



ELIT

Economic Laboratory Transition
Research Podgorica

Montenegrin Journal of Economics

Haddad, H. (2021), "The Effect of Artificial Intelligence on the AIS Excellence in Jordanian Banks", *Montenegrin Journal of Economics*, Vol. 17, No. 4, pp. 155-166.

The Effect of Artificial Intelligence on the AIS Excellence in Jordanian Banks

HOSSAM HADDAD¹

¹ Assistant Professor, Middle East University, Faculty of Business, Accounting Department, Amman, Jordan.
e-mail: Hhaddad@meu.edu.jo

ARTICLE INFO

Received January 20, 2021
Revised from February 19, 2021
Accepted March 22, 2021
Available online December 15, 2021

JEL classification: D83, G21, H61, M41

DOI: 10.14254/1800-5845/2021.17-4.14

Keywords:

Artificial intelligence,
Expert Systems,
Machine Learning,
Accounting Information
System excellence,
Quality of Accounting Information
interpretation,
Jordanian Banks.

ABSTRACT

Artificial intelligence technologies have revolutionized the field of information technology thru the creation of smart devices and programs that work and interact like humans. It is related to a field of science that aims to provide machines with the ability to perform functions such as logic, planning, learning, and perception. In this sense, the accounting discipline was affected by artificial intelligence in the restructuring of business models and business processes. This study aims to debate how (AI) Artificial Intelligence affects the Accounting information system (AIS) excellence in Jordanian banks. This research is a survey study, and a questionnaire was used for data collection. The sample of the study encompasses all the 13 commercial banks in Jordan, the questionnaire was designed based on the Likert scale was forwarded to the accountant, managers, and internal auditors at the 13 targeted banks. The number of respondents was 278. A reliability test, a correlation matrix, and linear regression used by using SPSS 25. In light of those results, the study reached several recommendations, including the need to enhance the use of artificial intelligence in the banks to raise the excellence of the banks, and that the banks' administration should assist expert Jordanian systems in acquiring knowledge from the reality of knowledge bases systems stored in many areas that support senior management. In this research, closing discussion is provided for academic contribution might help the professionals and academics to carry out and improve artificial intelligence steps and AIS in financial sector.

INTRODUCTION

In the current era, accounting has witnessed a remarkable development resulting from the development of technology, it now uses information and communication technology (ICT) tools to carry out most of the accounting tasks, and these tools include audit tool kits, checklists, audit programs (capable of analyzing and testing data in depth), and integrated audit oversight units (programming procedures) that continuously monitor real data and processing conditions, expert systems, and internal control templates that are used Usually identifying system strengths and weaknesses. Artificial intelligence appeared for the first time in 1955 in the program Theoric "Theorist", which was created by Herbert Simon, Allen Newell, and John Shaw, and was designed to "imitate human problem-solving skills" (logic theory). During the

past twenty years of this program, the other developments in artificial intelligence were flourishing, as computer scientists have a better understanding, and storage capacity in computers has increased, which has provided a delightful opportunity for accountants and saved them the trouble of searching through large amounts of data every day as part of their job. Understand, what made this technique essential online significantly (Palomares et al., 2021).

With the increase in the economic needs of society, which was accompanied by a rapid development in information technology, we reached the golden age of artificial intelligence; the application of this technology in the field of accounting has become an inevitable trend, which will lead to significant changes in the accounting industry and its development (Luo et al., 2018). The dependence on intelligence applications for its artificial application is mainly due to more than 25 years in the fields of financial reporting, auditing and other accounting fields (Vlacic, et al., 2021).

During the past few decades, there has been a gradual technological development aimed at creating "artificially intelligent" systems, and the perception of artificial intelligence and its usefulness has been the subjects of discussion in academia and business practice, through the introduction of modern technologies that ultimately achieve radical changes in processes and reorganization all industries make substantial investments in these areas (Lin, 2021). The rapid development of artificial intelligence technology has attracted global attention; because of its great impact on every corner of the world, its impact has become noticeable as a simple alternative to human work to a gradual impact on people's daily lives. It is expected that the human component will be laid off and most jobs handled by robots in the upcoming years; therefore, the primary accounting practitioners are one of the groups that will be affected by AI (Geisel, 2018).

Despite the dependence of accountants on computers and initial computing for many years ago in order to raise the efficiency and effectiveness of their business, technology has not been able to replace the knowledge possessed by experts in decision-making and decision-making (Issa, et al., 2016). In other words most institutions, especially financial institutions especially banks recently went to automate their business to adapt to the competitive environment around them to ensure survival (Oláh et al., 2020). Regardless of the significant impact that automation has on speeding up operations, achieving quality and reducing costs, this effect remains limited to routine or low-skilled tasks. Therefore, banks have directed to use new technologies such as artificial intelligence that work to implement non-routine cognitive tasks performed by skilled accountants. Through artificial intelligence, companies in all sectors and sizes can access the technology that provides accountants and professional business owners with great efforts from daily financial and service task. In addition to its ability to use historical experience to know possible future effects, artificial intelligence is an entity that carries many positive and negative impressions, and as its benefits multiply, it also has many risks, and these risks are formed in banks for example in the manipulations of those systems, especially accounting systems. However, the benefits of using AI outweigh its risks, especially in business applications (Geisel, 2018). it is mainly based on the level of artificial intelligence used, and therefore the degree of risk resulting from its use depends on the efficiency of accounting systems with all its components and dimensions, they are what they define and contain. In order to fill the gap this study has been conducted to investigate the use of AI on the AIS excellence Jordanian banks.

