

The Impact of Cloud Computing on the Protection of Electronic Financial Application Programs in Jordanian Commercial Banks

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Abstract

The current study aimed to find out the impact of cloud computing on the protection of financial application programs in the commercial banking sector, and the study population was represented by Jordanian commercial banks, and reports showed the existence of (13) commercial banks. The study population was limited to a category (branch manager, head of department, head of division and administrative) of employees in Jordanian commercial banks, the northern region where the researcher distributed the questionnaire in the branches of the Northern Region, (356) respondents from the workers were distributed to them. The results of the statistical analysis showed the existence of the impact of cloud computing on the protection of electronic financial application programs in Jordanian commercial banks, and this effect is considered statistically significant, and the results showed that commercial banks are based on the application of cloud computing in their activities through financial programs.

Keywords: Cloud Computing - Electronic Financial Application Programs - Jordanian Commercial Banks.

1.Introduction :

The rapid development of communication technology is highlighting trends among many organizations to make their applications available for use through the Internet, activities known as cloud computing. It is a model for accessing the shared technical resources of these companies, through Internet outlets, with minimal administrative effort or interaction by service providers.

Cloud computing technologies are a great support for financial companies in general and commercial banks in particular in obtaining strong and efficient resources that they could not afford, and provide an opportunity for these large banks to obtain a large space of processors, storage capacities and large communication servers whenever they need without resource restrictions or having to increase the size of their potential equipment to achieve many financial and administrative advantages (Zaker and Sakka, 2020).

It has introduced a new model that reduces the complexity of information technology by promoting the efficient assembly of a self-organized virtual infrastructure on demand, where cloud computing uses the Internet to share computing resources such as data storage and processing. It provide access to applications, data and services from anywhere and on any device, thus providing many features such as accessing and processing information from anywhere via the Internet, resource configuration, subscription options, and self-service features.

Problem of the study :

Banks compete among themselves to acquire the knowledge of their employees and obtain the best and latest technologies in order to support databases in those banks, especially in the activity of (data collection, tabulation, updating and recalling in a timely manner), and despite the prevalence of cloud computing applications and services, and the expansion of their areas of use, there is a lack of standards for their services and applications, which resulted in a number of problems and challenges that reduced the importance of cloud computing and limited the investment of its features and advantages, as it was represented by protecting Data, communication, and response time. As the banking sector depends on these elements in its financial operations, and the issue of data ownership is the main concern for the management of these banks, as the privacy and protection of these data is an essential pillar in the survival of computerized operations within the protection standards. The problem of the study can be formulated in the following main question:

What is the impact of cloud computing on the protection of electronic financial application programs in Jordanian commercial banks?

Objectives of the study :

This study aims to identify the level of application of cloud computing technology in Jordanian banks. The impact of cloud computation on the protection of electronic financial application programs in Jordanian commercial banks. Detection of the level of risk by criteria (user access, data security, data storage).

Importance of the study:

The importance of the study is evident through two aspects: theoretical importance and practical importance, represented in the following:

Theoretical importance:

The importance of this study was evident by highlighting the issue of the impact of cloud computing on the protection of electronic financial application programs in Jordanian commercial banks, and the current study is one of the few local studies according to the researcher's knowledge, which looks to reveal the relationship between cloud computing and the protection of electronic financial application programs. This highlights the importance of conducting this study, and therefore it is related to the protection of electronic financial applications in Jordanian commercial banks.

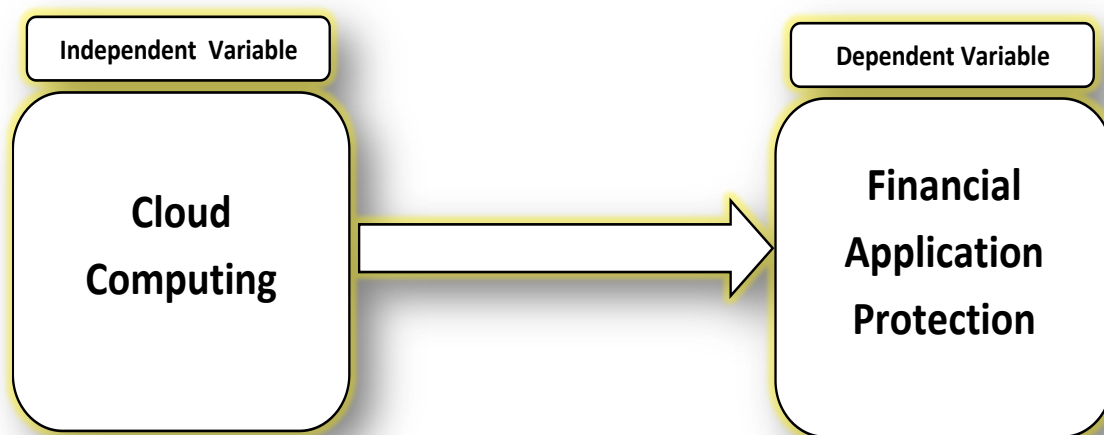
Practical importance:

The importance of the practical study stems from the desired results and through the feedback provided by the study on the impact of cloud computing on the protection of electronic financial application programs in Jordanian commercial banks, as these results may help decision makers in Jordanian commercial banks to develop frameworks, plans and programs supporting data protection and performance improvement.

