IMPACT OF DIGITAL TECHNOLOGIES ON BANKING ACCOUNTING SYSTEMS IN JORDANIAN BANKS

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ABSTRACT

This study has aimed at identifying the impact of the digital technologies like the internet of things, big data, block chain, and robotics on banking accounting systems. The study has also illustrated the role played by digital technologies in improving financial data quality since accounting processing and data storage, in which robotics and block chain technologies are used, are accurate; and access to data is easy. The researcher has used descriptive analysis in order to examine the previous studies on digital technologies as well as their impact on accounting and the challenges of using these techniques in banking accounting systems. The study has concluded that there is a high impact relationship between the use of technologies (internet of things, big data, block chain, and robot) in the banking transactions and accounting systems used by the Jordanian banks.

In addition, the study has found that Jordanian banks which have trended towards the use of digital technologies in the accounting system, face various challenges including legislation, technical infrastructure, a lack of human resources, practically and academically qualified in the digital technologies, and a lack of knowledge of digital technologies among the clients

Keywords: Robotics, Block Chain, Big Data, Internet of Things, Banking Accounting Systems.

INTRODUCTION

The fourth industrial revolution is modern and important concept in the present time; It refers to a set of integrated technologies in which- forms of process automation, artificial intelligence and decision support system have new horizons; they aforementioned provide a new form of human interaction with the technology. In fact the use of these technologies in accounting, therefore, results in-a significant change of concepts of planning, analysis and design of accounting systems; In addition, new elements such as robots and block chain are added to the accounting systems; then, they will be added to accounting information system cycle. Furthermore, accountant's job is one of the jobs will be fully automated.

Using digital technologies in accounting has contributed to the focus on the data and its content and the connection between financial and nonfinancial information that must be provided at the appropriate time with a high accuracy. Accordingly, it becomes possible to extract the information through internet with a touch of button. In this study, a set of the most popular digital technologies which has highly affected the general accounting system and the accounting system used or expected to be used in the banks have been selected. Moreover, the banking sector is highly using these technologies due to the nature of digital services, to the large number of customers as well as the diversity of transactions and operations globalization. However, virtual digital currencies have been excluded because the Jordanian Central Bank has prohibited their circulation in Jordan at the date of preparing the research (Obeidat, 2014; Fernandez & Aman, 2018; Hambiralovic & Karlsson, 2018).

Several researchers support the use of the various Digital Technologies in Accounting including Ionescu et al. (2014), O'Neill (2016) and Rkein et al. (2020). In fact, Internet of Things (IoT) used in the accounting information systems brings the accounting closer to the technology; it also contributes to process more accurately the assets. Big data used in the accounting has a

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highly significant impact due to obtaining new types of data; such technology can process variable and conflicted data as well as structured and unstructured data. Consequently, it increases the effectiveness of analysis of the data in addition to transparency and integration of financial report and the level of disclosure, thereby affecting positively the characteristics of the accounting information. Moreover, according to The Institute of Chartered Accountants in England and Wales-ICAEW, block-chain is the largest digital ledger based on decentralization idea; it allows transferring the origin of ownership from one party to another in a real time with a high level of security and encryption; but it does not allow copying the origin of the ownership. In addition, it the ledger can be shared by the individuals all over the world, this ledger and can be constantly updated. Using block chain in accounting contributes to the variety of methods of preparing, processing and registering the financial events; it also contributes to the automatization of most of accounting jobs through different methods of accounting registration in which they are directly performed through a common ledger; and they cannot be performed by the users of electronic accounting applications. Consequently, reliability of accounting information will increase. On the other hand, Robotics technology is included in the institutes utilized in order to perform accounting jobs that are particularly repetitive manual paper tasks and verify automatically the financial data.; In addition, using robot in performing accounting tasks contributes to the increase of the quality of accounting work as well as the reliability of accounting data due to the accuracy, time and effort saving of performing accounting tasks which include the processes of collecting, registering, posting and preparing the financial reports and statements (Rkein et al., 2019; Moffitt et al., 2018).

Importance of Study

The study is important because it identifies to which extent digital technologies keep pace with the accounting systems; and it determines the role of these technologies in increasing the effectiveness and efficiency of banking accounting systems. In addition, this study identifies the impact of these technologies on the banking accounting systems. As far as the researcher knows, this is the first applied study on the topics of the digital technologies; and it illustrates the challenges which that the banks may face if they use the digital technologies.

Problem of Study

The fourth industrial revolution has introduced multiple technologies such as internet of things, big data, block chain and robotics.; These technologies have affected the accounting processes and introduced key changes in concepts and principles of accounting information systems.; Furthermore, they have improved the quality of financial reports and reduced the personal judgements; in addition, they have contributed to the preparation of accounting estimates. Thus, this study seeks to answer the following research question: What is the impact of the digital technologies of the fourth industrial revolution on the banking accounting information systems in Jordanian banks?