1. TECHNICAL LITERATURE REVIEW

1.1 Artificial intelligence (AI)

Artificial intelligence technologies have revolutionized the field of information technology, because artificial intelligence is a sub-field of computer science, which allows the creation of smart devices and programs that work and interact like humans (Kamble and Shah, 2018). It is a commonly used noun to refer to a field of science that aims to provide machines with the ability to perform functions such as logic, planning, learning and perception. Although this definition refers in its content to "machines", it can be applied and generalized to "any kind of living intelligence", and accordingly, the meaning of artificial intelligence can be expanded to include a group of different and interlocking abilities, such as creativity,

emotional knowledge and self-awareness (Kitsios and Kamariotou, 2021). The steady acceleration of the evolution of strategic AI leads to the restructuring of their businesses and their models, which supports the association and overlap of AI with business processes, but the consequences of this adoption are still almost unknown (Diener and Spacek, 2021).

AI is a branch of computer science, concerned with the creation of computer systems that display a form of intelligence and its study, in other words, it is "systems that learn new concepts and tasks, and can think and draw conclusions", and they can understand an audio language or realize a visual scene and perform. Other types of influences that require human intelligence, and artificial intelligence means the study of ideas that will form machines capable of simulation in line with the traditional responses of humans, given the human ability to intent, think and conclude (Shukla and Vijay, 2013). Haenlein and Kaplan (2019) defined artificial intelligence as a machine that understands and interprets sounds and languages, works to solve problems, can diagnose medical conditions, control road traffic, play games like chess, and imitate impressionist images of paintings. Mostly, its definition of artificial intelligence is intended "A system that possesses the ability to perform tasks usually associated with living things. Kitsios and Kamariotou (2021) also defines AI as that field of study that depicts the skill of machine learning just like humans, and examines the ability to respond to some behaviors also known as artificial intelligence While Poola (2017) defines it as developing more sophisticated complex systems that have the potential to outdo humans in multiple ways. Payne et al., (2021) stated that artificial intelligence is capable of changing human life and almost everything that relates to it, such as economics, manpower, wars, communications, health services, privacy, security and even ethics, among others. The AI specialization has also been considered as an academic field that studies how to create computers and computer software capable of performing and behaving in an intelligent manner. The AI technologies and applications have effected the financial sector by changing the way of transactions. However, several methods have been carried out to improve the value creation by adopting new technologies and integration the AI with financial services (Gomber et al., 2018).

Artificial intelligence is described in four different dimensions. Includes intelligence, research, business and programming; Artificial intelligence from a smart dimension requires machines to operate in the way humans are expected to perform after research and work (Duan et al, 2018). In this light, artificial intelligence is defined as the advanced technology used in commercial banks in Jordan, which contributes to managing operations and tasks with more sophisticated and intelligent mechanisms than the man who created them and gives them knowledge and sensory ingredients, in order to help them to learn automatically and develop themselves. The study relied on a number of dimensions of artificial intelligence, which are;

- A. Expert systems (ES) (Kwak et al., 2021; Kerzel, 2021) pointed out that the expert systems as "techniques that work to discover solutions." for problems that require specialized knowledge and skill, the system works in an expert thinking style his skill, and his motivation to imitate them." Therefore, expert systems techniques are different types of approaches. Artificial intelligence (AI), in which the components of decision-making and decision-making are recorded. It is a group of artificial intelligence software adopted in the 1980s, reaching a level of expertise capable of replacing human specialization in a particular area of decision-making; Expert systems are easily and widely used for artificial intelligence technology. This involves computer programming that simulates the way an expert in a particular field thinks (chukwudi, 2018).
- B. Knowledge representation and inference (KRI) (Fraij et al., 2021) stated that It means that the artificial intelligence system should be artificially capable of adapting to its environment, acquiring knowledge that describes this environment, and storing knowledge in a manner that allows a quick and adequate response to any stimulus generated by the environment. Briefly, it means the form of knowledge representation and the method of obtaining it. The knowledge representation and procedural inference has expressed the ability of smart systems to adapt with its environment, knowledge acquisition and storage, ease of reflection and use of time required. Knowledge representation and inference is of great importance for intelligent data processing, especially if the volume of data is huge or the data itself is complex. In the reality, the ability to solve depends problems with the knowledge available in the field, and with the increase in the volume of data, data systems have become contemporary intensive requires intelligent data processing, based on a strong core knowledge

representation and the logic used by such systems in the tasks of interpretation and analysis (Arevallillo-Herráez et al., 2013). Representation of knowledge and logical inference emerges in the field of artificial intelligence interested in how representing knowledge symbolically and automatically processing it by means of thinking programs, and it is - informally - part of artificial intelligence that is concerned with thinking and how it contributes to intelligent behavior (Greenman, 2017). It also shows the role of knowledge representation and logic in achieving interrelationship between human knowledge and its representation through computer programming languages (Fraij et al., 2021).

