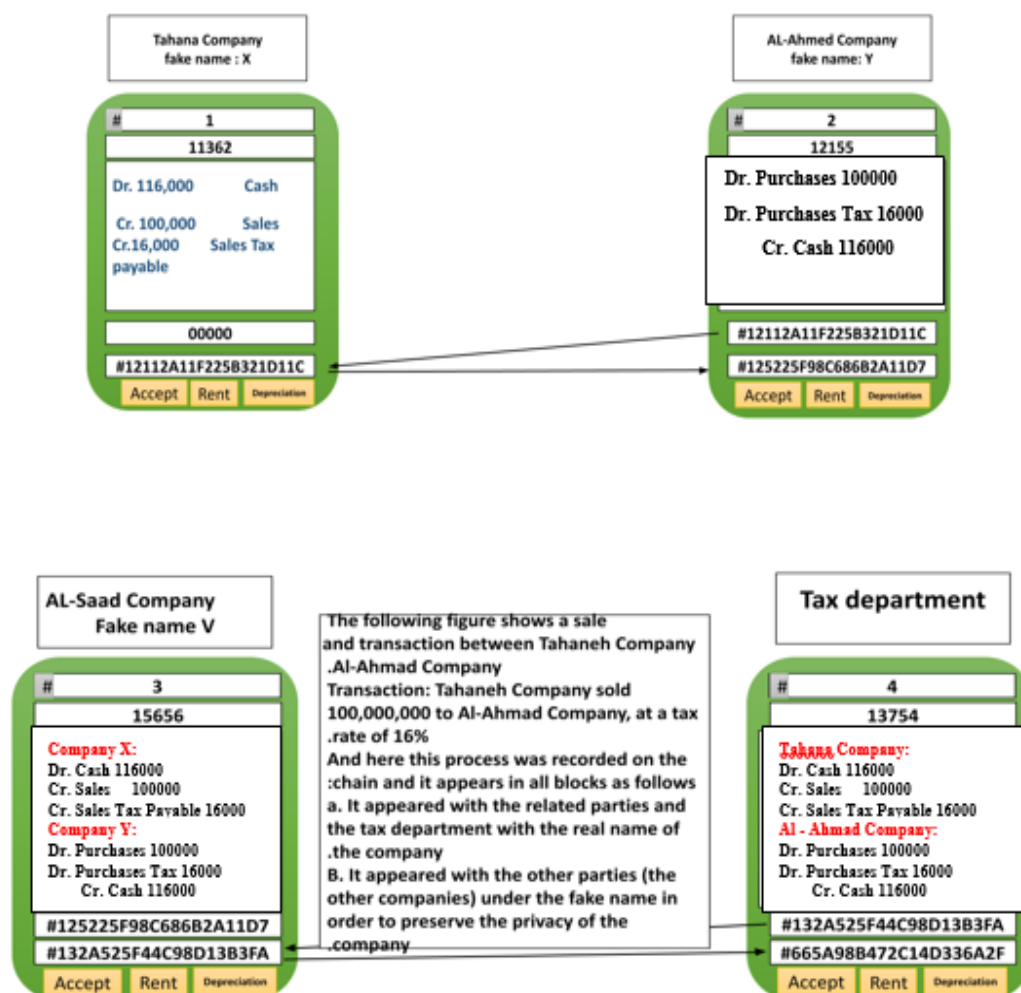**The Finance mutual transactions between the transaction parties (companies) and Tax Department.**

To show how to conduct transactions between companies and display them to Land Department, as the virtual example described below:

Note: We underline, however, that an adjustment was made to preserve the confidentiality and privacy of companies, which is to show the names of the companies that the process takes place between them under the fake names of the rest of the companies mentioned on the chain.

Example: Tahana company sold goods to AL-Ahmad Company , (100000) Cash JD , Knowing that the Sales Tax is 16%, as it appears in Figure (5), where the selling company enters the transaction in the content bar of its mass, Then an important procedure takes place, which is to ensure that the sold goods are taxable or exempt goods. If they are taxable goods, then they move to another stage, which is to ensure that the withholding tax rate is identical to what the Jordanian legislator has issued, or not, it may be 16% or 4% depending on the nature of The commodity, and this is done through a list that is defined for the goods and its tax rate at the Ministry of Industry and Trade, and then the sales tax is calculated automatically and the accounting record is created by clicking on Accept key, so the process is both approved. Thus, the transaction has been approved by both parties, afterwards this transaction appears to the Income and Sales Tax Department with real company's names, and then it appears to everyone in the chain with fake names.

This process helps reduce the tax evasion methods where it is mentioned in Article 30 (5, 6 and 11) of the Sales Tax Law, which talks about disposing of goods in a way that does not conform to what the Jordanian legislator issued and the use of rates that violate the law.

