



RESEARCH ARTICLE

## The Impact of Technology and Digital Applications on Organizational Performance in Jordanian Commercial Banks

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**ABSTRACT**

This study aims to determine the impact of technology and digital applications on the organizational performance of Jordanian commercial banks". "The descriptive approach was used to suit the nature of the study's objective, as the study population consisted of all employees of the 13 Jordanian commercial banks listed on the Amman Stock Exchange". "An electronic questionnaire was sent to all Jordanian commercial banks listed on the Amman Stock Exchange through the website and email. (246) questionnaires were collected and approved to be filled out by employees of Jordanian commercial banks". "The results of the study showed that there is a positive and statistically significant impact of technology and digital applications in all their dimensions (hardware, software, databases, and communications networks) on organizational performance". "Based on the previous results, the study recommends the need to further develop the technology used at work to achieve a higher transformation rate in providing electronic services to the public". "Commercial banks must benefit from global experiences in the field of organizational performance, which includes financial, human, and practical performance, to improve their organizational performance and achieve a competitive advantage".

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## INTRODUCTION

The modern era is characterized by the acceleration and great development that have occurred in all different fields, as there is hardly a field in which many scientific leaps have not occurred (Whitelaw et al.,2020)" . The most prominent areas of this progress have been reflected through technology and digital applications, which are the most prominent features of the twenty-first century and have had great and positive effects (Almosni et al.,2018). On organizational performance and raising the efficiency of organizations and the banking sector. The introduction of digital technology and applications that affected the banking sector made it one of the most important challenges that

required managers to keep pace with this development by transferring the management of this resource from the traditional style to the modern style, which made it important and a source for gaining and achieving a competitive advantage over the other banking sector, in addition to that (Kisto's et al., 2021). The banking sector that uses digital technology and applications has been mandated to be more required than other organizations to convert their various paper jobs and files into electronic jobs and files (Zacharias's & Oscan, 2017). This encourages management and employees to communicate and establish relationships through internal and external networks as well as the Internet to enhance and develop them and to take the initiative, precision, and caution in their implementation (Ewing et al., 2019). In view of the circumstances and challenges witnessed today, which are represented by the tremendous and rapid development of technology and digital applications, which has forced the banking sector to need to raise the level of organizational performance to complete work as quickly as possible, with high accuracy, and at the lowest cost (Liu et al., 2021) the research problem can be clearly defined in revealing the importance of the impact of technology and digital applications on the organizational performance of Jordanian commercial banks.

## **LITERATURE REVIEW**

### **Technology and " Digital" Applications**

"Digital" technology and applications are defined as electronic tools, systems, devices, and resources that create, store, or process data, as explained by Qi et al. (2021) as follows:

#### **Websites**

"Websites provide all kinds of information and are gradually becoming the best way to communicate with people. Moreover, the Internet is the definition of multiple parts of digital technology, and the website is one of the most popular parts of the Internet that people use greatly nowadays".

#### **Buying and selling online**

The advantage of online shopping is that it develops and provides customers with a variety of choices". "Customers can buy from a different number of retailers from every corner of the world or from any brand". "Online selling can be conducted on a large scale as a large enterprise or just to make a little cash selling individual products.

#### **Smart phones**

"The launch of smart mobile phones has transformed and developed communication systems. Today, there are smartphones that include various other types of digital technologies, such as calculators, cameras, mapping, etc"." Therefore, smartphone applications provide increasing options for customers".

Digital technology and applications also include many important elements, such as graphic analysis, artificial intelligence, virtual reality, and smart applications, as they contribute to improving current systems and creating new solutions (Li, 2019). Moreover, digital technology and applications help provide information in a fast and accurate manner, which increases the effectiveness of decision-making and contributes to business success (Wu, 2021). Despite the benefits of digital technology, it also poses some challenges. These challenges include issues of cybersecurity and personal data protection, as users must take measures and precautions to protect themselves and their information from hacks and cyber threats (Giarnieri & Scardapane, 2023).

**Types of digital technology and applications:****Information technology**

Information technology is considered one of the most important types of digital technology. It includes all systems, hardware, and software that are used to collect, process, and transmit information. Examples include computers, servers, and database management systems (Pagani & Pardo, 2017).

**Communication Technology**

This category includes digital communication systems such as smartphones and the Internet. It contributes to achieving fast and efficient communications between people and devices on a global level (Berg et al., 2017).