- C. Machine Learning (ML) is defined as a multiplex, multidisciplinary field of development and research that includes various methods from computer science, AI, statistics, and biology. Its submissions to the banking sector are being accustomed with the aim of improving services and products for their customers (Bertomeu et al., 2021). Machine learning have defined as one of the significant branches of artificial intelligence which means automating and improving the process of learning computers based on their experiences without being actually programmed, and without human assistance; by building first learning models using data and various algorithms, which depend on the nucleus of data.

1.2 Accounting Information System (AIS) Excellence

The presence of Accounting Systems has become a must in the current era, particularly in the light of the social and economic conditions that the world lives and in the light of the tremendous development, this is due to the positive factors provided by these systems that are reflected in the administration and its business, and this is what drives all those who work in the economic sectors to adopt the accounting system, especially in the banking fields and finance. Technology has contributed to the development of financial and banking fields, especially with the spread of communication networks that have contributed to linking all furry companies and making the world a small village, which has positively affected the speed, reduced costs and the expansion of customers. (Oláh et al., 2019). The administrative systems and everyone associated with them need these accounting systems. In order to provide it with financial statistics and information through which companies' products are analyzed, and based on this information and data companies are taking appropriate actions, and the accounting system has evolved from what it was in the past, as in the past, it was a simple notebook in which financial transactions were recorded for the company, and today it has become a system in itself, linked to data analysis and information provision thus saving time and contributing to making appropriate decisions, and provides the enterprise with reports which clarifies the position of the company in all aspects, including profit or loss (Fraij et al., 2021).

Efficiency is a general term through which everything related to knowledge and skill can be harnessed in order to develop a meaningful, successful, and organized scheme for any work, and it provides permanent development, which makes the company keep pace with any new activities and skills; Therefore, competence is considered an advanced element of knowledge and experience, and it must be available before any element or factor of development is available. Efficiency makes any institution capable of producing distinctive and brilliant services through the least available number of resources and raw materials, in addition to achieving good progress, and raising the level of the institution in the competition market always along times and days. (Oh and Ko, 2018).

While (Beg, 2018) defined it as a mixture of people, machines, methods, and skills that come together to generate data and information for the benefit of work. Many factors and subsystems work together in one trench in order to illustrate appropriate and correct information that helps the management of the institution in taking policies and appropriate administrative procedures in a system. The efficiency of the accounting systems has a various dimensions, which are:

- A. Complete Information Collaboration (CIC): An integrated accounting system is a combination of financial accounting functions united in one application. The substitution of several programs or systems aims towards the benefit of the accounting management purposes, for instance, cutting costs and eliminating the need of records and books for costing and ordering. The structures of accounting systems are similar in most companies and institutions, and what distinguishes each company from the other is the intent of the transactions that it performs. So, the task of the accounting system is one in

every organization; they collect work-related information and data, make it available to all users, and promote that with software that meets the needs of the business. (Shaffer et al., 2020)

- B. Complete Information System Linkage (CISL): Information and data are basically made up of several parts linked together in order to reach a common goal that has been identified within the works, activities and functions described in an environment (Thapayom, 2015). This means that the parts of this system were not assembled by chance or in a random way, but rather were collected through a deliberate and coordinated interconnection in order to reach the goals pursued by the accounting system. The interconnectedness of the accounting information system means, "Increasing the effectiveness of the systems available in the organization, by linking the different functional systems to the Internet, and various databases, which contributes to increasing the effectiveness and efficiency of the various functional systems by linking them and the exchange of information."
- C. Accurate Business Information Interpretation (ABII): Accuracy of accounting business means "the degree to which the data resulting from the accounting information system is free from errors, and these errors are related to the registration and the account." (Ashok et al., 2019) Accuracy is considered one of the most important criteria for the efficiency of the accounting system, and accuracy in the accounting system assumes the absence of any items that have not been clarified and explained in revenues and expenditures, and accuracy excludes estimating these items in an exaggerated manner, or valuing something at less than its true value, and accuracy requires impartiality when displaying data and information.
- D. Quality of Accounting Information Interpretation (QAI): The user has the right to be informed of the data and information; so, you must clarify the information and expected actions; so that the user is aware, and is using the procedures and measures that suits and benefits him, otherwise this information will be useless (Fraij et al., 2021). The quality of the interpretation of the information is essential, fundamental, and imperative as it is linked to making decisions and measures related to quality. Not to mention, that users need information and data that meet their needs; because it is related to what they will take in terms of measures and decisions (Wisna, 2018).
- E. Comprehensive Accounting Information Presentation (CAIP): The quality of accounting information presentation means: "Ease of obtaining the report in a timely manner or presenting the information under homogeneous headings or in a manner that does not require further explanation and narrowing them when used, and this requires the availability of four characteristics: consistency, impartiality, timing, and transparency. This principle is one of the most important principles of the efficiency of the accounting system, and it means that all information and data contained in the periodic and annual financial reports are correct, truthful, honest, accurate, impartial, and free from fraud, deception and error, and the importance of this is reflected in the transactions as they change from time to time; that is why the periodic and annual reports should be accurate, honest and other features that we mentioned, and this must be a characteristic of all the data, events, transactions and statistics contained in it (Bakarich and O'Brien, 2020).