Figure 5: Mutual transactions between the parties to the transaction (companies) and the tax department

The prepared model indicates how to deal with the automatic deduct

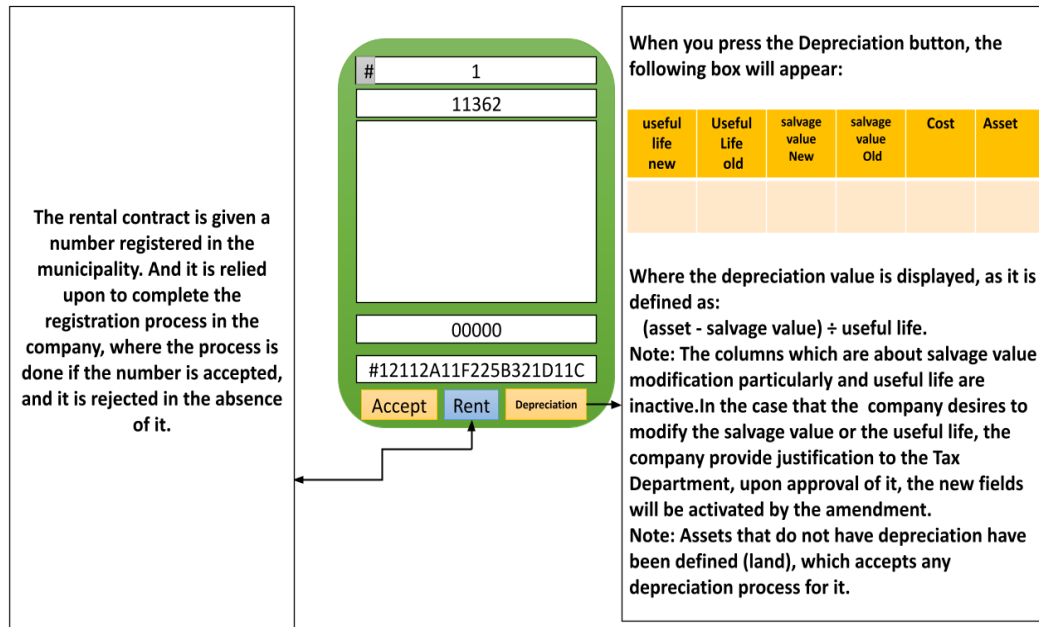**Figure 6: the automatic deduct to the Tax Payable**

The figure is prepared by the researcher

Depreciation and Rent keys which shown in figure (7)

- **Depreciation Key:** this key processes the manipulation which may happen in the asset value or its useful life or depreciation Non-depreciable assets which is reflected in reducing the Tax Payable Value, which was mentioned in Article 38 (c) of the Income Tax Law, which states that "the value of the asset should not exceed the total amount depreciated in return of Depreciation and Amortization" so that it is based on deterring these methods through the work mechanism that is shown in Figure (8).

- **Rent Key:** this key processes any manipulation may happen in rent contracts, however the rent value may be viewed in a higher value compared with the value in the contract to reduce the revenue amount, especially if the rent has been done by individuals which means that the lessor is not found in Blockchain .

This was set by obligating the companies to register the lease contract with the municipality and give it a serial number, and then the contract number is entered in a special field next to the rent entry expense, and the system will not accept this process until after the entered contract number is matched with the contract number defined with the municipality (The system implements this automatically). For an explanation of how it works, see Figure No. (9).
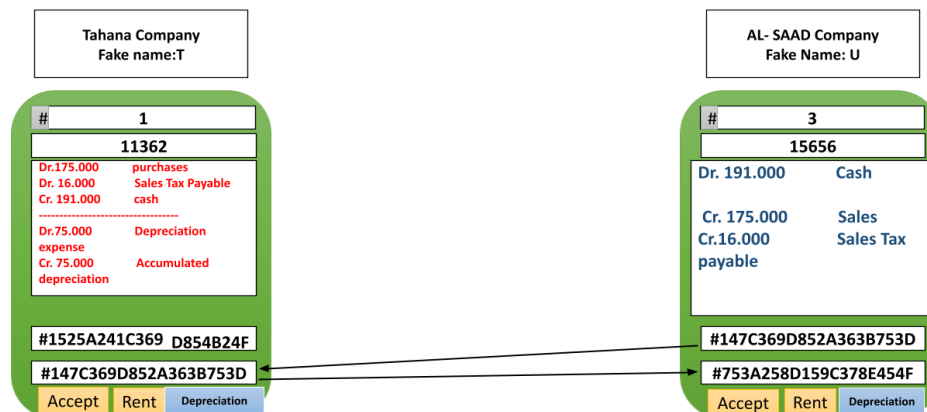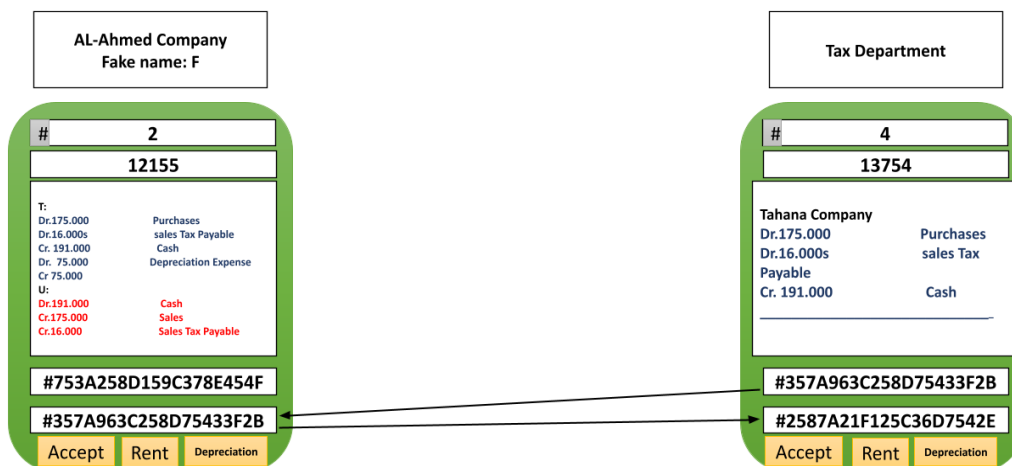
Figure 7: Rent and Depreciation keys