Study hypotheses:

The following hypotheses were built, depending on the study problem, and its questions to achieve the desired study objectives, namely: The first main hypothesis: There is no statistically significant effect at the significance level $(0.05) > (\alpha$ for cloud computing on the protection of electronic financial application programs in Jordanian commercial banks.

Study Model: Based on the formulation of the study questions, the following model was built .



(Al-Fifi , 2022) , (Al-Mutairi, 2018) , (Salmi , 2016)

Study Terminology:**Cloud computing:**

It is the method by which the application software is operated, and the data related to it is stored in mainframe computer systems, while providing customers or users access to it via the Internet (Massaid, 2019).

Electronic financial applications:

Electronic banking programs and operations carried out by banks using electronic communication networks, so that they save the customer the trouble of coming to the bank, as they are the technologies used by banks by adopting technological means related to the work of commercial banks in Jordan (Al-Adwan, 2015).

2.Theoretical framework and previous studies:**Introduction:**

Cloud computing is a modern type of technical development that includes infrastructure components, cloud host, software provision, and providing services to users, and cloud computing systems software is one of the most prominent controversial issues in the business world, because of the solutions and challenges it poses at the same time.

The concept of cloud computing:

Cloud computing expresses services that are carried out through devices and software connected to a network of servers that carry their data in a virtual cloud that ensures their connection permanently and at all times without interruption, with different devices and all ports, by granting permissions to users from both parties.

The National Institute of Standards and Technology (NIST) has defined cloud computing as a common set of configured computing resources such as networks, servers, and storage, and can be provided and launched quickly and with minimal administrative effort or interaction with the service provider (Al-Mutairi, 2018). In writing Cloud Computing, Salmi (2016) defined it as the computing pattern through which flexible, scaled capabilities powered by the power of information technology are offered as a service delivered over public networks, including the Internet. Cloud computing is a technology that allows those interested in programming to store the information they program on the Internet, instead of putting it on their own computers, so that it is not exposed to viruses, or other damage, according to computer experts.

Cloud computing is a model of technical software used to manage the consumption of information sources and services, and it provides an incentive to develop technologies, reduce the cost of managing information technology affairs for organizations, and make the business field more flexible and dynamic. Sayed defined it as a technology adopted in the transfer and processing of computer storage space to the so-called cloud, which is a server that we can access via the Internet and thus transform IT programs from products to services (Sayed, 2013).

Cloud computing features:

Providing infrastructure as a service: The cloud saves the trouble of creating infrastructure and providing huge servers to accommodate the volume of stored information and the amount of orders executed every second, and also allows hosting websites on virtual servers by collecting them from the connection of thousands of devices and servers together within one network, and this is what is known as computing card, and to provide better service and more diverse experiences (Zaker& AlSakka, 2020).

Software as a Service: A model of software governance in which iOS hosts client applications on its site. This feature enables information sharing between network users and live storage on the cloud when connected to the Internet and applications can be accessed from various client devices either through a thin client interface, such as a web browser (e.g. web email), or a software interface. Instead of paying for the maintenance of their computing infrastructure, the customer participates in the service and the cloud-hosted website benefits from the duplication of a large number of physical server network and scalability, meaning that organizations using cloud computing do not need to add hardware and software with higher standards and efficiencies when increasing the number of users (Jaradat, 2020).

- The impact of cloud computing on the effectiveness of accounting information systems:
- Cloud computing, with its applications and software, contributes to playing a major and effective role, with regard to accounting information systems, as it is characterized by advanced characteristics in terms of efficiency, speed and accuracy in completing tasks, and commercial banks have become considered as a data bank and represent an important pillar and an essential manifestation of the scientific revolution, which is indispensable for all users inside and outside the accounting unit. Zaker and Sakka (2020) mentioned the implications of cloud computing performance on accounting information systems as follows:
- Taking advantage of the services provided by software companies in the fields of cloud storage and cloud computing can contribute to achieving the qualitative characteristics of accounting information.
- Cloud computing contributes to keeping pace with developments in the information technology environment and trying to benefit from them in a way that contributes to achieving the efficiency and effectiveness of accounting information systems.
- The ability to train and develop the technical capabilities of accountants and work to facilitate their atypical and traditional operations related to the analysis and design of accounting systems. - Reducing the costs of infrastructure in owning, maintaining and modernizing them, in a way that contributes to reducing the cost of producing information in general.