Purposes of Study

This study aims at achieving the following purposes:

- Identifying the digital technologies including internet of things, big data, block chain and robotics;
- Identifying the impact of these digital technologies on the banking accounting systems in Jordanian banks; and
- Identifying the most important challenges which that Jordanian banks face when using the digital technologies in the banking accounting systems.

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Limitations of Study

This study is limited to a set of the most commonly used digital technologies of the fourth industrial revolution-internet of things, big data, block chain and robotics and their impact on the banking accounting systems in Jordan.

Hypotheses of Study

For achieving the purposes of study, main hypothesis: the impact of the digital technologies on the accounting systems in Jordanian banks is tested.

Following Sub-hypotheses are derived from the main hypothesis:

- There is an impact relationship between the use of internet of things technology in banking transactions and the accounting systems in Jordanian banks;
- There is an impact relationship between the use of big data technology in banking transactions and the accounting systems in Jordanian banks
- There is an impact relationship between the use of blockchain technology in banking transactions and the accounting systems in Jordanian banks;
- There is an impact relationship between the use of robotics technology in banking transactions and the accounting systems in Jordanian banks;
- There are challenges of using the digital technologies in the accounting system in the Jordanian banks (Figure 1).

Model of Study

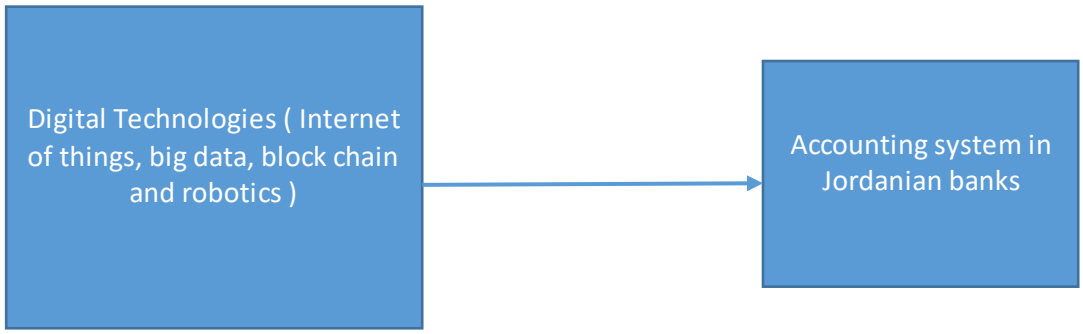

FIGURE 1
MODEL OF THE STUDY

LITERATURE REVIEW

Al-Jakhlab's study (2021) has aimed at identifying the level of knowledge of accountants regarding the technology of new blockchain as well as its characteristics and uses. In addition, it has measured the expectations and implications of applying this technology in accounting. The study also found that the accountants possess a high level of knowledge of technology of blockchain as well as its characteristics and uses. Furthermore, the researcher has indicated that there are statistically significant differences of the level of knowledge of accountants in accordance with gender and experience in years. Moreover, the study has found that the expectations of the accountants regarding the implications of applying the block chain technology are positive; and there are statistically significant differences of the expectations of the accountants in accordance with gender and experience in years. Naser & Al-Naser (2021) aimed at examining the impact of digital transformation on the reduction of information asymmetry in a sample of 50 companies listed on the Saudi Stock Exchange. Multiple correlation and multiple

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regression analyses were used in order to examine the impact of adoption of digital transformation technologies on the degree of information asymmetry in the Saudi Stock Exchange. The results of multiple correlation analysis have indicated that there is a significant negative correlation between the application of digital transformation technologies and the degree of information asymmetry in the sample of companies. The study has found that an increase of the levels of digital transformation has resulted in a decrease of the degrees of information asymmetry. In addition, the results of multiple regression analysis have indicated that there is a negative relationship between the level of digital transformation and price range according to a measure of information asymmetry; accordingly, the increase of the level of the digital transformation reduces the level of information asymmetry. Al-Bassiouni (2021) aimed at identifying the impact of using one of the digital technologies-clouds computing-on cost structure. The study has illustrated digital transformation models in business organizations and the resulted costs. In addition, it has indicated that the costs resulting from the decision of switching to computing system in business organization are divided into two main types: costs of transition towards the technology of cloud computing and post costs (Al-Bassiouni & Ashour, 2021). Al-Saghir's study (2020) developed a methodology of testing the impact of applying one of digital transformation mechanisms block-chain for tracking supply chain- on the activation of tools of intra block chain cost management. The study also focused on the role of this technology in supporting the method of analysis of value chain vs. supply chain as well as the methods of the target cost and open-book accounting considered the most important tools of intra-cost management of supply chain. Then, the study illustrated the impact of this technology on supporting the competitive advantages of supply chain. Moreover, the study concluded that there is a positive statistical correlation relationship between the application of blockchain technology in tracking a manufacturing supply chain, coordinating the efforts and relationships and supporting the analysis of value chain among chain parties. Furthermore, there is a statistically significant correlation between the application of block-chains technology in tracking a manufacturing supply chain, activating the methods of target cost and open book accounting as tools of intra cost management along the chain. Khamis's study (2021) illustrated the impact of applying Internet of things Technology (IoT) in the light of the adoption of Cloud Computing (CC) on inventory management system. The researcher analysed and assessed the previous studies related to the topic of study and a case study was used to collect the data on a performance of inventory management. The study concluded that applying internet of things technology in the light of adoption of cloud computing has fundamentally improved inventory management system. Amirhom (2020) aimed at identifying the impact of analysing big data on financial and operational performance of business organization. This study found that business organizations achieved various advantages when analysing big data. Business activities were increasingly understood, and financial and operational performance of these organizations improved. Al-Amyan's field study aimed at identifying the trends towards the application of block chain technology and its impact on supply chain performance in mining industry sector in Jordan. A sample composed of 83 respondents of employees in mining industries sector in Jordan was used. Results of the study showed that the mining industries sector does not apply the features of blockchain technology which include the decentralization, transparency and trucking. Accordingly, managers and employees working in mining industries sector in Jordan were recommended to be aware of the importance of applying the features of blockchain technology including the decentralization, transparency and trucking. Moreover, the study recommended further that current employees shall be trained for dealing with this technology in a manner that is compatible with tasks of their jobs in order to improve the performance level. In addition, a detailed feasibility study model of blockchain shall be necessarily developed.