**Multimedia technology**

This technology reflects advances in the field of audio and video. Examples include techniques for recording video and audio, editing them, and transmitting them over the Internet. It contributes to the production of the digital content we consume daily (Du et al., 2022).

**Artificial intelligence technology**

Artificial intelligence technology represents a quantum leap in the world of technology. They allow systems and devices to make intelligent decisions based on their data and self-learning. Its impact can be seen in applications such as self-driving cars and intelligent chat servers (Brown et al., 2018).

**Cyber security technology**

With the increase in cyber threats, cyber security technology has become vital. They include security, encryption, and identity verification systems that protect sensitive data and information from hacking (Ma, 2021).

**Block chain technology**

Block chain technology is a system of digital records based on smart contracts and cryptocurrencies. It is considered a secure mechanism for recording transactions and sharing them across a distributed network (Dutta et al., 2020).

**Virtual reality and augmented reality technology**

Virtual reality technology provides interactive, realistic experiences through special devices. While augmented reality technology enables users to see an enhanced digital world interacting with the real world (El Miedany & El Miedany, 2019).

**Robotics technology**

Robotics technology provides devices capable of performing multiple tasks without human intervention. They are used in fields such as industry, medicine, and space exploration (Pagliarini & Lund, 2017).

**"Organizational performance"**

"Performance is considered one of the most important goals that any organization seeks to achieve, as performance contributes directly to the development and increase of services or perhaps to the weakness and deterioration of these services (Novak, 2017)". "Performance can also be considered a measure through which the extent of the ability to continue this activity or work is determined, as is done by During performance, a judgment is given on the extent of proficiency in the work or the extent to which individuals possess a certain skill, information, or idea, and thus the ability to determine the individual's positive or negative role in the management pyramid followed in the

organization (Soelton et al., 2021)" . Organizational performance at the individual, group, and organizational levels is a fundamental goal for organizations, as no organization can survive and continue without judging the effectiveness of individuals, groups, and organizations. The content of the concept of organizational performance varies among banks and organizations depending on their goals, orientations, and managers' understanding of it (George et al.,2019)" . " Serrat (2017) indicated that effective performance comes through studying environmental, technological, and competitive factors, identifying opportunities and threats, drawing alternative strategies, and choosing the alternative that ensures achieving the best benefit and the highest level of performance through three main dimensions of the concept of performance, which are: Financial, operational performance, and organizational effectiveness".

"Successful banks are concerned with knowing the extent to which their performance rates have reached compared to similar competing banks and exploring how their competitors are working to improve their level of performance (Al-Musali & Ku Ismail, 2016)" . "Successful banks use modern methods that contribute to increasing work speed and accuracy and reducing costs through the application of technology (Hashemi et al.,2020)" . "Successful banks are also distinguished by their ability to reformulate old patterns into a modern form and invent new ones. This is due to their ability to combine the talents of their individuals with the experience they have acquired (Brunsson & Olsen, 2018)" . "These banks use organized, conscious processes to improve their level of performance and are concerned with the availability of available talent by using their authority constructively to develop its employees are in situations where they face problems that they must solve, as they must be fully prepared to change their method if necessary (Soud, 2020)" . " It also makes the employees' performance in harmony with the bank's performance, so that the result is raising the level of the bank's performance and achieving its goals". "Employee performance is extremely important. Successful banks know the importance of subjecting this performance to a wise policy, so we find that they deal with performance policy in an organized and conscious manner (Agbaeze et al.,2017)" . " Delegating the authority to make some decisions is beneficial in improving performance because it motivates employees, as after delegating it, the subordinate feels his boss's confidence in him and thus uses all his abilities to play a greater role, which leads to more effective and better performance (Hongal & Kinange, 2020)" .

