


**THE EFFECT OF CLOUD COMPUTING'S ADVANTAGES AND COMPONENTS ON TIME SAVINGS AND DATA PRIVACY FOR THE QUALITY OF ELECTRONIC BANKING SERVICES**

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ARTICLE INFO	<u>ABSTRACT</u>
<b>Article history:</b>	<b>Purpose:</b> The study aims how the advantages and components of cloud computing affect time savings and data confidentiality to improve the standard of electronic banking services for private Iraqi commercial banks
<b>Received</b> 30 Dezember 2021	<b>Theoretical framework:</b> the purpose of the study to measure the benefits the Cloud computing and impact of the quality of electronic banking in services of saving time and confidentiality of data to know if we can serve bank customers in the future.
<b>Accepted</b> 07 February 2022	<b>Design/methodology/approach:</b> The study relied on the descriptive approach through the use of a questionnaire tool to measure the relationship between the variables.
<b>Keywords:</b> Benefits of Cloud Computing; Elements of Cloud Computing; Saving Time for the Quality of Electronic Banking Services; Data Confidentiality for the Quality of Electronic Banking Services.	<b>Findings:</b> The analysis revealed that, in both of its two dimensions, there is a statistically significant correlation between the advantages of cloud computing and the quality of electronic banking services. The two variables of the quality of electronic banking services and the components of cloud computing are statistically significantly correlated.
	<b>Research, Practical &amp; Social implications:</b> The social repercussions of the benefits of the results of the study through the findings it's; the most essential of which is to guarantee that the provided electronic banking service is as simple to use as possible. This removes the state of fear that could prevent some people from using electronic services because they lack the necessary knowledge.
	<b>Originality/value:</b> the value of the study's originality by measuring the relationship between the cloud computing and electronic banking services; this study is a subject which has not been reviewed in the literature previously in Iraqi environment.
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## O EFEITO DAS VANTAGENS E COMPONENTES DA COMPUTAÇÃO EM NUVEM NA ECONOMIA DE TEMPO E PRIVACIDADE DOS DADOS PARA A QUALIDADE DOS SERVIÇOS BANCÁRIOS ELETRÔNICOS

### RESUMO

**Objetivo:** O estudo visa como as vantagens e os componentes da computação em nuvem afetam a economia de tempo e a confidencialidade dos dados para melhorar o padrão dos serviços bancários eletrônicos para bancos comerciais privados iraquianos,

**Estrutura teórica:** o objetivo do estudo para medir os benefícios da computação em nuvem e o impacto da qualidade dos bancos eletrônicos nos serviços de economia de tempo e confidencialidade de dados para saber se podemos atender os clientes dos bancos no futuro.

**Design/metodologia/abordagem:** O estudo se baseou na abordagem descritiva através do uso de uma ferramenta de questionário para medir a relação entre as variáveis.

**Descobertas:** A análise revelou que, em ambas as suas duas dimensões, existe uma correlação estatisticamente significativa entre as vantagens da computação em nuvem e a qualidade dos serviços bancários eletrônicos. As duas variáveis da qualidade dos serviços bancários eletrônicos e os componentes da computação em nuvem estão estatisticamente correlacionados de forma significativa.

**Pesquisa, implicações práticas e sociais:** As repercussões sociais dos benefícios dos resultados do estudo através dos seus resultados; a mais essencial delas é garantir que o serviço bancário eletrônico fornecido seja o mais simples possível de usar. Isto elimina o estado de medo que poderia impedir algumas pessoas de utilizar os serviços eletrônicos por falta de conhecimento necessário.

**Originalidade/valor:** o valor da originalidade do estudo medindo a relação entre a computação em nuvem e os serviços bancários eletrônicos; este estudo é um assunto que não foi revisado na literatura anteriormente no ambiente iraquiano.

**Palavras-chave:** Benefícios da computação em nuvem, Elementos da computação em nuvem, Economia de tempo para a qualidade dos serviços bancários eletrônicos, Confidencialidade dos dados para a qualidade dos serviços bancários eletrônicos.