The previous studies have illustrated various digital technologies of the fourth industrial revolution. However, this study examines a set of the digital technologies and their impact on the

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banking accounting system. Based on the aforementioned, the technical accounting processing has reached its highest levels and no dividing lines appear between (tangible) physical fields and (intangible) digital fields. In addition, digital transformation in services-i.e., providing the services via communication and smart devices that are used for analysing the data- has contributed to a provision of large volumes of data, analysis of data as well as decision-making. Furthermore, using decision support systems in addition to artificial intelligence systems has contributed to data analysis; it also has supported the features of the appropriate and reliable accounting information and the process of making appropriate and correct decisions.

MATERIALS AND METHODS

Methodology of Study

This research is quantitative based on the positivism philosophy. According to Hejase & Hejase (2013), "*Positivism is when the researcher assumes the role of an objective analyst, is independent, and neither affects nor is affected by the subject of the research*". Moreover, the study used a deductive approach in which data were gathered and then used in order to assess theoretical statements about the perceptions of the Jordanian bank sector in regard to digital technologies applied in banking accounting systems (Hoffman, 2017).

Population and Sample of Study

The population of this study consists of the banks in Jordan. The sample of the study is composed of 16 Jordanian commercial and Islamic banks. However, the foreign commercial and Islamic banks were excluded. In order to test the hypotheses of this study, 98 questionnaires were distributed to categories related to the accounting system namely; audit committee, internal auditor, financial manager, and manager of electronic information system department. All questionnaires were retrieved. However, three (3) questionnaires were excluded for being incomplete resulting in a final sample size of 95 questionnaires, achieving a response rate of 96.94% or about 97.

Questionnaire Design

The survey method was chosen because, "*it allows the collection of data from a large sample of respondents in a shorter amount of time and because it matched the safety requirements for conducting research during the COVID-19 pandemic*" (Nassar & Hejase, 2021). The research tool was a questionnaire, as stated earlier, and a five-level Likert scale was used in order to answer questionnaire's questions and test the hypotheses of study. Respondents had to choose one of five agreement possibilities to provide their responses. Each of the five the responses was coded with a numerical value to ease the statistical analysis as follows: 5- Strongly Agree, 4- Agree, 3- Neutral, 2- Disagree and 1- Strongly Disagree. In order to analyses the data, ranges have been used as follows: 1-1.79 indicates that there is no impact; 1.8-2.59 indicates that there is a low impact; 2.60-3.39 indicates that there is a moderate impact; 3.40-4.19 indicates that there is a high impact; and finally, 4.20-5 indicates that there is a very high impact. Furthermore, respondents' responses have been analysed using the Statistical Product and Service Solutions-SPSS (Hejase et al., 2021) SPSS is an IBM product since it was acquired by IBM in 2009.

Reliability of Study Tool

In order to ensure reliability of study tool, the Cronbach's Alpha coefficient was used to test for internal consistency. Table 1 show that Cronbach's alpha if items deleted all fall in the

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range 0.92 to 0.95 matching the range 0.9-1.0 labelled "*Excellent*" (Hejase & Hejase, 2013; Burns & Burns, 2008; Brown-Liburd & Vasarhelyi, 2015). According to Chehimi et al. (2019), "*This indicates a very good strength of association and proves that the selection of the questions is suitable for the questionnaire purpose*".