The figure is prepared by the researcher

The processing mechanism of the depreciation in the study model

Figure 8: The Mechanism of processing the Depreciation
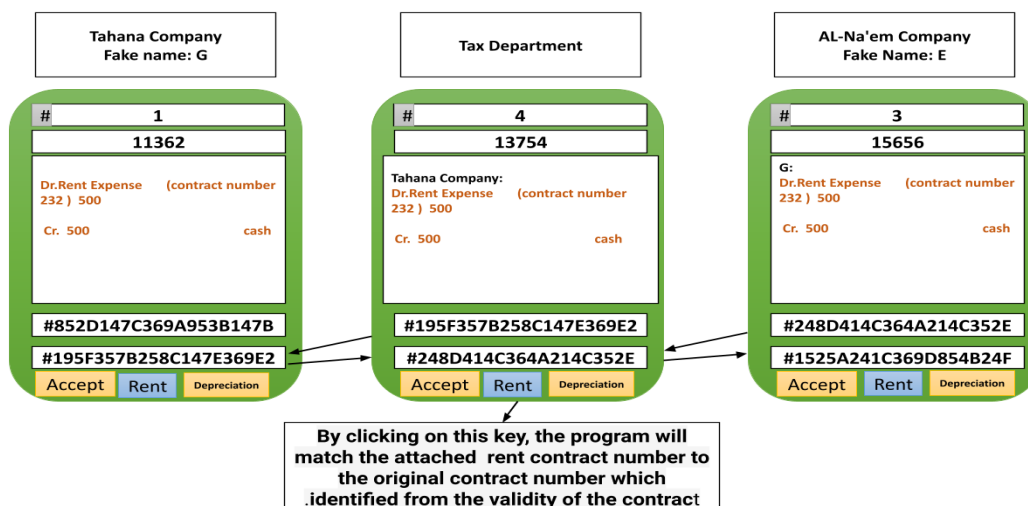
The figure is prepared by the researcher

According to the study model ,the example in figure (8) shows the Depreciation processing mechanism, let's assume that a purchase was made between Tahana and Al-Saad, Al-Saad bought a car from Tahana and the transaction was recorded on the blockchain in the same way as in the previous example, but if Al-Saad wanted to record the depreciation of the asset if It is verified on the blockchain by registering the asset data by Al-Saad company on the block chain by pressing the Depreciation key, in which a list appears that Al-Saad company fills in as follows: the asset name, salvage value and useful life, then the depreciation value is calculated Automatically through the equation defined on the chain, which reduces tax evasion rates by manipulating the value of the asset until depreciation as it shown above its value.

The assets that depreciation no lands were determined on the chain , in order to prevent what we already mentioned in Article 38(a) of the Income Tax Law which states that "the taxpayer shall not depreciation the value of the land and any other capital assets that do not lose their value over time."

in the event that the company desires to modify the salvage value and the useful life, a new mechanism has been developed which allows edit boxes such as the useful life and the salvage value inactive to the company, In order to activate it, the company applies to edit the value or age at the Income and Sales Tax Department attached to the justifications for the amendment, and accordingly the department activates these fields.

Mechanism of processing the rent expense

<p align="center">Figure 9: processing rent expenses</p>

The figure is prepared by the researcher**.**

The above figure shows the mechanism of processing the rent expense in the study model, to make it clear, the store's rent transaction was conducted to Tahana Company from individuals (they're not found in Blockchain). As well as. to set this transaction and to stop manipulation in the rent expense value, the Rent Key was used as it shown above in Figure (9), When entering the rent entry in the content box, it must be entered with the rent contract number, and the validity of this restriction is not approved, and it is not accepted on the chain until after pressing the rental key to match the entered contract number with the rental contract number listed in the municipality. Activate the Accept key to complete the process and appear on the chain.

To reduce Tax Evasion methods which are mentioned in Income and Sales Tax Law by using the prepared model

How to access real data? How can we overcome the problem of providing the tax department with fake data that contradicts reality? How can we get rid of the problems of tax evasion, which are caused by the tax return? How can tax evasion rates be reduced by addressing some of the methods that lead to this? Which were mentioned in detail in Article 66, 63, 64 (A, D, F, P, G) of the Income Tax Law, and Article 30 (3, 9, 10) of the Sales Tax Law.