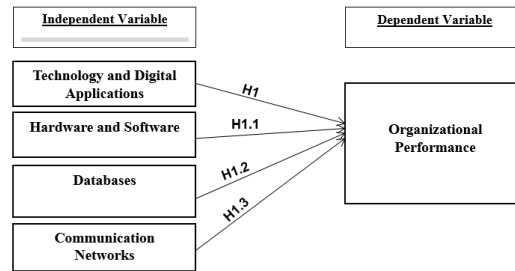
### "Hypothesis development"

#### "Technology and Digital Applications towards Organizational Performance"

"

The results of the study by Al-Khaza'ilah (2017) showed that the fields of information technology have an impact on the performance of employees". "The results showed that the communication network variable had the most influence on employees' performance indicators, then the hardware and software variable, and finally the database variable". " The results of the study by Al-Maayaa and Al-Mahaira (2023) also showed a statistically significant effect at the significance level (0.05) of the application of digital technology in its dimensions (communications and network technology, data management technology, software, and computer equipment) on the performance of employees in the Jordanian General Organization for Social Security". " The following hypotheses can be formed in light of the foregoing":

**H1: " There is a statistically significant effect at the level ( $\alpha \geq 0.05$ ) concerning the of technology and digital applications on the organizational performance of Jordanian commercial banks".**



Study model: Source (Al-Khaza'ilah, 2017; Al-Maayaa and Al-Mahaira,2023).

### Hardware and Software towards Organizational Performance

Software is defined as a set of commands and instructions that instruct a computer how to do its job (Patterson & Hennessy, 2016)." The results of the study" by Al-Mamary et al. (2014) showed a positive relationship between system quality, information quality, and organizational performance. The results of the study, also by Jarah et al. (2023), showed that communications technology networks have a statistically significant impact on the growth of the performance of the improved AIS system for Jordanian banks. The following hypotheses can be formed in light of the foregoing:

**H1.1:" There is a statistically significant effect at the level ( $\alpha \geq 0.05$ ) concerning the Hardware and Software on the organizational performance of Jordanian commercial banks".**

### "Databases towards Organizational Performance"

"Databases are the process through which all resources related to information technology are managed according to the priorities and needs of the organization"." This includes tangible resources such as network devices, computers, and people, as well as intangible resources such as software and data (Ewah, 2019)" ." The main goal of databases is to generate value through the use of technology". "The study by Lee et al. (2022) showed a statistically significant effect between databases and organizational performance in Malaysia". "The results of the study by Tsou and Chen (2023) also showed a positive, statistically significant effect between databases and organizational performance"." The following hypotheses can be formed in light of the foregoing":

**H1.2: "There is a statistically significant effect at the level ( $\alpha \geq 0.05$ ) concerning the Databases on the organizational performance of Jordanian commercial banks".**

### Communication Networks towards Organizational Performance

Communication networks is an expansive and comprehensive term for information technology that emphasizes the role of communications such as telephone lines, wireless signals, and computers, in addition to enterprise software and the necessary middleware that enable users to access, store, transmit, and process information Zhou et al., (2018). The study by Adam (2016) showed a statistically significant effect between communication networks and organizational performance." The results of the study by Jordão et al. (2020) also showed a positive, statistically significant effect between communication networks and organizational performance". "The following hypotheses can be formed in light of the foregoing":

**H1.3: "There is a statistically significant effect at the level ( $\alpha \geq 0.05$ ) concerning the Communication Networks on the organizational performance of Jordanian commercial banks".**

## RESEARCH METHODOLOGY

"A descriptive and analytical method was used in the study. It involves collecting data to test the hypotheses and answer the study questions related to the current status of the study situation". "The

analytical descriptive study is concerned with the evaluation of a population study". It includes attitudes, opinions, demographic information, conditions, and procedures". The descriptive study tries to explain certain characteristics of the phenomenon, while for the hypothesis testing phase, the study investigates if the supposition impact has been proven or not". "Generating further knowledge, methods of problem solving, and understanding phenomena of interest (Sekaran and Bougie, 2019)". "The questionnaire was designed to collect and analyze data to obtain the information required in this study for an experimental purpose". "The statistical package for the social sciences (SPSS) version 26 was used to analyze the primary data and provide descriptive analysis about the data collection from the sample, such as means, standard deviations, and frequencies". "also, to investigate hypotheses Reliability was also verified using both internal consistency measures and Cronbach's alpha. Validity was also evaluated".

### "The Study Population and Sample"

"The target population of this research consists of all employees of the (13) Jordanian commercial banks listed on the Amman Stock Exchange, as commercial banks seek to achieve excellence and keep pace with global changes in the field of technology, which reflects positively on the organizational performance in commercial banks". "The size of the target population is relatively large, which makes it difficult to reach all people and the time available for collecting data is limited". "This led to the use of convenience sampling. To achieve the goal of this study, an electronic questionnaire was sent to all Jordanian commercial banks listed on the Amman Stock Exchange through the website and e-mail. The researcher was able to collect (246) questionnaires that were approved to be filled out by employees of Jordanian commercial banks".