Table 1
INTERNAL CONSISTENCY (CRONBACH'S ALPHA) COEFFICIENTS OF STUDY FIELDS

Field	Internal Consistency
Impact of using robotics technology in banking transactions on the accounting system in Jordanian banks	0.94
Impact of using internet of things technology in banking transactions on the accounting system in Jordanian banks	0.95
Impact of using big data technology in banking transactions on the accounting system in Jordanian banks	0.92
Impact of using block chain technology in banking transactions on the accounting system in Jordanian banks	0.95
The challenges which face the Jordanian banks when using and applying the digital technologies	0.95
Impact of using the digital technologies on accounting systems in Jordanian banks	0.94

Data Analysis

All primary data collected were analysed using SPSS. Descriptive statistics were deployed showing arithmetic means and standard deviations reported in the form of tables as well as t-test analysis to assess the data statistical significance within 95% confidence level.

RESULTS AND FINDINGS

Result Analysis and Hypotheses Testing

First hypothesis testing

There is an impact relationship between the use of internet of things technology in banking transactions and the accounting systems in Jordanian banks;

To test the validity of this hypothesis, the arithmetic means and standard deviations of statements have been calculated as shown in Table 2.

Table 2
FIRST HYPOTHESIS ANALYSIS

Statement	A member of audit committee			Financial Manager			Electronic information system manager			Internal Auditor		
	A.M	S.D	R.O	A.M	S.D	R.O	A.M	S.D	R.O	A.M	S.D	R.O
Internet of things technology contributes to process easily monetary assets	3.52	0.74	High	3.67	0.78	High	4	1	High	3.56	1	High
Internet of thing technology contributes to easy tracking of cash and monetary assets	4	0.83	High	4	1	High	3.83	1.1	High	3.43	0.78	High
You have knowledge of internet of things technology and the importance of its use in accounting system.	3.58	0.67	High	3.75	0.89	High	4.08	0.9	High	3.83	0.83	High

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Internet of things technology has affected the nature of records and the so-called smart storage has appeared.	4	0.78	High	3.92	1	High	4.44	0.85	High	3.43	0.89	High
Internet of things technology can be used for identifying asset balances, particularly cash and cash equivalents.	3.75	0.72	High	4	0.75	High	3.75	0.97	High	3.43	0.89	High
Internet of things technology can be used for following up cash balances in all bank branches.	3.5	0.79	High	4	0.95	High	3.75	0.9	High	3.83	1.03	High
Internet of things technology contributes to a management of banking service cost.	3.42	0.62	High	4.5	0.98	High	3.75	0.9	High	3.63	0.78	High
Internet of things technology contributes to the forecasting of administrative accounting in the bank	3.42	0.79	High	3.53	1.06	High	4	0.67	High	3.67	0.65	High
Total	3.58	0.72	High	3.92	0.83	High	3.89	0.9	High	3.6	0.86	High
A.M: Arithmetic mean; S.D: Standard deviation; R.O: response Orientation												

Table 2 shows the following results and findings that are reported based on the respondents' categorization:

- **Respondents of audit committee members:** Highly agree that internet of things technology affects the banking accounting systems. The resultant arithmetic means have ranged between 3.42 and 4. Two statements scored 4.00 as the highest arithmetic mean "*Internet of thing technology contributes to easy tracking of cash and monetary assets*" and "*Internet of things technology has affected the nature of records and the so-called smart storage has appeared*."
- **Respondents of financial managers:** Agree highly that internet of things technology affects the banking accounting systems; arithmetic means have ranged between 3.53 and 4.5. The statement that scored the highest arithmetic mean of 4.50 was "*internet of things technology contributes to a management of banking service cost*."
- **Respondents of information technology system managers:** Agree highly that internet of things technology affects the banking accounting systems. Resultant arithmetic means have ranged from 3.75-4.44. Two statements scored the highest scores of 4.44 and 4.08, namely, "*Internet of things technology has affected the nature of records and the so-called smart storage has appeared*" and "*you have knowledge of internet of things technology and the importance of its use in accounting system.*"
- **Respondents of internal auditors:** Agree highly that internet of things technology affects the banking accounting systems. Resultant arithmetic means have ranged between 3.43 and 3.83. Two statements scored the highest arithmetic means of 3.83 namely, "*you have knowledge of internet of things technology, and the importance of its use in accounting system*" and "*Internet of things technology can be used for following up cash balances in all bank branches*."

Thus, it can be concluded that there is a high orientation agreement of respondents' responses from the point of view of all respondents' categories: internal auditor, audit committee member, financial manager and information technology system manager. Based on the aforementioned, it is illustrated that there is a high impact relationship between the use of internet of things technology and the banking accounting system.

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The next step was running the t-test for the arithmetic mean of responses of internal auditor, audit committee member, financial manager and information technology system manager compared with a standard arithmetic mean of 3.00. Table 3 shows the t-test results.