1.3 Jordanian Banking Sector

Pakurár et al., (2019) pointed out that the banking sector began in Jordan after the end of the British occupation, when the Central Bank of Jordan was established in 1964. Today, the Central Bank of Jordan works to regulate the financial operations of banks operating in Jordan. It is considered an independent legal entity owned by the Jordanian government. Its tasks include supervising banks, issuing banknotes and currencies, providing liquidity, managing reserves, and maintaining economic stability (CBJ, 2021).

There are three main types of banks operating in Jordan. There are 13 commercial banks, 4 Islamic banks, and 7 foreign banks. It should be noted that the focus of this study is the commercial banks. The Jordanian banking sector has developed through its services provided to customers. Banks are working to attract customers by increasing the number of their branches to cover geographical locations by creating a network of branches consisting of 862 branches and 86 offices. Banks tend to use technology mainly and increase the number of ATMs in city centers, shopping centers and dynamic locations. Customers from withdrawing, depositing, inquiring about the balance, and other banking services (ABJ, 2021).

1.4 Development Hypothesis

Based on the discussion above, it seems that there is a debate about the effect of AI on AIS excellence. Most of the previous studies indicated that AI (ES, KRI, ML) affect the AIS excellence. Therefore, we assume that the AI effect the AIS excellence of commercial banks in Jordan. Consequently, and based on the below assumptions, the following hypotheses can be derived:

H₀₁. There is no significant impact of Artificial Intelligence factors on AIS excellence for complete information collaboration.

H₀₂ There is no significant impact of Artificial Intelligence factors on AIS excellence for complete information system linkage.

H₀₃ There is no significant impact of Artificial Intelligence factors on AIS excellence for accurate business information interpretation.

H₀₄ There is no significant impact of Artificial Intelligence factors on AIS excellence for quality of accounting information interpretation

H₀₅ There is no significant impact of Artificial Intelligence factors on AIS excellence for comprehensive accounting information presentation.

As mentioned earlier, this study will test the impact of AI (ES, KRI, ML) on the AIS excellence (CIC, CISL, ABII, QAII, CAIP) in commercial banks in Jordan. Figure 1 shows the conceptual framework of the study variables regarding the independent variables which is the AI while the dependent AIS excellences.

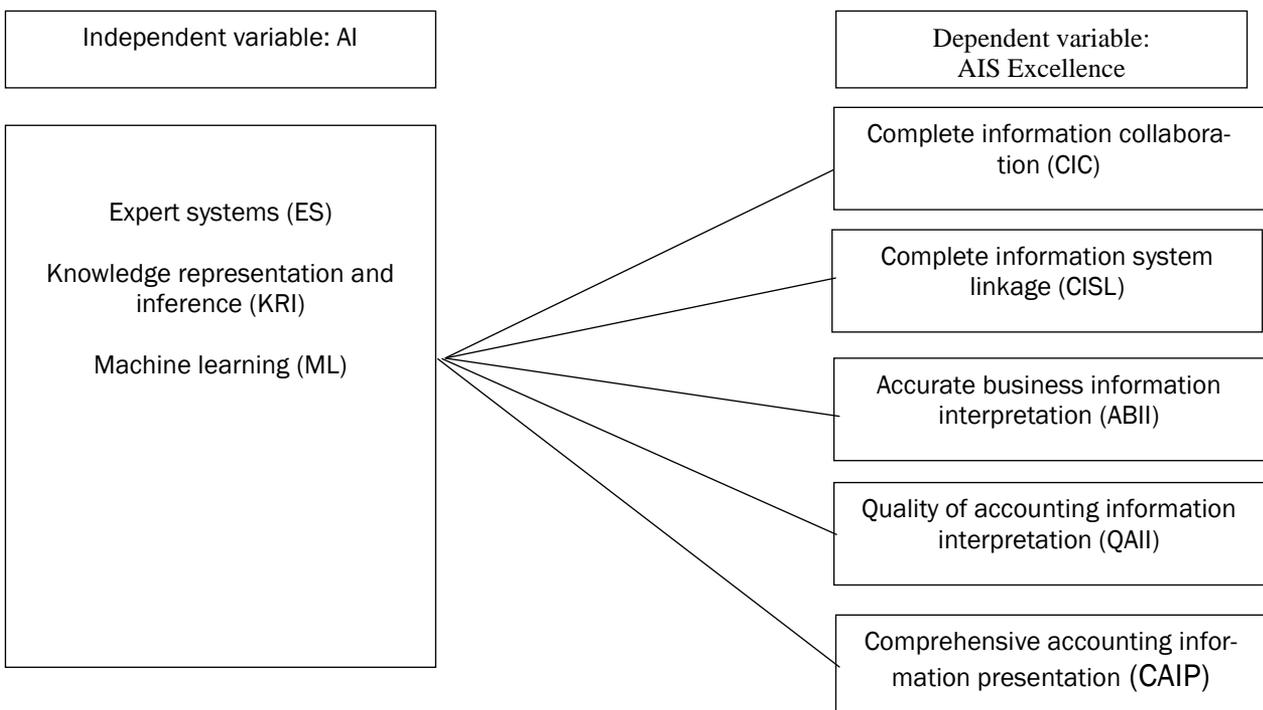


Figure 1. Conceptual Model of Artificial Intelligent and AIS Excellence
Source: Created by author based on (Thapayom, 2015; Graham, 1999),