Moreover, this will be described by the model prepared using Blockchain shown in Figure 10.

Figure below (10) illustrates a sale transaction between Al-Ahmad Company and Al-Zoubi Company. This transaction has been accepted on the chain after being subject to the verification terms that were previously pointed out.

If the transactions occur on Blockchain and confirm by the buying and selling company, all the data of these transactions will reach the Income and Sales Tax Department and therefore it will be reflected on the department's business as follows:

1. There is no need for companies to submit a tax return to the tax department, because the department will have all the taxpayers' data and can determine the amount of tax required of them, and if the tax department wants to keep the tax return submission processes, it will help verify the data contained therein.

2. There is no need to provide evidence of the transactions that take place such as documentations, invoices and records, because all the transactions that will occur will be recorded immediately on the chain and will be available to the tax department at any time.

It should be added that the above will reduce tax evasion caused by providing phantom data that goes against reality or the company's failure to recognize its ownership of official financial records.

Figure 10: Buying and Selling Processing (1)

The figure is prepared by the researcher.

When conducting buying and selling operations between other companies, the operations will appear similar to what was mentioned in the previous figure, and all transactions will be listed with the Tax Department, which provides it with real, correct and accurate data about all companies that makes it possible to calculate the tax payable.

To make things clearer, the following example shows how expenses and revenues are controlled and processed on Blockchain

Figure 11: Controlling and processing expenses and revenues on Blockchain

The previous figure shows the paying electricity transaction expenses by Tahana Company to the Electricity Company, where the process of paying electricity is recorded as an expense with Tahana Company and recorded as revenue with the Electricity Company, and the transaction appears with Al-Saad Company (a third company on the chain that has nothing to do with the transaction) under the fake name, while The transactions of the tax department appear in their real names so that the department can include the expenses and revenues for their owners when

calculating the tax on them, and this helps the income and sales tax department determine the real value of the expenses of the companies, which will help it prevent tax evasion resulting from the exaggeration of the value of the expenses contained in the income statement (income statement)

The Final Model

After completing building of the model using the Blockchain technology, in which a number of examples were used to demonstrate and clarify the practical application of it, the model appears in its final model as in Figure (12) below, and accordingly it becomes clear to us practically the possibility of building the study model using the Blockchain technology, and accordingly The first null hypothesis which states that "it is not possible to build a model using blockchain to reduce tax evasion" is rejected, and the alternative hypothesis that states "it is possible to build a model using blockchain technology to reduce tax evasion" is Accepted , and the model will be evaluated. Practically to test the second major hypothesis as shown below.

Figure (12) shows the database for the blockchain and how all data appears in each block, where all appear anonymously in all blocks except for the parties related to the transaction and the ncome and Sales Tax Department.

Figure (12) Final Model

DATA ANALYSIS AND HYPOTHESIS TESTING

In this part, the study date will be analyzed using two tools: the first one is the Questioner: to evaluate the ability of the prepared model using Blockchain to reduce Tax Evasion, where the second is a personal interview: which provides important data that were not available in the questionnaire, as this part was divided into:

Questionnaire Data Analysis

Sample characteristics

This part views Frequencies and the percentage that represented in the job title, experience, specialization, courses, educational qualification, and workplace as shown in the following table:

Table 1: Frequencies and percentages of the characteristics of the study sample

Statement	Frequency	percentage	Cumulative percentage
Job title			
tax auditor	212	93.0	93.0
department head	16	7.0	100.0
Total	**228**	**100.00%**	
Experience			
Less than 3 years old	51	22.4	22.4
From 3 years to less than 6 years	60	26.3	48.7
From 6 years to less than 9 years	44	19.3	68.0
From 9 years and more	73	32.0	100.0
Total	**228**	**100.00%**	
Educational qualification			
Intermediate Diploma	2	0.9	0.9
Bachelor	166	72.8	73.7
M.A.	54	23.7	97.4
PhD	6	2.6	100.0
Total	**228**	**100.0**	
Specialization			
Accounting	202	88.6	88.6

Financial and banking sciences	19	8.3	96.9
business management	7	3.1	100.0
Total	**228**	**100.0**	
Do you get one of the following courses			
Methods of tax evasion	37	16.2	16.2
Combating tax evasion	33	14.5	30.7
tax expert	22	9.6	40.4
JCPA	25	11.0	51.3
More than one course	71	31.1	82.5
There are no courses	40	17.1	100.0
Total	**228**	**100.0**	
Place of work			
One of the Tax Department or Center	216	94.7	94.7
Directorate of combating tax evasion	12	5.3	100.0
Total	**228**	**100.0**	

The previous table shows that all the included individuals are the target audience to conduct the study, embodied as the tax auditors, however, they distributed according to the experience into four groups between less than 3 years of experience to more than 9 years.