"The prevailing characteristics of the study sample members who work in Jordanian commercial banks were that most of them were middle-aged males and had moderate experience in their current field of work. The majority of participants also had bachelor's degrees".

### "Data Collection "

"Two different sources were used to acquire the information needed to complete the study's objectives. The use of secondary sources began with the use of theoretical and scientific literature". "These sources played a crucial role in helping researchers gather the information they needed to build the study's theoretical framework, refine its goals, and review key findings". Additionally, they were extremely important in developing the study's hypotheses and enhancing the conversation. Books, university theses, scholarly research articles, peer-reviewed magazines, and academic works published in both Arabic and English comprised the secondary sources".

### "Reliability Test"

"To ensure that the questionnaire's items were adequate and consistent, the Cronbach's Alpha value was determined". "The value is statistically acceptable if the result is more than 0.70, and the closer it is to one (or 100%), the more reliable the search tool will be (Sekaran and Bougie, 2016)". "Cronbach Alpha ranges from 0.890 to 0.944, as seen in Table (1). To put it another way, the study tool is reliable, and the data it generates is accurate and trustworthy for assessing variables". "Since all independent and validated variable dimensions are greater than 70%, reliability has been taken into account".

**"Table (1): Cronbach's Alpha Coefficient"**

	"Number of items"	"alpha Cronbach"
Hardware and Software	5	0.944
Databases	4	0.912
Communication Networks	4	0.924

Technology and Digital Applications	13	0.893
Organizational Performance	10	0.908
Total	<b>23</b>	0.890

### Descriptive Statistical Analysis

"The mean of **Technology and Digital Applications** is **3.690**, According to Table (2), the mean for the variable "**Hardware and software**" was calculated to be 3.806". "This indicates a high level of agreement among the respondents regarding this variable". "When examining the answers to the individual items, the paragraph that states "The bank uses some ready-made software to perform its work" appears in first place, with a mean of (4.077) and high relative importance". On the other hand, the paragraph that states, "The bank seeks to carry out its business through computerized information technologies," ranked last with a mean of (3.524) and medium relative importance.

"The mean for the variable " Databases " was calculated to be 3.482"." This indicates a medium level of agreement among the respondents regarding this variable". "Upon examining the individual item responses, it is evident that "The data can be accessed at the appropriate time by bank employees", received the highest average rating of 3.613". "On the other hand, the paragraph "The bank is keen to select useful data from useless data before processing it", has a lower average rating of 3.394". "and all paragraphs are of medium importance in the sample of the study".

"The mean for the variable " Communication Networks " was calculated to be 3.783". "This indicates a high level of agreement among the respondents regarding this variable"." Upon examining the individual item responses, the paragraph "The bank uses communication networks to connect all important departments in the organization", received the highest average rating of 3.955". "On the other hand, the Paragraph "The exchange of data and information takes place easily between the departments in the bank through the means of communication available to them.", which a lower average rating of 3.593".

**Table (2): Descriptive Statistics mean and standard deviation of Technology and Digital Applications Dimensions"**

NO.	"Items"	"Mean"	"SD"	"Rank"	"Importance"
1	There are sufficient numbers of computers in the bank	3.983	0.750	2	High
2	The bank uses some ready-made software to perform its work	4.077	0.776	1	High
3	The bank uses high-tech devices	3.536	1.083	4	Medium
4	The bank seeks to carry out its business through computerized information technologies	3.524	1.091	5	Medium
5	The bank has devices and equipment that enable it to be a leader in its work	3.910	0.848	3	High
	Hardware and software	3.806	0.633		High
1	The data can be accessed at the appropriate time by bank employees	3.613	0.922	1	Medium
2	Accuracy is available in retrieving data and information	3.451	0.878	3	Medium
3	The data is constantly reviewed and updated	3.471	0.893	2	Medium
4	The bank is keen to select useful data from useless data before processing it	3.394	0.958	4	Medium
	Databases	3.482	0.686		Medium
1	The bank uses communication networks to connect all important departments in the organization	3.955	0.789	1	High