3. METHODOLOGY

3.1 Data collection

It is an adopted questionnaire' it was distributed to managers and heads of departments at the Jordanian commercial banks (this research is a survey study). The number of respondents was 278. The questionnaire submitted by email and personally to all the participants. The study is a cross-sectional

one conducted in the first half of 2021. A pilot study was carried out by sending the questionnaire to 35 managers and accountants who were included in the survey to get their notes and recommendations about the questionnaire according to their experience. A Likert 5-point scale was used in questionnaire designing. Table 1 shows constructs that will be used to express the independent variables artificial intelligence with its symbol and dependent variables that accounting information system excellences in this research

Table 1. Selected Artificial Intelligence and Accounting Information System Excellence indexes

<i>Artificial Intelligence index</i>	<i>Ticker</i>
Expert System	ES
Knowledge representation and inference	KRI
Machine Learning	ML
<i>AIS Excellence Index</i>	<i>Ticker</i>
Complete information collaboration.	CIC
Complete information system linkage	CISL
Accurate business information interpretation	ABII
Quality of accounting information interpretation	QAIL
Comprehensive accounting information presentation	CAIP

3.2 Measures

Based on Graham (1999) model, artificial intelligence is measured as an independent variable, which contains expert systems (ES), knowledge representation and inference (KRI) and machine learning (ML). whereas, the dependent variable is accounting information system excellence which consists of complete information collaboration, complete information system linkage, accurate business information interpretation, quality of accounting information interpretation and comprehensive accounting information presentation (Thapayom, 2015).

4. ANALYSIS AND RESULTS:

The sample of this study shows that 53.5% of the respondents are male and 46.4% are female. Further, the academic level: it is clear that 56.83% holds a Bachelor's degree, and that 27.33% are holding Post Studies, and that 15.82% have obtained diploma. The results indicated that the majority of sample's subjects have Bachelor's which is considered most of the Banks' employees are well educated. The study sample by age year's groups: it is clear that 26.97% of the study sample aged less than 29 years, and 39.9%, ranging from 30 to less than 40 years, and 19.87%, ranging from 41 to less than 50 years, while 13.30% are larger than 50 years. The results indicated that most of samples 'subjects are in the middle age. Regarding the Career position distribution the result indicates that accounted for 68.70% are Accountant, and 20.14% are head of department and financial managers, while 11.15% are auditors.

Table 2. Sample Characteristics

<i>Demographical Data</i>		<i>Percentage</i>
<i>Age</i>	Male	149
	Female	129
<i>Educational Level</i>	Diploma	44
	Bachelor	158
	Post Studies	76
<i>Age</i>	25-29	75
	30-40	111
	40 -49	55
	50 and Above	37
<i>Position</i>	Accountant	191
	Manager	56
	Auditor	37

4.1 Reliability and Validity

To emphasize, how much the items in measuring the variables are related to each other, the reliability test was conducted. The findings indicated that the Cronbach's alpha values for all scales were greater than the minimum acceptable alpha value of 0.60 – 0.70. This means that the scales used in this study were internally consistent of the questionnaire. As stated to the results of this study, the used measurement is reliable, because of the results of alpha equals (0.70) or more, hence, it is accepted (Haddad, 2017).

Table 3. The Ratability Test

Variables	Coefficients
The effect of AI on CIC	0,882***
The effect of AI on CISL	0,753***
The effect of AI on ABII	0,746***
The effect of AI on QAII	0,870***
The effect of AI on CAIP	0,888***

The summary of variables used in this study is presented in Table 4, which consists of the number of observations, mean and slandered deviation.

Table 4. Descriptive statistics for tested variables

Variables	N	Items	Mean	Std. Deviation
Overall AI	278	17	3.8728	0.71324
CIC	278	5	4.0223	0.73838
CISL	278	4	4.7761	0.74683
ABII	278	4	3.4442	0.76801
QAII	278	6	3.6097	0.85540
CAIP	278	6	3.9376	0.77601

The results of descriptive statistics show that there are 278 responded questionnaires, the overall average for AI records a value of 3.87 with a standard deviation of 0.713, this result indicated that most of the sample size is agreed on answering the AI items as follow ES:5, KRI:6, ML:6 items. The overall average and standard deviation for CIC record values of 4.02 and 0.738 respectively, this result indicated that most of the sample size is agreed on answering the AI items with 5 items of CIC. On the other hand, the overall average AI and standard deviation for CISL record values of 4.77 and 0.746 respectively. That means most of the sample size is agreed on answering the AI items with 4 items of CISL. Moreover, the overall AI average and ABII record values of mean 3.44 and standard deviation of 0.768. That clarified that most of the sample size is agreed on answering the AI items with 4 items of ABII. Also, the AI average and QAII record values shows mean of 3.60 and standard deviation of 0.855. That explain that most of the sample size is agreed on answering the AI items with 6 items of QAII. Finally, the AI average and CAIP record values shows mean of 3.93 and standard deviation of 0.77. That implies that most of the sample size is agreed on answering the AI items with 6 items of CAIP.