## EL EFECTO DE LAS VENTAJAS Y LOS COMPONENTES DE LA COMPUTACIÓN EN NUBE EN EL AHORRO DE TIEMPO Y LA PRIVACIDAD DE LOS DATOS PARA LA CALIDAD DE LOS SERVICIOS DE BANCA ELECTRÓNICA

### RESUMEN

**Propósito:** El estudio tiene como objetivo cómo las ventajas y los componentes de la computación en nube afectan al ahorro de tiempo y a la confidencialidad de los datos para mejorar el estándar de los servicios de banca electrónica de los bancos comerciales privados iraquíes,

**Marco teórico:** el propósito del estudio es medir las ventajas de la computación en nube y el impacto de la calidad de la banca electrónica en los servicios de ahorro de tiempo y la confidencialidad de los datos para saber si podemos servir a los clientes del banco en el futuro.

**Diseño/metodología/enfoque:** El estudio se basó en el enfoque descriptivo mediante el uso de una herramienta de cuestionario para medir la relación entre las variables.

**Resultados:** El análisis reveló que, en sus dos dimensiones, existe una correlación estadísticamente significativa entre las ventajas del cloud computing y la calidad de los servicios de banca electrónica. Las dos variables de la calidad de los servicios de banca electrónica y los componentes de la computación en nube están correlacionadas de forma estadísticamente significativa.

**Investigación, implicaciones prácticas y sociales:** Las repercusiones sociales de los beneficios de los resultados del estudio a través de los hallazgos que tiene; el más esencial de los cuales es garantizar que el servicio de banca electrónica proporcionado sea lo más sencillo de usar posible. De este modo se elimina el estado de temor que podría impedir a algunas personas utilizar los servicios electrónicos por carecer de los conocimientos necesarios.

**Originalidad/valor:** el valor de la originalidad del estudio al medir la relación entre la computación en nube y los servicios de banca electrónica; este estudio es un tema que no ha sido revisado en la literatura anteriormente en el entorno iraquí.

**Palabras clave:** beneficios de la computación en nube, elementos de la computación en nube, ahorro de tiempo para la calidad de los servicios de banca electrónica, confidencialidad de los datos para la calidad de los servicios de banca electrónica.

## INTRODUCTION

The complexity of the workplace and the banking sector overall has increased as a result of technological advancements, the effects of globalization, and the imposition of the concept of the small village. This has raised concerns about the ability of banks to compete in light of the development of electronic banking services so increasing knowledge and using the latest electronic technologies seems to be the only way to develop banking services (Rahman et al., 2022). The study and analysis of two important variables in banking competition are the development of cloud computing technology (as an independent variable) with its axes (the benefits of cloud computing, and the elements of cloud computing) and its impact on service quality. The axes of electronic banking (the axis of time savings and the axis of data confidentiality) (as a dependent variable). The continuous growth of electronic banking services, as well as the high levels of customer expectations for the quality of service provided, necessitates bank management keeping up with electronic development as well as customer trends and expectations. The use of cloud computing improves the quality of electronic banking services, and one method used to reduce financial burdens is to adopt cloud-based banking solutions. As the development of the bank's systems and technical infrastructure can achieve greater efficiency, greater spread and reduce costs, in addition to strengthening the strengths that increase revenues in a way that exceeds any other strategic approach through the use of data stored in the cloud, whether it is information related to the bank's management or information related to the customer in any anytime, anywhere and at a lower cost to perform banking operations.

## RESEARCH METHODOLOGY

### Research problem

The research problem is that banks in Iraq are still providing traditional banking services rather than relying on modern technology, particularly those related to electronic banking services, which has a negative impact on the quality of the bank's electronic services. As a result, the research problem seeks to answer the following question: Does utilizing the benefits and elements of cloud computing lead to an improvement in the quality of electronic banking services in terms of time savings and data confidentiality?

### Research importance

The significance of the research is derived from its contribution to the field of banking work through the potential application of cloud computing technology with its two axes to enhance the efficiency of electronic banking services and data privacy.

### Research aim

The study intends to evaluate how employing cloud computing's advantages and components in banks will affect the quality of electronic banking services as represented by the axes of time savings and data confidentiality.

### Hypothesis research scheme

The dimensions of the variables were selected based on the theoretical and literary frameworks of earlier investigations. As illustrated in the following variables, this scheme integrates the quantitative and qualitative components of the structure of this relationship:

Figure (1) The hypothesis of the study



### Research hypotheses

Based on the research problem and within the framework of its hypothesis, the research hypotheses were formulated as follows:

Ho1: For a sample of commercial banks that are listed on the Iraq Stock Exchange, there is no significant correlation between the advantages of cloud computing and the quality of electronic banking services in its two dimensions, time savings and data confidentiality.