Table 3
HYPOTHESIS ONE ASSESSMENT WITH STANDARD MARK OF 3.00

First Hypothesis	Arithmetic Mean	Standard Deviation	T-Value	Statistical Significance
Internal auditors	3.580	0.720	3.293	0.007
Audit Committee members	3.920	0.830	2.617	0.024
Financial Manager	3.600	0.860	6.263	0.000
Information technology department manager	3.600	0.860	4.266	0.000

Table 3 indicates that there are statistical differences at (α=0.05) between arithmetic mean and standard mark 3 of the sample respondents' responses (audit committee members, financial manager, information technology department manager and internal auditor). Thus, this hypothesis stipulating that there is an impact relationship between the use of internet of things technology in banking transactions and the accounting systems in Jordanian banks, has been accepted. In fact, all resultant t-tests showed statistical significance at 5% (Sig.=.007, .024, .000 and .000 are less than 0.05

Second hypothesis testing

There is an impact relationship between the use of big data technology in banking transactions and the accounting systems in Jordanian banks

To test the validity of this hypothesis, the arithmetic means and standard deviations of statements regarding first hypothesis have been calculated as shown in; Table 4.

Table 4
SECOND HYPOTHESIS ANALYSIS

Statement	A member of audit committee			Financial Manager			Electronic information system manager			Internal Auditor		
	A.M	S.D	R.O	A.M	S.D	R.O	A.M	S.D	R.O	A.M	S.D	R.O
You have a knowledge of big data technology	4.1	0.74	High	4.1	0.78	High	4.5	1	High	4	1	High
You have a knowledge of the fields of the uses of big data technology in the banking accounting systems	4.1	0.83	High	4	1	High	4.44	1.1	High	3.99	0.78	High
Bid data technology is used for dealing with changing and conflicting data	3.58	0.67	High	3.63	0.89	High	4.08	0.9	High	3.83	0.83	High
Big data technology enables the banks to make predictions and compare alternatives	3.98	0.78	High	3.92	1	High	4.33	0.85	High	3.5	0.89	High
Big data technology enables the banks to increase the levels of transparency and integrity of reports	3.75	0.72	High	3.25	0.75	High	4.17	0.97	High	3.44	0.89	High
Big data technology	3.56	0.79	High	4	0.95	High	4	0.9	High	3.83	1.03	High

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contributes to achievement of the characteristics of accounting information												
Big data technology contributes to the provision of adequate and appropriate level of disclosure	3.42	0.62	High	3.53	0.98	High	4.12	0.9	High	3.63	0.78	High
Total	3.77	0.73	High	3.68	0.9	High	4.23	0.94	High	3.74	0.88	High
A.M: Arithmetic mean; S.D: Standard deviation; R.O: response Orientation												

Table 4 shows the following results and findings that are reported based on the respondents' categorization:

- **Respondents of audit committee members:** Agree highly that big data technology affects the banking accounting systems. Arithmetic means have ranged between 3.42 and 4.10. Two statements scored the highest arithmetic means of 4.10 namely, "*You have knowledge of big data technology*" and "*You have knowledge of the fields of the uses of big data technology in the banking accounting systems*."
- **Respondents of financial managers:** Agree highly that big data technology affects the banking accounting systems; arithmetic means have ranged between 3.25 and 4.1. Three statements (1, 2 and 6) scored the highest arithmetic means of 4.10 and 4.0 namely, "*You have a knowledge of big data technology*" [4.10], "*You have a knowledge of the fields of the uses of big data technology in the banking accounting systems*" [4.00] and "*Big data technology contributes to achievement of the characteristics of accounting information*" [4.00].It is noted that financial managers are aware of the role of using big data technology in improving accounting information quality.
- **Respondents of information technology system managers:** Agree highly that big data technology affects the banking accounting systems; arithmetic means have ranged between 4 and 4.50. Three statements (1, 2 and 4) scored the highest arithmetic means of 4.50, 4.44 and 4.33 namely, "*You have a knowledge of big data technology*" [4.50], "*You have a knowledge of the fields of the uses of big data technology in the banking accounting systems*" [4.44] and "*Big data technology enables the banks to make predictions and compare alternatives*" [4.33].
- **Respondents of internal auditors:** Agree highly that big data technology affects the banking accounting systems; arithmetic means have ranged between 3.44 and 4. Two statements (1 and 4) scored the highest arithmetic means of 4.00 and 3.99 namely, "*You have a knowledge of big data technology*" [4.00], "*You have a knowledge of the fields of the uses of big data technology in the banking accounting systems*" [3.99].

Thus, it can be concluded that there is a high orientation agreement of respondents' responses from the point of view of all respondents' categories: internal auditor, audit committee member, financial manager and information technology system manager. Based on the aforementioned, it is evident that there is a high impact relationship between the use of big data technology and the banking accounting system.

The next step was running the t-test for the arithmetic mean of responses of internal auditor, audit committee member, financial manager and information technology system manager compared with a standard arithmetic mean of 3.00. Table 5 shows the t-test results.