Table 5. The linkage between the variables

Variables	AI	CIC	CISL	ABII	QAII	CAIP
AI	1					
CIC	.852**	1				
CISL	.719**	.795**	1			
ABII	.693**	.637**	.606**	1		
QAII	.725**	.704**	.642**	.733**	1	
CAIP	.798**	.794**	.718**	.657**	.778**	1

** Correlation is significant at the 0.01 level (2-tailed).

The association between the variables is employed and shown in Table 5. The Pearson correlation was employed to test the relationship between the AI factors and AIS excellence dimensions. It can be observed that the highest correlation value was 0.852 between AI and CIC; this indicated that there is a significant and positive relationship between AI and CIC, meaning that if AI increased by 100%, the CIC will increase by 85.2% and if AI decreased by 100%, the CIC will decrease by 85.2%. In the second rank, we can notice that the highest correlation value was 0.798 between AI and CAIP; this indicated that there is a significant and positive relationship between AI and CAIP, meaning that if AI increased by 100%, the CAIP will increase by 79.8% and if AI decreased by 100%, the CIC will decrease by 79.8%. In the third level the highest correlation value was 0.725 between AI and QAll; this indicated that there is a significant and positive relationship between AI and QAll, meaning that if AI increased by 100%, the QAll will increase by 72.5% and if AI decreased by 100%, the QAll will decrease by 72.5%. The next highest correlation value was 0.719 between AI and CISL; this indicated that there is a significant and positive relationship between AI and CISL, meaning that if AI increased by 100%, the CISL will increase by 71.9% and if AI decreased by 100%, the QAll will decrease by 71.9%. Lastly, the correlation value was 0.693 between AI and ABII; this indicated that there is a significant and positive relationship between AI and ABII, meaning that if AI increased by 100%, the ABII will increase by 69.3% and if AI decreased by 100%, the QAll will decrease by 69.3%. Finally, the lowest value of correlation was observed between CISL and ABII which records a significant probability value of 60.6%. This indicated that when CISL increases by 100%, the ABII will also move to the same direction by 60.6% and vice versa.

In order to explore the impact of artificial intelligence on the AIS excellence in Jordanian Banks, the regression analysis was conducted. The results of regression analysis are shown in Table 6.

Table 6. Relationships between the study variables AI components on the AIS Excellence Dimensions

(Constant)	CIC	CISL	ABII	QAll	CAIP
	0.597	0.848	0.556	0.253	0.632
ES	0.169***	0.124**	0.193***	0.197***	0.171***
KRI	0.249***	0.198***	0.251***	0.288***	0.33***
ML	0.462***	0.429***	0.301***	0.379***	0.353***
R ²	0.735	0.727*	0.481	0.528	1.932
Durbin-Watson	1.958	1.983	2.054	1.901	2.68
VIF values	are less than 0.10 for all variables				

*In terms of CIC, the coefficient of determinations (R²) value is 0.735 this implies that on average the variability in the AI factors for this research, can explain 73.5% of the variability in the CIC. This means that there is 26.5% are external factors that were not included in the model. The Durbin Watson test was employed to investigate the autocorrelation between the variables; the value of Durbin Watson showed that there is no autocorrelation between the variables. Furthermore, the variance inflation factor is used to test the autocollinearity which shows that all values are less than 10, meaning that there is no autocollinearity.

*The assumptions for all models were accepted.

When employing CIC, the results showed that the ES, KRI and MI positively and significantly affect the CIC, which reported coefficient values of 0.169, 0.249 and 0.462 respectively. Similarly, results advocated that ES, KRI and MI positively and significantly influence the CISL, which showed coefficient values of 0.124, 0.198 and 0.429 incrementally. In the same vein, the ES, KRI and MI positively and significantly influence the ABII, which revealed coefficient values of 0.193, 0.251 and 0.301. What's more, ES, KRI and MI positively and significantly influence the QAll that reported coefficient values of 0.197, 0.288 and 0.379, see Table (6).

4.2 Discussion

The result of the study clearly shows the effect of AI on the AIS excellence in Jordanian banking sector. The study showed that expert systems are designed through the use of human expertise in handling accounting events and processes, because banking systems cannot perform without human power in controlling banking financial policies. On the other hand, expert systems help in obtaining

knowledge from the reality of stored knowledge databases. Regarding the knowledge representation and inference (KRI) of the Artificial intelligence dimension it allows storing knowledge quickly and adequately, and this indicates the efficiency of the accounting systems in Jordanian banks in their speed and storage efficiency. On the other hand, knowledge and inferences are represented according to specific criteria by the bank, and the reason for this is that knowledge and inferences are acquired from the regulatory environment and therefore are not specific. This result is in line with (Thapyom, 2015).

The machine learning indicates that the systems within the bank update themselves periodically and automatically due to the policies. The bank does not tolerate any room for error, so it is programmed to occur and automatically save for return. It is referred to when any network error or problem occurs, and the systems are linked to each other simultaneously, in an integrated and interactive manner, due to the different tasks of each system in the bank, which is consistent with a study (Othmani, 2019).