Ho2: For a sample of commercial banks that are listed on the Iraq Stock Exchange, there is no statistically significant correlation between the use of cloud computing and the quality of electronic banking services in either of its two dimensions, time savings or data confidentiality.

### Research sample and community

The research community includes the Iraq Stock Exchange, while the research sample was relied on (3) banks and their customers operating in the Iraq Stock Exchange for analysis

within the commercial banking sector, and the reason for choosing these banks is that they practice electronic operations and provide their data.

The researcher chose a number of commercial banks registered in the Iraq Stock Exchange (Bank of Baghdad, the Middle East Bank, the Arab Gulf Bank) in order to apply the practical side of the research. As the research population included bank clients and those interacting with their electronic services, (70) customers for each bank received (70) forms, for a total of (280) forms, of which (30) were invalid, and (250) data analysis was used. The following are the key requirements for a form that represents the research sample:

Table (1): the composition of the search resolution

Paragraph numbers from- to	number of paragraphs	Sub-variables	Independent variables
Cloud computing dimensions			
4-1	4	Benefits	Cloud computing
8-5	4	elements	
Paragraph numbers from- to	number of paragraphs	Sub-variables	dependent variable
Dimensions of the quality of electronic banking services			
12-9	4	Time saving	Quality of electronic banking services
16-13	4	Data confidentiality	

Source: prepared by the author.

## THEORETICAL FRAMEWORK

### Cloud computing concept and definition:

Cloud computing is defined as (by Whatis.com Encyclopedia of Information Technology): a general term for anything that includes the provision of hosted services over the Internet. The cloud service differs from traditional services in three key ways: it is flexible (i.e., sold on demand by the minute or the hour), the user can choose how much service client wants at any time, and the service is entirely managed by the provider (since the consumer only needs a device with Internet access) (Blue, 2011). According to the National Institute of Standards and Technology (NIST), cloud computing is “a model for enabling convenient, comprehensive, on-demand network access to a shared set of configurable computing resources such as networks, servers, storage, applications, and services that can be rapidly provisioned and launched with minimal administrative effort or interaction with a service provider” (Selviandro & Hasibuan, 2013). It is described as (a kind of parallel and distributed computing system that consists of a collection of connected and virtual computers that are dynamically provisioned and presented as one or more unified computing resources based on a service level agreement

established through negotiation between service providers and consumers) from the perspective of the end-user concept (Alzabari et al., 2019).

### Cloud Computing Benefits

Cloud computing is adopted in many organizations and institutions, especially banking, with many benefits, the most prominent of which can be clarified through the following points:

- a) **Cost savings:** cloud computing offers facilities for the use of banking services like infrastructure, platforms, and service based on requirements. It helps reduce initial cost and avoid placing high-capacity servers, and the amount is calculated based on the use of infrastructure, platform, and other services. This in turn helps reduce costs by precisely defining requirements (Ofemile, 2015). Some people think that the primary reason financial institutions use cloud computing in their operations is to help save costs, as banks constantly look for methods to do so in order to compete in the banking industry (Al-Diban, 2017). This implies that when organizations utilize the cloud, they only pay for the services they really use.
- b) **Time savings:** since there is no need to wait for infrastructure numbers, cloud computing speeds up the process of setting up and configuring banking institutions by offering all electronic services required for conventional banking operations (Sultan, 2010).
- c) **Backup and recovery:** Since all bank data is stored in the cloud, backing it up and recovering it in the event of a loss is much simpler than storing it conventionally (Al-Rubaie, 2019).
- d) **Maximizing resources:** One of the exciting benefits of cloud computing is that it lowers the costs of the information technology unit in banks by using it. Service providers offer excellent flexibility and work with banks to satisfy any sort of requirement (Alnujaimi et al., 2022).
- e) **Access via various electronic devices:** Bank employees can access to perform their duties and work on them while sitting at home without having to travel to the bank thanks to cloud computing, which enables access to cloud computing data and high-capacity storage for anyone with a device to access the Internet. to access their documents and applications, as well as carry out all financial operations from any location and at any time (Hamdan et al., 2018).
- f) **Specialization:** Cloud computing is a platform through which we can modify our needs through redevelopment as it provides a platform for creating and modifying

applications to address a variety of tasks and challenges, especially in banking (Hernández-Nieves et al., 2022).

g) **Collaboration**: Cloud computing provides a convenient way for a group of people to work together on a common project or applications in an efficient manner.

h) **Offering new services**: Multinational companies like Amazon, Google, IBM, Microsoft, Salesforce.com, and others offer cloud services (Flayyih & Flayyih, 2019). Because it is simple to introduce any new application or product at the same time of release, these organizations can be an efficient partner for banks in the age of technological progress.