Financial and data protection axes:

Data security:

It is intended to ensure that unauthorized persons do not see the information, and that no change or distortion is made to ensure that the information is correct, accurate and complete during its storage or transmission. To achieve this goal, the organization must use appropriate protection methods through the use of multiple means such as: encryption of messages, and not to recognize the volume or path of information (Abu Kamil, 2016).

Data storage:

It means ensuring that what is contained in the information is correct and that it cannot be modified, destroyed or tampered with at any stage of processing or exchange, whether dealing internally in the organization or externally by unauthorized persons, and this often happens due to illegal intrusions such as: viruses so that no one can break the database and change his account balance, so it is his responsibility to follow appropriate means of protection (Masoud and Zain, 2019).

User access:

The employees of the economic unit are the main source of internal risks to which the electronic accounting information systems are exposed, because the employees of the facility are aware and familiar with the system information and more familiar than others with the control system applied to the facility(Al Bassyouni,2021).

Previous Studies:**Studies in Arabic and English:**

Al-Fifi (2022) :This study aimed to identify the reality of cloud computing technology among telecommunications companies in the Kingdom of Saudi Arabia, and the researcher followed the descriptive approach, using the survey method, and the questionnaire study tool, and a random sample of (250) people was selected from the decision makers to adopt computational computing technology. The most prominent results of the study were: The study members strongly agree that the reality of using cloud computing technology among Saudi telecommunications companies is evident through the fact that this technology is an important technical option for them. It is an important factor in providing solutions to counter hacking attacks and enhance security to ensure the needs of users of cloud computing.

Abdul Rasoul (2021) : The study aimed to identify the concept of cloud accounting and the role played in data management for accounting information systems through easy access to accounting and administrative data required for any level of administrative levels and according to the powers granted to them. The researcher relied on the descriptive analytical approach, and the researcher designed a cloud accounting program and extracted results. The results of the study showed that the expansion of the work of companies, which has become transcontinental, where traditional accounting and based on ready-made accounting programs do not meet the purpose required of them effectively and quickly. Cloud accounting reduces transmission and writing errors because operations from constraints to financial results are automated .

Al-Ghazzawi Study (2020). The study aimed to identify the modified impact of cloud computing on the relationship between the application of e-government and the quality of government services in the Jordanian public sector, and the aim of the study was to develop a questionnaire based on previous research and distributed to an intentional meaning that included a number of workers, especially information technology employees in Jordanian ministries and government departments that apply e-government effectively and significantly and added to the cloud computing platform. (300) questionnaires were distributed to the sample, and among the most prominent results of the study are : There is a statistically significant positive impact of e-government on improving the delivery of government services in the Jordanian public sector. There is a small positive impact that is not statistically significant for the modified role of cloud computing on the relationship between the application of e-government and improving the delivery of e-government services in the Jordanian public sector.

Zaker and Sakka (2020) : The study aimed to provide a theoretical framework that tests the correlation and impact relationship between cloud computing and the efficiency of accounting information systems, and the researcher followed the descriptive approach to build the study. The study tool was adopted a questionnaire to collect information, and the study sample represents academics and professionals in a number of Iraqi governorates, where (205) were distributed. The most prominent results were: The existence of an impact between cloud computing and the efficiency of accounting information systems, and it was clear through the results that access to accounts is available in various parts of the country. From any means of communication, cloud accounting applications can be used under annual or monthly payments, and this is what distinguishes them from regular accounting programs, which need large financial payments.

Massaid (2019): The study aimed to determine the extent to which industrial enterprises in Jordan trust the application of cloud computing where this crisis is divided into three different categories: a crisis of confidence in programs and operations, a crisis of confidence in service providers and a crisis of confidence in the security and protection provided by service providers. The descriptive approach was relied on and the questionnaire was distributed to (81) industrial companies in Irbid through a random sample of (120) respondents from employees. The most prominent results were that there is already a crisis of confidence in the application of cloud computing in Jordanian industrial institutions within the fields of operations and programs.

Osdogan, (2017): The study aimed to measure the application of cloud computing in startups and its effects on the accounting profession. The study followed the descriptive analytical approach, and the study tool was interviews in collecting information, and one of the most prominent conclusions were that the increase in the number of startups, as well as accountants, professionals and businessmen with experience in the field of information technology adopted contributed to the demand for cloud computing systems, and that future and cloud-based initiatives will shape the future of this profession.