Table 5
HYPOTHESIS TWO ASSESSMENT WITH STANDARD MARK OF 3.00

Second Hypothesis	Arithmetic Mean	Standard Deviation	T-Value	Statistical Significance
Internal auditors	3.740	0.880	3.288	0.000
Audit Committee members	3.770	0.730	2.688	0.014
Financial Manager	3.680	0.900	6.263	0.000
Information technology department manager	4.230	0.940	8.063	0.000

Table 5 indicates that there are statistical differences at (α=0.0)) between arithmetic mean and standard mark 3 of the sample respondents' responses (audit committee members, financial

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manager, information technology department manager and internal auditor). Thus, this hypothesis stipulating that there is an impact relationship between the use of big data technology in banking transactions and the accounting systems in Jordanian banks, has been accepted. In fact, all resultant t-tests showed statistical significance at 5% (Sig=0.000, .014, 0.000 and 0.000 are less than 0.05).

Third hypothesis testing

There is an impact relationship between the use of block-chain technology in banking transactions and the accounting systems in Jordanian banks

To test the validity of this hypothesis, the arithmetic means and standard deviations of statements regarding first hypothesis have been calculated as shown in; Table 6.

Table 6
HYPOTHESIS THREE ANALYSIS

Statement	A member of audit committee			Financial Manager			Electronic information system manager			Internal Auditor		
	A.M	S.D	R.O	A.M	S.D	R.O	A.M	S.D	R.O	A.M	S.D	R.O
You have a knowledge of block chain technology	3.5	0.78	High	3.67	0.78	High	4	1	High	3.56	0.79	High
You have a knowledge of the fields of the uses of block chain technology in the banking accounting systems	3.48	0.83	High	3.65	1	High	4.1	1	High	3.43	0.78	High
Block chain technology is considered a change of the nature of accounting books	3.44	0.67	High	3.53	0.89	High	4	0.9	High	3.83	0.89	High
Using block chain technology increases the reliability of accounting information	3.4	0.78	High	3.92	1	High	3.92	0.85	High	3.43	0.89	High
Using block chain technology increases accounting information quality	3.4	0.72	High	4	0.75	High	3.4	0.97	High	3.33	0.89	High
Using block chain technology requires the skills which enhance the ability of automatization	3.44	0.79	High	3.38	0.95	High	3.92	0.9	High	3.83	1	High
Methods of accounting record of transactions are directly done by using a common ledger	3.41	0.62	High	3.4	0.98	High	3.75	0.9	High	3.63	0.78	High
Accounting records are transparently kept with a little margin of error	3.42	0.79	High	3.75	1	High	3.92	0.67	High	3.67	0.65	High
Total	3.43	0.74	High	3.66	0.91	High	3.88	0.89	High	3.53	0.82	High
A.M: Arithmetic mean; S.D: Standard deviation; R.O: response Orientation												

Table 6 shows the following results and findings that are reported based on the respondents' categorization: Respondents of audit committee members agree highly that blockchain technology affects the banking accounting systems; arithmetic means have ranged

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between 3.40 and 3.50. One statement scored the highest arithmetic mean namely statement 1, "*You have a knowledge of block chain technology*" [3.50].

- **Respondents of financial managers:** Agree highly that block-chain technology affects the banking accounting systems; arithmetic means have ranged between 3.40 and 4.00. Two statements 4 and 5 scored the highest arithmetic means namely, "*Using blockchain technology increases the reliability of accounting information*" [3.92] and "*Using blockchain technology increases accounting information quality*" [4.00].
- **Respondents of information technology system managers:** Agree highly that block-chain technology affects the banking accounting systems; arithmetic means have ranged between 3.75 and 4.10. Three statements 1, 2 and 3 scored the highest arithmetic means namely, "*You have knowledge of blockchain technology*" [4.00], "*You have knowledge of the fields of the uses of blockchain technology in the banking accounting systems*" [4.10] and "*Blockchain technology is considered a change of the nature of accounting books*" [4.00].
- **Respondents of internal auditors:** Agree highly that block chain technology affects the banking accounting systems; arithmetic means have ranged between 3.33 and 3.83. Two statements 3 and 6 scored the highest arithmetic means namely, "*Block chain technology is considered a change of the nature of accounting books*" [3.83]. and "*Using block-chain technology increases accounting information quality*" [4.00] and "*Using blockchain technology requires the skills which enhance the ability of automatization*" [3.83 Thus, it can be concluded that there is a high orientation agreement of respondents' responses from the point of view of all respondents categories: internal auditor, audit committee member, financial manager and information technology system manager. Based on the aforementioned, it is evident that there is a high impact relationship between the use of block-chain technology and the banking accounting system.

The next step was running the t-test for the arithmetic mean of responses of internal auditor, audit committee member, financial manager and information technology system manager compared with a standard arithmetic mean of 3.00. Table 7 shows the t-test results.