2	"The exchange of data and information takes place easily between the departments in the bank through the means of communication available to them".	3.593	0.879	4	Medium
3	"The bank is keen to provide network security for the purpose of protecting information and data and maintaining their confidentiality"	3.829	0.765	2	High
4	"The bank's computerized digital applications technology department is distinguished by its ability to implement its programs and plans with high efficiency"	3.776	0.810	3	High
	<b>Communication Networks</b>	<b>3.783</b>	0.593		"High"
	<b>Green Performance Appraisal</b>	<b>3.690</b>	0.510		"High"

According to Table (3), the mean for the variable " Organizational performance " was calculated to be 3.759". "This indicates a high level of agreement among the respondents regarding this variable. Upon examining the individual item responses, it is evident that "Sales volume increased and customer demand for the bank's banking products increased compared to previous years", received the highest average rating of 3.844". "On the other hand, the Paragraph "Job satisfaction levels among bank employees have increased compared to previous years", which a lower average rating of 3.560".

**"Table (3): Descriptive Statistics mean and standard deviation of the Organizational performance"**

NO.	" Items"	"Mean"	"SD"	"Rank"	"Importance"
1	The bank's competitive advantage has increased compared to previous years, making it occupy an advanced position among other Jordanian banks.	3.829	0.835	5	High
2	The bank's profitability increased, accompanied by a decrease in overhead expenses, compared to previous years.	3.829	0.859	4	High
3	Sales volume increased and customer demand for the bank's banking products increased compared to previous years.	3.849	0.851	1	High
4	The bank's reach increased and its market share increased compared to previous years.	3.841	0.830	2	High
5	The bank has enjoyed a good and prestigious reputation and high customer appreciation compared to previous years.	3.691	0.974	7	High
6	Job satisfaction levels among bank employees have increased compared to previous years.	3.560	1.035	10	Medium
7	The bank's employee turnover rate has decreased, and their sense of job stability has increased compared to previous years.	3.678	0.955	8	Medium
8	The level of employee absenteeism at the bank has decreased compared to previous years.	3.817	0.936	6	High
9	Employees' knowledge of the bank's policies and procedures has increased. And their participation in administrative affairs compared to previous years.	3.833	0.838	3	High
10	The bank's customers' satisfaction with banking services and employee performance has increased compared to previous years.	3.662	0.958	9	Medium
	<b>Organizational performance</b>	<b>3.759</b>	0.631		High



**The First Main Hypothesis**

To test the first main hypothesis, Multi linear regression analysis was performed.

**The first main hypothesis of the study was as follows:** "There is a statistically significant impact at the level of ( $\alpha \leq 0.05$ ) concerning the of technology and digital applications on the organizational performance of Jordanian commercial banks".

**"Table (4): Results of Testing the Impact main hypothesis"**

"D.V"	"Model Summery"		"ANOVA"		"Coefficients"				
	"R"	"R <sup>2</sup> "	"F"	"Sig F*"	"variable"	"B"	"standard error"	"T"	"Sig T*"
Organizational performance	0.773	0.598	120.138	0.000	Hardware and software	0.230	0.045	5.084	0.000
					Databases	0.357	0.052	6.823	0.000
					Communication Networks	0.350	0.057	6.186	0.000

\*The effect is statistically significant at the level ( $\alpha \leq 0.05$ )

The correlation coefficient (R = 0.773) shows that Technology and Digital Applications has an impact on Jordanian commercial banks methods for promoting Organizational performance. Table No. (4) shows that the effect of the independent variable (Technology and Digital Applications) on promoting Organizational performance is statistically significant, with a calculated value of F (120.138) and a level of significance (sig = 0.000) less than 0.05". The coefficient of determination (R<sup>2</sup> = 0.589) shows that variation in quantitative methods can account for 59.8% of the variation in (Organizational performance)".

"The values of the regression coefficients for the variable's sub-dimensions (Technology and Digital Applications) are displayed in Table (4)". The table makes it evident that the Hardware and software dimension's B value was (0.230) and that its computed T value was (5.084) at a significant level (0.000)". It is less than 0.05, meaning that at the significance level ( $\alpha \leq 0.05$ ), there is a substantial positive effect. The table clearly shows that the value of T was calculated in this dimension (6.823) at a significance level (0.000), that is, less than 0.05, indicating a substantial positive effect at ( $\alpha \leq 0.05$ )". The value of B in the Databases dimension was (0.357). The table makes it evident that there was a substantial positive influence in the Communication Networks dimension, with the B value being 0.350 and the T value being 6.186 at a significance level of (0.000), less than 0.05. where ( $\alpha \leq 0.05$ )".