Devaraju & Woozeer (2015) :The study aimed to investigate the impact of cloud technology on security and privacy on people who use cloud technology, and the researcher has followed the descriptive approach in building the theoretical framework to search for the most important challenges facing the use of those storage clouds, and the problem has been researched from the perspective of cloud architecture, cloud storage perspective, cloud technology user privacy perspective and cloud services. The most prominent conclusions were that there is a list of major cloud security issues that display user privacy. There are several useful lists for cloud computing users related to data storage that users must activate, and they must also fix detected security vulnerabilities.

Xiang Hong et al (2015): It aimed to address the most important challenges, features and security risks facing cloud computing technology, as privacy and information security constitute the greatest threat to this. The researchers used the method of reviewing methodological materials to analyze the available materials and topics on the security problems of cloud computing, and answer some of the questions that have been developed. The most prominent conclusions were the need to face new security challenges and risks in the future, and users and service providers must to be more aware of the risks through the review where it was found that there is a lack of that aspect by users and to have the ability to face the upcoming future challenges of ways to deal with these clouds.

3. Study Methodology:

The researcher used the descriptive analytical approach, which depends on studying the phenomenon as it is in reality and describing it accurately, then analyzing the correlation relationships that exist between the independent variable cloud computing, and the dependent variable, which was represented in the protection of electronic financial application programs in Jordanian commercial banks in an attempt to identify the impact of the independent variable on the dependent variable, in order to reach conclusions that contribute to the development and improvement of reality.

The study population and the study sample :

The study population consisted of Jordanian commercial banks, where the report of the Association of Jordanian Banks for the year 2022 was consulted, and the reports showed the presence of (13) commercial banks. The study population was limited to the category of (branch manager, head of department, head of division and administrative) of employees in Jordanian commercial banks, the northern region where the researcher distributed the questionnaire to them in the branches of the Northern Region, and the questionnaire was distributed to (356) respondents from the employees of Jordanian commercial banks through the use of Google Form and a recovery rate of 100%.

Table (1) Number of Commercial Banks Employees in Jordan

Bank	Total employees in all branches
The Arabic Bank	3844
The Housing Bank for Trade and Financing	2859
The Cairo- Amman Bank	2234
The Jordan Bank	1497
The Kewait Jordan Bank	1407
The Union Bank	1259
The National Jordan Bank	1084
The Investment Arabian Jordan Bank	774
The Commercial Jordan Bank	704
The Capital bank	888
The ABC Bank	509
The Investment Bank	433
The Societe General Bank	313
Total	17,805

Personal characteristics of the members of the study population:

To analyze the results of the study, the researcher reviews the demographic characteristics of the analysis of the results of the study through a detailed description of the characteristics of the study sample based on their answers to the questions contained in the questionnaire within the personal and public data section, as follows:

Table (2) Name of the banks

V Variable	Bank	F Frequency	Percentage
Bank	The Housing Bank	77	21.6%
	The Arabic Bank	23	6.5%
	The Cairo- Amman Bank	25	7.0%
	The Jordan Bank	68	19.1%
	The Kewait Jordan Bank	35	9.8%
	The Union Bank	31	8.7%
	The National Jordan Bank	26	7.3%
	The Arabic Investment Bank	19	5.3%
	The Commercial Jordan Bank	42	11.8%
	The Investment Bank	5	1.4%
	The ABC Bank	5	1.4%
	Total		356

Table (2) shows that the largest percentage was for the Housing Bank category by 21.6% and the lowest percentage was for the Investment Bank and ABC Bank category respectively by 1.4%.

Table (3) Personal and Employment Data of Study Sample Members

N Variable	Type	Frequency	Percentage
Gender	Male	233	65.4%
	Female	123	34.6%
	Total	356	100%
Age	Under 24 years	9	2.5%
	24- under 32	173	48.6%
	32- under 40	145	40.7%
	More than 40	29	8.1%
	Total	356	100%
Years of experience in the bank	Under 5 years	88	24.7%
	5-10	183	51.4%
	10 and more	85	23.9%
	Total	356	100%
The Job Rank	Manager of the branch	15	4.2%
	Head of Department	64	18.0%
	Assistant of head of department	53	14.9%
	Managerial	224	62.9%
	Total		356

The results of Table (3) indicate that the largest majority of the sample was for the male category, which amounted to 65.4%, while the lowest percentage was for the female sample, which amounted to 34.6%. As for the age group, the results of Table (3) indicate that the majority of the members of society are from the age group of 24 less than 32 years by 48.6%, followed by the age group 32 years less than 40 years by 19.3%, followed by the age group 35 years and over by 13.7%, and the last group was less than 25 years by 40.7%. As for the category of years of

experience in the current bank, the results of Table No. (4-2) indicate that the majority of community members are from the category of (5-10) years, which amounted to 51.4%, and the lowest percentage was for the category of 10 years or more, which amounted to 23.9%. The results of Table No. (4-2) indicate that the majority of community members are from the administrative category, which amounted to 62.9%, and the lowest percentage was for the category of branch manager, which amounted to 4.2% .