As for the academic qualification, the majority of the sample came from those who obtained a bachelor's degree, which may represent the acceptable academic degree to occupy the position of tax auditor and head of the department. With regard to specialization, the majority of the sample came from those with an accounting specialization who have the specialization required to deal and understand the statements of the questionnaire. As for as courses, the majority of the study sample came from those who obtained the accounting specialization and they are the owners of the specialization required to deal and understand the statements of the questionnaire, and with regard to the courses, the largest percentage was in favor of those who obtained more than one course, making it easier for them to understand the prepared form and answer the questions of the questionnaire. Moreover, this presentation shows that the sample is various according to its features. As well as, this variety empowers a good representation to the study population, thereby strengthening the trust of the concerned parties, researchers and readers of this study in its data and results.

Reliability (Cronbachs Alpha)

This test measures the internal consistency between the study questions as it shown in the following table:

Table 2: Cronbach's alpha test for the two fields of study

Major	Percentage
M1	87%
M2	86%

From the table above we notice that Cronbach Alpha is for the first field (87%) and the second field (86%), which is greater than the approved percentage for human studies (70%) (Sekaran & Bougie, 2016) and it means that there is a high degree of internal consistency between its paragraphs, which achieves the characteristics of questionnaire stability.

Normality Test

Table 3: Normality Test

Test-T	Major
.0860	M1
.1270	M2

Test distribution is normal

We observe from the previous table N.(3) that the T test is greater than 5% in two fields which means that the distribution of the sample is normal .(Sekaran&Bougie ,2016).

The ability of the model prepared using the blockchain to reduce the tax evasion.

To test the ability of the model to reduce tax evasion, it was displaying to the study sample and explained to them in detail about its mechanism of action, and then they were asked to answer the questionnaire and the interview.

This part in divided into two sectors depending on the type of the tax:

Sector one: The ability of the model prepared using the blockchain to reduce the income tax evasion methods.

Sector two: The ability of the model prepared using the blockchain to reduce the sales tax evasion methods.

Sector one: the ability of the model prepared using the blockchain to reduce the income tax evasion methods

Table 4: means, standard deviations and the level of significance for the first sector paragraphs

Question number	order	The questions	mean	standard deviation	Level of significance
1	8	Reducing the presentation of the tax return by the charged relaying to records or established documents or including data the intersects with what's proven in records or documents he hid knowingly	4.34	502.	High
2	12	The reduction of the tax return by the charged based on the fact that there are no records or documents including data that intersects what's been established in what he has of records or documents he hided	4.23	434.	High
3	6	The reduction of the ruining the records or concerned documents deliberately before the end of the given period to keeping it according to the law regulations	4.36	500.	High
4	7	The reduction of the creating or changing the buying-selling bills to deceit the department into minimizing the profit and increase the losses	4.35	522.	High
5	2	The reduction of the concealment of an activity subjected to tax	4.46	499.	High
6	9	Abiding to importing tax within thirty days of paying it	4.32	583.	High
7	2	The reduction of not exporting an asset invoice	4.46	533.	High
8	10	The reduction of delaying from offering the tax return within the appointed date	4.31	581.	High
9	4	The reduction of falling behind in holding record and documents according to the law regulations by the assigned	4.40	597.	High
10	3	Reducing the falling behind on registering for the department according to the law regulations by the assigned	4.45	525.	High
11	1	The reduction of not providing the department with a statement of the names of agents and addresses according to the regulations of the article (25) of the law by the public accountant	4.52	551.	High
12	5	The reduction of not informing the department of any changes made on the incoming data in the registration request in the appointed data	4.39	602.	High
13	9	The reduction of falling behind on the tax deduction and its supplement to the department according to the law regulations	4.32	505.	High

14	11	The reduction of not providing the records and documents that must be kept according to the regulation of law	4.27	558.	High
15	8	The reduction of not exporting an invoice or a document when requested by the user	4.34	511.	High
16	9	The reduction of the deficiency in the tax return or increasing the contraction of the amount or deducting the tax paid to the account according to the given tax return by the assigned	4.32	568.	High
17	9	The reduction of the Authentication given by the public accountant on a non-matching or interacting financial documents with the regulations of law or the international accounting standards, laws and ongoing systems	4.32	538.	High
18	5	To reduce the land depreciation or any capitalist assets that doesn't lose its value during the time	4.39	586.	High
19	8	To reduce the inaccurate reassessment for the value of the asset and the depreciation that leads to an increase on the expenses	4.34	536.	High
Mean			4.36		

Before starting to make the specific result clear, which is about the ability of the prepared model that uses Blockchain which reduces Tax Evasion of the Income Tax, so it's necessary to know the approved mechanism to answer the study sample and Significance level. The quinquennial Likert level was used to distribute the answers of the study sample, as shown in the following table (Sekaran&Bougie, 2016).

Table 5: Distribution of the study sample answers values according to Likert Level

General Mean	strongly disagree	Disagree	Neither Agree Nor Disagree	Agree	strongly agree	Result
3	1	2	3	4	5	Value

The general mean (3) considered as the cut-off between the sample members approvement on the paragraph that the prepared model using Blockchain is able to reduce the tax evasion method or disapproval of it, and the significance level of the questionnaire paragraphs was determined according to the following equation:

{(highest answer - lowest answer) / number of levels {to become} (5–1) / 3 = {1.33. The Significance levels are distributed according to the following table:

Table 6: the Significance level and its Range.

high	medium	Low	significance level
from 3.68 to 5.00	From 2.34 to 3.67	from 1 to 2.33	Range

Table No. (6) Demonstrates the study sample answers to the paragraphs, which relates to the ability of the prepared model that uses Blockchain to reduce income tax evasion methods. The general mean for this field appeared with a value of (4.36), which is higher than the mean of the study tool (3). This means that the tendency to the sample of the study is the approval of all the paragraphs, and the answers of the sample members are very close and there is no dispersion in them as shown in the value of the standard deviation of the paragraphs, which was low.