Since the efficiency of the accounting systems has occurred and the complete information system linkage CISL indicated that, the accounting information must be integrated between the departments of banks. Reason that, it depends on the accumulation of information, especially the financial information related to deposits and withdrawals, and the essence of the accounting process is in the banks and not in the quality of accounting information interpretation.

4.3 Implication

For all we know, the literature does not importantly discourse the synergistic role of AI on AIS excellences as strategic mechanisms to enhance the banking sector. This research contribute to the academic arena by providing evidence of the connections between AI to improve the AIS excellences. Regarding to practical implication, the result highlighted the importance to adopt the usage of artificial intelligence in the banks system to raise the excellence of performance on the other hand, banks' administration are recommended assist expert systems by assisting employees in acquiring knowledge from the bases systems storage that support senior management. Diffusion of knowledge and technical training for employees is highly recommended to keep improving their skills and performance.

5. LIMITAIONS AND FURTHER RESEARCH

In spite of its contributions, the present study like all the research papers has some limitations. First, in evaluating and analyzing the effects of AI on AIS efficiency. This study tested the impact of artificial intelligence on competence accounting systems in commercial banks in Jordan and excluded Islamic and foreign banks, which consider a limitation, therefore. Future research recommended considering a larger sample with a broader range of banks (Islamic and Foreign banks). Additionally, current study conducted in Jordan, other countries may have more or less technology that may draw a new result. Accordingly, it is recommended to be tested on different countries.

CONCLUSION

The most commonly used dimensions of AI are ES, KRI, and ML. Questionnaires were adopted to measure the effect of AI dimensions on AIS excellence. The results of this study pointed out that there is a positive influence of AI on AIS excellence components. The results revealed that the ES, KRI, ML have positively influenced the AIS excellence dimensions, which are (CIC, CISL, ABII, QAI and CAIP) in commercial banks of Jordan. As a result of the research, it can be stated that AI components systems support senior management and help to develop the higher capabilities in taking the appropriate decision in order to achieve long-term banking goals. Furthermore, expert systems help managers in the planning and decision-making process in the banks. Whereas the artificial intelligence of the banks is characterized by the ability to adapt to its knowledge environment. Regarding AIS excellence, the technology is considered a cornerstone to the banking sector and its transactions. Therefore, the bank's system can automatically address the problems it may encounter and handle logical and programmed

accounting errors by relying on the databases. Finally, accounting information systems are linked with the financial and administrative systems within the banks, which can easily produce financial statements in line with the international financial reporting standard.

ACKNOWLEDGEMENT

The authors recognize the funding from Middle East University, Faculty of Business, Amman - Jordan.

REFERENCES

- Association of banks in Jordan (2021), *Booklet of Association of banks in Jordan*, <https://www.abj.org.jo/> (accessed 15 June 2021).
- Arevalillo-Herráez, M., Arnau, D., Marco-Giménez, L. (2013), "Domain-specific knowledge representation and inference engine for an intelligent tutoring system", *Knowledge-Based Systems*, Vol. 49, No. 2, pp. 97-105.
- Ashok, M.L., Divyashree, M. (2019), "Emerging Trends in Accounting: An Analysis of Impact of Robotics in Accounting, Reporting and Auditing of Business and Financial Information", *International Journal of Business Analytics and Intelligence*, Vol. 7, No. 2, pp.28-34.
- Bakarich, K.M., O'Brien, P.E. (2021), "The robots are coming... but aren't here yet: The use of artificial intelligence technologies in the public accounting profession", *Journal of Emerging Technologies in Accounting*, Vol. 18, No. 1, pp. 27-43.
- Beg, K., (2018), "Impact of Accounting Information System on the Financial Performance of Selected FMCG Companies", *Asian Journal of Applied Science and Technology*, Vol. 2, Issue 3, pp. 8-17.
- Bertomeu, J., Cheynel, E., Floyd, E., Pan, W. (2021), "Using machine learning to detect misstatements", *Review of Accounting Studies*, Vol. 26, No. 2, pp. 468-519.
- Central bank of Jordan (2021), *Central Bank of Jordan an Overview*, <https://www.cbj.gov.jo/> (accessed 15 June 2021).
- Chukwudi, L. (2018), "Effect of Artificial Intelligence on the Performance of Accounting Operations among Accounting Firms in South East Nigeria", *Asian Journal of Economics, Business and Accounting*, Vol. 7, No. 2, pp. 1-11.
- Diener, F., Spacek, M. (2021), "Digital Transformation in Banking: A Managerial Perspective on Barriers to Change", *Sustainability*, Vol. 13, No. 1, pp. 2032-2058.
- Duan, Y., Edwards, S., Dwivedi, K. (2019), "Artificial intelligence for decision making in the era of Big Data—evolution, challenges and research agenda", *International Journal of Information Management*, Vol. 48, pp.63-71.
- Fraj, j., Haddad, H., Aburumman, N. (2021), "The Quality of Accounting Information System, Firm Size, Sector Type as a Case Study from Jordan", *International Business Management*, Vol. 15, No. 2, pp. 30-38. DOI: 10.36478/ibm.2021.30.38
- Geisel. A.,(2018), "The Current and Future Impact of Artificial Intelligence On Business", *International Journal of Scientific and Technology Research*, Vol. 7, No. 5, pp.116-122.
- Gomber, P., Kauffman, R.J., Parker, C., Weber, B.W. (2018), "On the fintech revolution: Interpreting the forces of innovation, disruption, and transformation in financial services", *Journal of Management Information Systems*, Vol. 35, No. 1, pp. 220-265.
- Graham C. (1999), *Business Information Systems: Analysis, Design and Practice*, 3 rd Edition, Harlow Addison-Wesley, London.
- Greenman, C. (2017), "'Exploring the impact of artificial intelligence on the accounting profession", *Journal of Research in Business Economics and Management*, Vol. 8, No. 3, pp.116-122.
- Haddad, H. (2017), "Impact of Human Competencies on Caritas Jordan Employees Performance", *Journal of Resources Development and Management*, Vol. 1, No. 28, pp. 57-71.
- Haenlein, M., Kaplan, A. (2019), "A brief history of artificial intelligence: On the past, present, and future of artificial intelligence". *California management review*, Vol. 61, No. 4, pp. 5-14.