Table 7
HYPOTHESIS THREE ASSESSMENT WITH STANDARD MARK OF 3.00

Third Hypothesis	Arithmetic Mean	Standard Deviation	T-Value	Statistical Significance
Internal auditors	3.530	0.820	3.383	0.007
Audit Committee members	3.430	0.740	3.687	0.000
Financial Manager	3.660	0.910	8.277	0.000
Information technology department manager	3.880	0.890	6.883	0.000

Table 7 indicates that there are statistical differences at (α=0.0)) between arithmetic mean and standard mark 3 of the sample respondents' responses (audit committee members, financial manager, information technology department manager and internal auditor. Thus, this hypothesis stipulating that there is an impact relationship between the use of block-chain technology in banking transactions and the accounting systems in Jordanian banks, has been accepted. In fact, all resultant t-tests showed statistical significance at 5% (Sig.=.007, .000, .000 and .000 are less than 0.05).

Fourth hypothesis testing

There is an impact relationship between the use of robotics technology in banking transactions and the accounting systems in Jordanian banks To test the validity of this hypothesis, the arithmetic means and standard deviations of statements regarding first hypothesis have been calculated as shown in; Table 8.

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Table 8
HYPOTHESIS FOUR ANALYSIS

Statement	A member of audit committee			Financial Manager			Electronic information system manager			Internal Auditor		
	A.M	S.D	R.O	A.M	S.D	R.O	A.M	S.D	R.O	A.M	S.D	R.O
You have a knowledge of robotics technology and its impact on the accounting	3.6	0.74	high	3.67	0.78	high	4.15	1	high	3.56	1	High
Robotics technology will be used for manual and repeated accounting jobs	3.54	0.83	High	3.57	1	High	3	1	High	3.43	0.78	High
Using robotics technology will turn accounting jobs into consulting jobs.	3.58	0.77	High	3.53	0.97	High	4.08	0.89	High	3.83	0.83	High
Using robotics technology in the accounting contributes to automatic verification	3.55	0.88	High	3.5	1	High	4.14	0.8	High	3.43	0.89	High
Using robotics technology in the accounting saves time and effort and provides the accuracy.	3.75	0.77	High	4	0.75	High	4	0.8	High	3.33	0.49	High
Using robotics technology in the accounting increases the level of accounting information quality.	3.5	0.78	High	4	0.95	High	3.75	0.8	High	3.83	1	High
Using robotics technology in the process of accounting data entry contributes to an accurate collection of data.	3.4	0.82	High	3.88	0.98	High	3.75	0.8	High	3.63	0.78	High
Total	3.54	0.79	High	3.77	0.9	High	3.79	0.85	High	3.56	0.82	High
A.M: Arithmetic mean; S.D: Standard deviation; R.O: response Orientation												

Table 8 shows the following results and findings that are reported based on the respondents' categorization:-Respondents of audit committee members agree highly that robotics technology affects the banking accounting systems; arithmetic means have ranged between 3.40 and 3.60. Statement 5 scored the highest arithmetic mean of 3.75 "*Using robotics technology in the accounting saves time and effort and provides the accuracy*."

- Respondents of financial managers agree highly that robotics technology affects the banking accounting systems; arithmetic means have ranged between 3.50 and 4. Statements 5 and 6 scored the highest arithmetic means namely, "*Using robotics technology in the accounting saves time and effort and provides the accuracy*" [4.00] and "*Using robotics technology in the accounting increases the level of accounting information quality*" [4.00].
- Respondents of information technology system managers agree highly that robotics technology affects the banking accounting systems; arithmetic means have ranged between 3.75 and 4.15. Statements 1 and 4 scored the highest arithmetic means of 4.15 and 4.14, respectively. "*You have knowledge of robotics technology and its impact on the accounting*" and "*Using robotics technology in the accounting contributes to automatic verification*."
- Respondents of internal auditors agree highly that robotics technology affects the banking accounting systems; arithmetic means have ranged between 3.33 and 3.83. Statements 3 and 6 scored the highest arithmetic means of 3.83. "*Using robotics technology will turn accounting jobs into consulting jobs*" and "*Using robotics technology in the accounting increases the level of accounting information quality*."

Thus, it can be concluded that there is a high orientation agreement of respondents' responses from the point of view of all respondents' categories: internal auditor, audit committee member, financial manager and information technology system manager. Based on the

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aforementioned, it is evident that there is a high impact relationship between the use of robotics technology and the banking accounting system.

The next step was running the t-test for the arithmetic mean of responses of internal auditor, audit committee member, financial manager and information technology system manager compared with a standard arithmetic mean of 3.00. Table 9 shows the t-test results.