First: The model's ability to reduce tax evasion methods, which relate to records, registration, and accuracy of tax returns.

Based upon the questionnaire terms analysis, which was prepared in accordance with the amended Income Tax Law No. (32) of 2018 and literature reviews ,so it appeared in terms (1-2-3-4-7-8-9-10-12-14-15-16) Which addressed not registering with the department, submitting fake records or documents, deliberately destroying records, submitting tax returns containing incorrect data, and refraining from submitting a tax return to evade paying taxes, it was found that the prepared model using Blockchain is able to reduce these methods because the answers' mean of the study sample was greater than the mean of the study tool (3), and the model reduces these methods by excluding the model for the idea of providing records ,documents and invoices, as well as, excludes registration with the department and submitting tax returns, because all transactions occur on the network Electronically, the department is provided with all information.

As soon as the transactions happen within the model and approved by all associated parties all data will arrive to the tax department and everyone in the network, which means that all paper transactions like documents, invoices and records will no longer be needed because the recording of the transactions that happens between the parties is recorded on the chain simultaneously with its actual happening and appears directly to the tax department and everyone on the network

The model also contributes in reducing the methods of tax evasion resulted by not registering to the department by the fact that the model doesn't ask the assigned to register to the tax department and doesn't demand them to submit the tax return because all of the assigned data will be available at the department

Second: the ability of the model to reduce the methods of not supplying the assigned payable tax to the tax department

Relaying on the analysis of the questionnaires items which were prepared according the income tax law and the previous studies it was shown in the (6,13) items that handled the supplement of the payable tax , that the model prepared using the blockchain is capable of reducing these

methods because the mean came higher than the mean of the study tool (3), where the model was prepared to be able to deduct the tax automatically from the assigned as soon as the legal period determined by the department is fulfilled whereas the tax department determines the period for deducting the tax on the chain, when the transaction between the parties is approved a timer will be activated to calculate the period which in the payable tax must be paid , if the taxes were not paid a notification will appear at the department giving it the right to automatically deduct the tax from the assignee's bank account with the help of the Jordanian legislator issuing a law that allows deducting from the bank.

Third: the model's ability of reducing the methods of the public accountant evasion (as auditing company)

Relaying on the analysis of the questionnaires items which were prepared according the income tax law and the previous studies it was shown in the (7,11) items which handled the methods of the public accountant evasion , it was shown that the model prepared using the blockchain can reduce these method because its mean came higher than the mean of the study tool (3),where the model reduces these methods by providing all the data that the public accountant provides , based on that we can dispense his data.

Fourth: the model's ability to reduce the tax evasion that resulted from Depreciation of Non-depreciable assets and the mistaken reevaluation of the assets value.

Relaying on the analysis of the questionnaires items which were prepared according the income tax law and the previous studies it was shown in the (18,19) items which handled the evasion throughout giving an unreal value for the asset or Depreciation non depreciable assets, the model prepared using the blockchain reduces these methods because its mean came higher than the mean of the study tool (3), according to the opinion of the study sample, the model reduces these methods by creating a specified key for the Depreciation, when the asset is bought and the buying operations is verified on the chain, the Depreciation key is pushed and the assets specified cell will be filled therefor the Depreciation value will be automatically calculated without the interference of others using the identified equation on the chain

And whether the company wants to change the useful life or the salvage value, a new mechanism was developed, which is by making the new salvage value and new useful life boxes inactive for the company, and they are not activated until the company presents to the tax department the required justifications for the change, and then the tax department activates the boxes for the company.

With regard to the depreciation of non-depreciable assets, they are defined on the chain so that any process of depreciating them will be rejected

Fifth: The ability of the model to limit the concealment of a taxable activity or part of it.

The form is able to limit item no. (5), which is to limit the concealment of the activity or part of it, that the company on the chain does not accept dealing with any company that is not on the chain because when recording the process, the form asks the seller or buying company to enter The data of the company you are dealing with.

Sector Two: The ability of the model prepared using Blockchain to reduce sales tax evasion methods.