- Issa, S., Vasarhelyi, M. (2016), "Research Ideas for Artificial Intelligence in Auditing: The Formalization of Audit and Workforce Supplementation", *Journal of Emerging Technologies in Accounting*, Vol. 13, No. 2, pp. 1-20.
- Kamble, R., Deepali, S. (2018), "Applications of Artificial Intelligence in Human Life", *International Journal of Research - Granthaalayah*, Vol. 6, No. 6, pp. 32-44.
- Kitsios, F., Kamariotou, M. (2021), "Artificial Intelligence and Business Strategy towards Digital Transformation: A Research Agenda", *Sustainability*, Vol. 13, No. 4, pp. 2025-2039.
- Kwak, W., Shi, Y., Lee, F. (2021), "Data Mining Applications in Accounting and Finance Context", *In handbook of financial econometrics, mathematics, statistics, and machine learning*, Vol. 1, No. 3, pp. 823-857.
- Kerzel, U. (2021), "Enterprise AI Canvas Integrating Artificial Intelligence into Business", *Applied Artificial Intelligence*, Vol. 35, No. 1, pp. 1-12.
- Lin, S.J. (2021), "Integrated artificial intelligence and visualization technique for enhanced management decision in today's turbulent business environments", *Cybernetics and Systems*, Vol. 52, No. 4, pp.274-292.
- Luo, J., Meng, Q., Cai, Y. (2018), "Analysis of the Impact of Artificial Intelligence application on the Development of Accounting Industry", *Open Journal of Business and Management*, Vol. 6, No. 4, pp. 850-856.
- Oh, H., Ko, D. (2018), "Effects Characteristic of Accounting Information System Cause on Accounting Information System Performance", *Journal of Industrial Economics and Business*, Vol. 31, No. 5, pp. 1673-1691.
- Oláh, J. et al. (2019), "Achieving sustainable e-commerce in environmental, social and economic dimensions by taking possible trade-offs", *Sustainability*, Vol. 11, No. 1, pp. 89-111.
- Oláh, J., et al. (2020), "Impact of Industry 4.0 on environmental sustainability", *Sustainability*, Vol. 12, No. 11, pp. 46-74.
- Pakurár, M., Haddad, H., Nagy, J., Popp, J., Oláh, J., (2019), "The impact of supply chain integration and internal control on financial performance in the Jordanian banking sector", *Sustainability*, Vol. 11, No. 5, pp. 1248.
- Palomares, I., et al. (2021), "A panoramic view and swot analysis of artificial intelligence for achieving the sustainable development goals by 2030: progress and prospects", *Applied Intelligence*, Vol. 1, No. 1, pp. 1-31.
- Payne, M., Peltier, J. Barger, V.A. (2021), "Enhancing the value co-creation process: artificial intelligence and mobile banking service platforms", *Journal of Research in Interactive Marketing*, Vol. 15 No. 1, pp. 68-85.
- Poola, I. (2017), "How Artificial Intelligence in Impacting Real Life Every day", *International Journal of Advance Research and Development*, Vol. 2, Issue10, pp. 35-49.
- Shaffer, K., Gaumer, C. Bradley, K. (2020), "Artificial intelligence products reshape accounting: time to re-train", *Development and Learning in Organizations: An International Journal*, Vol. 34, No. 6, pp. 41-43.
- Shukla, S., Vijay, J.F. (2013), "Applicability of Artificial Intelligence in Different Fields of Life, International", *Journal of Scientific Engineering and Research*, Vol. 1, No. 1, pp. 29-39.
- Thapayom, A. (2015), "Accounting information system excellence and goal achievement: evidence from information and communication technology businesses in Thailand", *The Business and Management Review*, Vol. 7, No. 1, pp. 104-119.
- Vlacic, B., Corbo, L., e Silva, S.C., Dabic, M. (2021), "The evolving role of artificial intelligence in marketing: A review and research agenda", *Journal of Business Research*, Vol. 134, No. 5, pp. 187-203.
- Wisna, N. (2018), "Factors affecting the quality of accounting information", *International Journal of Scientific & Technology Research*, Vol. 7, No. 4, pp. 193-197.