Table 9
HYPOTHESIS FOUR ASSESSMENT WITH STANDARD MARK OF 3.00

Fourth Hypothesis	Arithmetic Mean	Standard Deviation	T-Value	Statistical Significance
Internal auditors	3.560	0.820	4.233	0.000
Audit Committee members	3.540	0.790	2.777	0.000
Financial Manager	3.770	0.900	6.788	0.000
Information technology department manager	3.790	0.850	8.617	0.000

Table 9 indicates that there are statistical differences at (α=0)) between arithmetic mean and standard mark 3 of the sample respondents' responses (audit committee members, financial manager, information technology department manager and internal auditor. Thus, this hypothesis stipulating that there is an impact relationship between the use of robotics technology in banking transactions and the accounting systems in Jordanian banks, has been accepted. In fact, all resultant t-tests showed statistical significance at 5% (Sig=0.000, 0.000, 0.000 and 0.000 are less than 0.05).

Fifth hypothesis testing

There are challenges of using the digital technologies in the accounting system in the Jordanian banks.

To test the validity of this hypothesis, the arithmetic means and standard deviations of statements regarding first hypothesis have been calculated as shown in; Table 10.

Table 10
HYPOTHESIS FIVE ANALYSIS

Statements	A.M	S.D	R.O
Jordanian banks face various challenges due to the use of the digital technologies in the accounting system as follows:			
Inappropriateness (a lack) of the legislations which organize the transactions while using the digital technologies	4.55	0.61	High
A shortage of human resources which have appropriate academic qualification of the digital technologies	4.4	0.5	High
A shortage of human resources which have appropriate practical qualification and skills of the digital technologies	4.5	0.51	High
A lack of knowledge and skill of using the digital technologies among banks' clients.	4.37	0.49	High
Fears and mistrust of dealers towards the processes of dealing with the digital technologies	4.45	0.605	High
Weakness of information technology infrastructure	4.5	0.51	High
High cost of processes of electronic deliveries and payments	4.45	0.501	High
Total	4.45	0.535	High

Table 10 shows arithmetic means and standard deviations of the statements that formed the hypothesis. Arithmetic means have ranged between 4.37 and 4.55. Statement 1,

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"*Inappropriateness (a lack) of the legislations which organize the transactions while using the digital technologies*" scored the highest arithmetic mean of 4.55, whereas statements 3 "*A shortage of human resources which have appropriate practical qualification and skills of the digital technologies*" and 6 "*Weakness of information technology infrastructure*" with arithmetic means of 4.50 came second. Moreover, statement 4 "*a lack of knowledge and skill of using the digital technologies among banks' clients*", has occupied the last rank and its arithmetic mean has reached 4.37. Respondents of this study agreed very highly that there are various challenges of using the digital technologies in the banking accounting systems.

The next step was running the t-test for the arithmetic mean of responses of internal auditor, audit committee member, financial manager and information technology system manager compared with a standard arithmetic mean of 3.00. Table 11 shows the t-test results.

Table 11
HYPOTHESIS FOUR ASSESSMENT WITH STANDARD MARK OF 3.0

The challenges related to the use of the digital technologies in the banking accounting system	Arithmetic Mean	Standard Deviation	T-Value	Statistical Significance
	4.45	0.535	9.858	0.00

Table 11 indicates that there are statistical differences at (α=0.05)) between arithmetic mean and standard mark 3; T-value has been 9.858; statistical significance has been 0.000. Thus, this hypothesis stipulating that there are challenges of using the digital technologies in the accounting system in the Jordanian banks has been accepted.

Table 11 indicates that there are statistical differences at (α=0) between arithmetic mean and standard mark 3 of the sample respondents' responses (audit committee members, financial manager, information technology department manager and internal auditor. Thus, There are challenges of using the digital technologies in the accounting system in the Jordanian banks, has been accepted. In fact, the resultant t-test showed statistical significance at 5% (Sig=0.000, less than 0.05).

CONCLUSION

Conclusion

Digital technologies have caused fundamental changes on the concepts of the banking accounting information systems. These technologies are considered integrated systems whereby robotics technology contributes to accurate and quick collection of data whereas internet of things technology sends the data via encrypted networks. In addition, blockchain technology has an ability to create a huge volume of data which can be technically saved by an electronic cloud. The current study has concluded a set of results as follows:

- There is a high statistically significant impact relationship between the use of internet of things, big data, block-chain, and robotics technologies on the banking transactions and the accounting systems in Jordanian banks.
- There are statistically significant challenges of using the digital technologies in the accounting system in the Jordanian banks. These challenges include the legislations, technical infrastructure as well as a shortage of human resources, practically and academically qualified in the digital technologies, and a lack of knowledge of digital technologies among the clients.

Recommendations

The study has reached a set of recommendations:

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- University Programs and plans of digital technologies must be developed. Moreover, Universities need to offer training courses that include the digital technologies as applied to financial accounting practices and tools that are mostly used in Jordanian banks,
- A clear theoretical framework of accounting and disclosure shall be developed when using the digital technologies in business environment in general and banking business environment in particular,
- Banks need to pay attention to the development of information technology and internet infrastructure in order to use the appropriate digital technologies, and
- Policy makers need to pay attention to the continuous upgrading of a system of legislations which organize the digital technologies in general and banking digital processes in particular. The aforementioned is needed in order to encourage the clients to use these technologies.

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