Hypothesis Test Results:

Simple Regression Results H01: No Statistically Significant Effect at Significance Level (0.05)> (α for Cloud Computing on the Protection of Electronic Financial Application Programs in Jordanian Commercial Banks Table (4) Value of Determination Coefficient and Multiple Correlation Coefficient

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.746	.556	. 555	.43452

Prepared by the researcher based on the results of SPSS

Table No. (5) Calculated F Value and Significance Level ANOVA

Sum of Squares	Free Degree	Mean Square	Significance Level Sig	F
83.760	1	83.760	.000	443.626
66.838	354	.189		
150.597	355			

Table (6) Simple Regression Results

Beta	Sig.	t	Std. Error	B	
	.000	12.061	.116	1.404	(Constant)
.746	.000	21.062	.030	.629	Originality

The main hypothesis was tested at the level of significance ($\alpha \leq 0.05$) and the results were as follows: The level of significance of the test was compared with the level of significance adopted by the study, to show the existence of a significant statistical effect on the dependent variable, and Table (5) shows the values of f where it was $f = 443.626$ and with a significance level of f reached (0.000), which is less than the level of significance (0.05), and therefore we reject the main nihilistic hypothesis and accept the alternative hypothesis, which states that "": There is a statistically significant effect at the significance level (0.05)> (α of cloud computing on the protection of electronic financial application programs in Jordanian commercial banks ."From my table in the summary of the results, it is clear that the value of R, which indicates the correlation between the independent variable and the function, which indicates in Table No. (5) the existence of a positive correlation between the independent variables and the dependent variable, shows that the value of the correlation coefficient = 0.746, which indicates a strong positive correlation between the independent variable and the coefficient of determination R² reached (0.556) and represents the value of It indicates the explanatory ability of the independent variable combined from the dependent variable (Application Software Protection Finance), which indicates that the independent variable explains (55.6%) of the protection of financial application programs. The value of the constant B is (1.404) and is necessary to construct the regression equation for variables.

4. Discussion of findings and recommendations:

Discussion of findings

There is a statistically significant effect at the significance level (0.05)> (α for cloud computing on the protection of electronic financial application programs in Jordanian commercial banks. The results of the statistical analysis showed the existence of an impact of cloud computing on the protection of electronic financial application programs in Jordanian commercial banks, and this effect is statistically significant. Demonstrating the potential and positive impact of cloud computing between the two variables, which is described as powerful, This indicates that the more cloud computing is applied, the higher the protection of financial application programs in commercial banks. The cloud computing variable has an explanatory power of (55.6%), which is an indication that 55.6% protect electronic financial application programs, and to identify the predictive power of the equation, the value of B was relied upon, which represents the extent of the expected change on the dependent variable in the event of a change on the independent variable.

The table shows that the value of B was (0.629), and it is inferred that changing one unit of cloud computing will reflect positively on the protection of financial programs with a value of (0.629).

The study agreed with the study (Abu Rumman, 2021) that there is an impact of the use of cloud computing on improving the performance of the information system in Jordanian private companies, and the study also agreed with the study (Jaradat, 2020), where the study confirmed that cloud accounting applications will affect accounting programs to a large extent, and the study agreed with the study (Zakir and Sakka, 2020), which stated that cloud computing technologies and pillars exert a direct impact on improving the effectiveness of accounting information, both in terms of strengthening the qualitative characteristics of information. Objectivity and accuracy of measurement methods.

Recommendations

The issue of financial software security is one of the most fundamental reasons behind banks' fear of moving to the cloud, as it is a focus of concern due to the transfer of security control of data once it enters the cloud from the hands of the user to the hands of a specialized service provider, and therefore the researcher recommends to integrate control processes between the cloud service provider and internal units in banks in order to coordinate, fill gaps and inform banks of everything new in that field. The researcher recommends promoting the adoption of cloud computing because of its clear impact on performance in the commercial banking sector, by keeping pace with technological developments and making continuous improvements, and working to hold training courses for workers to raise their capabilities and capabilities to meet the goals.

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