Table 7: Means, standard deviation and Significance level to the second field paragraphs

Q.NO	Order	Questions	standard deviation	Mean	Significance level
1	3	Reducing the defaulting on submitting a registration application for the department, for a period exceeding sixty days from the date of expiry of the period specified for registration.	.506	4.43	high
2	2	Reducing the cancellation of the registration of the taxpayer at his request if it is proven that he is still obligated to register according to the provisions of the law.	.518	4.48	high
3	8	Reducing of sales confirmations or taxable goods or services if a decrease in the value of real taxable sales exceeds (10%) or five thousand dinars, whichever is less?	.473	4.31	high
4	1	To reduce any person's fulfillment of unpaid tax revenues.	.518	4.49	high
5	9	Limit the application of tax rates or categories to taxable goods or services in violation of the provisions of this law	.550	4.27	high
6	5	Reduce the tax deduction or refund it in violation of the provisions of this law.	.579	4.39	high
7	5	Reducing tax deduction or refund for goods that have been used or used in the production of other goods for personal purposes	.524	4.39	high
8	6	To reduce the submission or issuance of documents or the documents required by the provisions of the law, or postponing their submission or issuance with the intent of evading	.625	4.36	high
9	7	Reducing the submission of forged or artificial documents or the issuance of any of them with the intention of reducing, deducting or refunding the tax in contravention of the provisions of the law.	.571	4.32	high
10	4	Reducing the possession of taxable goods with the intention of trading them, knowing that they are tax evaded.	.518	4.40	high
11	4	Reducing the failure to pay the tax due on the imported service allowance for a period exceeding three months from the date specified for its payment in accordance with the provisions of the law.	.518	4.40	high
		General mean		**4.38**	

Table number (7) illustrates the answers of the study sample on the paragraphs associated with the model prepared using the blockchain ability to reduce the methods of sales tax evasion where the mean came out to be with a value of (4.38) its higher than the mean of the study tool (3) which means that the general direction of the study sample is the approval on all paragraphs, all of the sample individuals answers were so close as there is no dispersion as shown in the value of the standard deviation of the paragraphs that came low, and to clarify in a detailed manner the sectors answers will be divided based on how rapprochement they are with each other as below:

First: the ability of the model to reduce the tax evasion methods regarding the department registration and the accuracy of the tax returns

Relaying on the analysis of the questionnaires items which were prepared according the sales tax law and the previous studies it was shown in the (1,2,3) items which handled the act of not registering for the sales department and the cancellation of the file while it's still obligated to register and providing returns that contains incomplete information, its shown that the model prepared using the blockchain was able to reduce these methods because its mean came higher than the mean of the study tool(3), this happens by the fact that the model excludes the registration for the department and also excludes the procedure of providing returns because all operations happen electronically there for the data of the assigned which the department needs is available on the chain

The limit of registration is handled by making all the operations of selling and buying electronically, which means that all operations are available at the department, as soon as the assignment reaches the registration the taxes which he must pay are calculated automatically.

Second: the ability of the model to reduce the methods of tax evasion regarding the rates application or the tax Categories on goods or services that submits to tax in a way that goes against the regulations of this law

Relaying on the analysis of the questionnaires items which were prepared according the sales tax law and the previous studies it was shown in the (5) items which handled the application of rates or categories of tax on goods or services that submits to tax that the item is against the regulations of this law , the model prepared using the blockchain can reduce these methods because the mean of the study sample answers came higher than the mean of the study tool (3) , where the model reduces this method by creating a key called (accept) in which is known if the commodity submits to tax or tax free with estimating the tax rate which the commodity submits to this happens by listing the goods and its specifications also showing its tax rates from the commerce and industry ministry , this key also accepts the operations after verifying it.

Third: the model's ability to reduce the methods of tax evasion regarding the providing of a reality contrary document

The model reduces the methods mentioned in the items number (8,9) which handled presenting fake documents or the delay in presenting it, when the transactions happen inside the model and approved by all related parties all data will arrive to the tax department and everyone in the network which means that the paper transactions like documents , invoices , and records will no longer be needed because the transactions that happen on the chain will simultaneously be recorded in the actual time of happening and appears directly to the tax department and all parties on the network.

Fourth: the model's ability to reduce falling behind on tax payments.

The model reduces the method number (12) which represents falling behind on paying the payable tax by creating a new mechanism to get the taxes from the assigned, where the model was prepared to be able to deduct the tax automatically from the assigned as soon as the legal period given by the department is fulfilled, the mechanism of deducting was illustrated earlier in the second item of the analysis of the first sector.

Fifth: the models ability to reduce discounting tax at returning it in an illegal way and the reduction of the position of tax contraband goods.

The model reduces the items (4,6,10,11) which handled the fulfilment of undeserved tax returns ,discounting tax and taking back in an illegal way, discounting tax for personal goods and the possession of goods that subjects to tax knowing they are tax contraband , it is reduced by determining the value that must be returned for individuals who deserve it and the fact that no selling or buying transaction can be entered without being excluded from tax , this goes back to the fact that all goods are identified by the commerce and industry ministry for being subjected to tax or not, and the rate of tax on each commodity.