**To test the sub-hypotheses, simple linear regression analysis was performed.**

H1.1: "There is a statistically significant effect at the level ( $\alpha \leq 0.05$ ) concerning the Hardware and Software on the organizational performance of Jordanian commercial banks".

H1.2: "There is a statistically significant effect at the level ( $\alpha \leq 0.05$ ) concerning the Databases on the organizational performance of Jordanian commercial banks".

H1.3: "There is a statistically significant effect at the level ( $\alpha \leq 0.05$ ) concerning the Communication Networks on the organizational performance of Jordanian commercial banks".

**"Table (5): Impact test results H1.1, H1.2 and H1.3"**

"D.V"	"Model Summery"		"ANOVA"		"Coefficients"			
	"R"	"R <sup>2</sup> "	"F"	"Sig F*"	"B"	"standard error"	"T"	"Sig T*"
Hardware and software	0.495	0.245	79.143	0.000	0.493	0.055	8.896	0.000
Databases	0.702	0.493	237.000	0.000	0.645	0.042	15.395	0.000
Communication Networks	0.643	0.413	171.601	0.000	0.684	0.052	13.100	0.000

\*The effect is statistically significant at the level ( $\alpha \leq 0.05$ )

"A positive association was found between the first dimension (Hardware and software) and the second dimension (Organizational performance), as indicated by Table 5's R-value of (0.495)" . "When all other factors stay constant, the coefficient of determination results show that ( $R^2 = 0.245$ ), which indicates that, when it comes to Organizational performance, the (Hardware and software) domain accounted (24.5%) of the variation". "At the significance level ( $\alpha \leq 0.05$ ), it was demonstrated that the regression's significance was supported by the value of (F) reaching 79.143 at the confidence level (sig = 0.000)" .

"There is a positive association between the two dimensions (Databases and Organizational performance), as indicated by the second dimension's R-value of 0.702". "After adjusting for all other factors, the coefficient of determination results in ( $R^2 = 0.493$ ), which indicates that the (Databases) domain accounted for (49.3%) of the variance in (Organizational performance)" . "Furthermore, the value of (F) reached (237.000) at the level of confidence (sig = 0.000), demonstrating the significance of the regression at the level of significance ( $\alpha \leq 0.05$ ), was demonstrated".

"There is a positive link between the third dimension (Organizational performance) and the dimension (Communication Networks), as indicated by the R-value of 0.643". "Assuming all other variables stay constant, the coefficient of determination results show that the (Communication Networks) domain accounted for 41.3% of the variance in (Organizational performance). This is equivalent to a coefficient of determination of 0.413". "The value of (F) achieved (171.601) at the level of confidence (sig = 0.000), demonstrating the significance of the regression at the  $\alpha < 0.05$  significance level, was also demonstrated".

## **"RESULTS AND RECOMMENDATIONS"**

"In light of the results of the study analysis, the results can be summarized as follows":

"There is a statistically significant impact at the concerning the of technology and digital applications on the organizational performance of Jordanian commercial banks. The correlation coefficient ( $R = 0.773$ ) shows that Technology and Digital Applications has an impact on Jordanian commercial banks methods for promoting Organizational performance".

"There is a statistically significant effect at the concerning the Hardware and Software on the organizational performance of Jordanian commercial banks".

" There is a statistically significant effect at the concerning the Databases on the organizational performance of Jordanian commercial banks".

"There is a statistically significant effect at the concerning the Communication Networks on the organizational performance of Jordanian commercial banks".

## "Recommendations"

"In light of the previous findings of the study, the study proposes a set of recommendations summarized in the following points":

Increase the development of technology used in work in order to achieve a higher rate of transformation in providing electronic services to the public.

Commercial banks should benefit from international experiences in the field of organizational performance, which includes financial, human, and practical performance, to improve their organizational performance.

"Encouraging research and development departments in Jordanian commercial banks to acquire new knowledge and technologies that contribute to raising the banks' performance and giving them a competitive advantage".

Conducting more research and studies that address the impact of technology and digital applications on organizational performance in terms of providing hardware and software and the use of databases and communications networks, which help improve the quality of banking services provided to the community and which achieve a competitive advantage, and other factors affecting the organizational performance of banks.

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