Testing Hypotheses

In this part the second main hypothesis will be tested which states "the model prepared using the blockchain cannot reduce the tax evasion "

.The two sub-hypotheses:

1- The model prepared using the blockchain cannot reduce the income tax evasion

2- The model prepared using the blockchain cannot reduce the sales tax evasion

Table 8: Hypothesis Testing

Hypothesis	Calculated T	Scheduled T	Sig	result	mean
sub-hypotheses one	68.960	1.990	0.000	**Rejection**	4.360
sub-hypotheses two	60.250	1.990	0.000	**Rejection**	4.380
The second main	**Rejection**				

From the table above we notice that the value of (T) calculated is higher that the value of the scheduled (T) that estimates (1.990) and the sig is less than the significance with (5%) according to the decision which the Null-hypothesis is rejected and the alternative hypothesis is accepted when (T) calculated is higher than the (T) scheduled and the sig is less than (5%) , based in that the two null sub-hypotheses will be rejected and the two alternative sub-hypotheses will be accepted in which they state:

1. The model prepared using the blockchain reduces the income tax evasion

2. The model prepared using the blockchain reduces the sales tax evasion.

As the two sub-hypotheses comes from the second main hypothesis, and the two null sub-hypotheses were rejected the second main Null-hypothesis is rejected and the alternative hypothesis will be accepted in which it states:

"The model prepared using the blockchain reduces the tax evasion "

The Interview

The two researchers made multiple interviews with a number of specialized people in the field of estimating tax (tax estimators) and the field of detecting tax evasion such as department heads of the sections of estimating tax and they are (44) individuals , the interview was consisted   of five questions which aimed to get the data that wasn't mentioned in the questionnaire , it its considered as additional data regarding the specifications and the possibility of applying the suggested model or its interaction with the applied systems and regulations of the income and sales tax department , also any other systems or regulations within the borders of the Hashemite kingdom of Jordan if existed , the questions and answers are illustrated in the table below:

Table 9: The interview questions and results

The Questions	Frequency		percentage	
	Yes	No	Yes	No
Can the application of the model interact with laws and regulations?	3	41	6.8%	93.2%
Can the model be applied by the tax department taking in consideration the human capabilities, finances, technological and others?	29	15	65.9%	34.1%
Are there any gaps in the model?	13	31	29.5%	70.5%
Does the model have any specifications?	44	0	100%	0
Are there any suggestions to develop the model?	0	44	0	100%

from the table above the models application possibility is illustrated for not interacting with the ongoing laws and regulations it also came with a percentage of 93.2% for the interacting

negation , as for those who mentioned the application interaction which came in a very low percentage with a 6.8% they didn't reveal the laws and regulations that interacts with the application there for the models application possibility was adopted without neglecting the percentage of those who said there is an interaction, there for it was listed among the recommendations.

Also a percentage of 65.9% indicates that the model can be applied by the department for the availability of human resources , financial and technological as for those who pointed the lack of capabilities and their percentage was 34.1% they said during the interview that what they actually meant with this percentage was that the capabilities are available but has a weakness that can be overcome by training the human resources and the availability of grants for financial and technological support.

As for the gaps in the model a percentage of 70.5% indicated that the model is complete and has no gaps , a percentage of 29.5% came against that claiming the model has gaps and during the interview they said it is not a gap accurately but the model can interact with some of the procedures of the sales and income tax department but they didn't reveal these procedures , the two researchers see that the model's interactions with the department procedures are not gaps because the procedures can be modified to avoid the interaction in case it existed .

In the fourth question that handled the model's advantages all individuals from the chosen sample for the interview praised the model as it achieved multiple advantages and they are:

1. Improving the ongoing systems
2. Providing a large database that contains all of the company's operations
3. Minimizing the cost, time and effort to get information
4. Providing and delivering the actual information of the taxes for all of the company's operations without any deletion or changing it its content which reduces the tax evasion
5. Increasing the efficiency of harvesting taxes and maintaining the country's revenue

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Based on the previous proposal for building the model and analyzing the data collected using the two study tools: questionnaire and personal interview the study reached multiple conclusions and most important of them are:

1. The possibility of building a model using the blockchain technique to reduce the tax evasion was illustrated in the theoretical building of the model

2. The model prepared using the blockchain technique leads to the reduction of the methods of the income tax evasion represented in (19) methods , it also reduces the methods of the sales tax evasion represented in (11) methods , as illustrated earlier in the analysis , the model's ability to reduce the tax evasion using the blockchain working mechanism

considered as an open decentralized distributed general ledger , as it allows dealing anything valuable safely transparently and without any danger of manipulation of breaking through with applying some modifications like creating some keys such as Accept , depreciation and rent as illustrated earlier during the building of the model.

3. The model has many significant advantages, the most important of them is the product's ability to provide and deliver the actual information to the tax department regarding the company's operations without any deletions or modifications from its content which contributes in reducing the tax evasion with an increase in the efficiency of tax harvesting and maintaining the country's revenue.

4. The ability of applying the study's model in the Hashemite kingdom of Jordan as it does not interact with the applicable laws and regulations.

5. The government has the human, financial and technological capabilities to prepare and apply the study's model.

Recommendations

Based on the conclusions the study reached the two researchers recommend the following:

1. Laying the model to the sales and income tax department to study the possibility of adopting and applying the model to help solving an on-going problem which is the tax evasion whether it was on the level of the income or sales taxes.

2. Determining the procedures that interact with the application of the study's model and trying to modify it or modify the model in a way that guarantees the safety of the application without any mistakes or flaws.

3. Executing a study to determine how helpful and successful the model is in reducing the tax evasion of the individuals, private clinics and such.

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