### Elements of Cloud Computing

According to experts, the following fundamental components must be present in order for cloud computing financial services to be excellent (Moawad, 2012; Al-Taie et al., 2017):

a) **Global Connectivity**: The user must have access to the Internet at any time and place.

b) **Ease of access**: strong, fair and non-discriminatory communication between customers must be provided.

c) **Reliability**: The banking cloud must perform at levels comparable to or superior to those of the traditional financial systems. The possibility of operating in all departments and levels of the bank: it is necessary for users to be able to move between private cloud platforms in all departments of the bank (Buyya et al., 2009).

d) **Security**: User data must be secure.

e) **Privacy**: The rights of customers' data must be protected by not sharing it with any party without the clear consent of customers (Botta & Wiedemann, 2019).

f) **Economic value**: Cloud computing should provide tangible savings and benefits to banks.

g) **Sustainability**: The cloud should raise the efficiency of using banking services and reduce the environmental impact by focusing banking services on financing environmentally friendly projects (Al-khoury et al., 2022).

### The concept of electronic banking service

According to experts, the growth of electronic banks, which date back to the early 1980s and come in two varieties (virtual banks or Internet banks / land banks that practice electronic banking services), is the most notable development in modern banking (Lowe & Barnes, 2012).

It is mentioned that the payment system in Internet banks or electronic banks via the Internet is through three means credit card, electronic checks and electronic cash payment using electronic money (Talab et al., 2017). Internet banking services are the most popular because the use of the Internet has become a competitive advantage for banks. Foreign research indicate that the majority of banks were founded through the use of educational websites initially, then some type of interactive client communication. The three types of online banks are informational websites, interactive websites, and interactive websites (Lovelock & Wirtz, 2004).

According to Al-Haddad (1999: 58), the financial service has two main components:

- A. Beneficial Dimension: This dimension is tied to the client and is represented by the set of advantages that the customer receives from utilizing the financial service.
- B. The Characteristic Dimension: it is reflected in the collection of traits that define the banking service (i.e., it has to do with the service itself) as well as how the banking service is defined (i.e., it is a set of intangible benefits or services offered by the bank to meet customers' credit and financial needs, and either its production is linked to or unlinked from a tangible material product) (Al-Shammari, 2018).

### **Time saving for the quality of electronic banking services**

Time saving time also refers to the next desired outcome following the implementation of the process and the speed of implementation. It is defined as the desire of many beneficiaries to obtain fast and convenient services and is one of the primary factors affecting the field of electronic banking services (Thijeel et al., 2018). A benefit of the level of service received by clients, it's crucial to determine whether they choose to utilize a certain bank's electronic banking services (Bhatia et al., 2012).

### **Ease of use for the quality of electronic banking services**

The compatibility of the bank's website with the ability of the service to be simple and easy to use, where ease of use also refers to the ease of access and use of the bank's website in terms of search, navigation, and dealing, makes the website easy to follow with the least amount of effort through the ability to learn and understand user interfaces and use it effectively and efficiently (Walker, 2016).



## RESULTS

### Statistical analysis of research variables

The third item is to present the findings of the researcher's statistical analysis of the information gleaned from his inquiry into a sample of customers of Iraqi commercial banks listed on the Iraqi Stock Exchange on their perceptions of the two study variables (the benefits and elements of cloud computing for the first variable), and the second variable is the quality of the electronic banking service (the time saving axis and the data confidentiality axis for the second variable).

The responses from the research sample, which totaled (250) views, were then tabulated based on the sample's availability, adoption, and interest in the paragraphs, dimensions, and search variables. The researcher used statistical software (AMOS-SPSS V.23), and other tools to determine the arithmetic mean, standard deviation, coefficient of variation, and relative importance (Microsoft Excel 2018). Given that the questionnaire is based on the gradations of the five-year Likert scale, the calculated averages fall into one of five categories. Through the gradient answer range ( $5-1 = 4/5 = 0.80$ ), the researcher added (0.80) to the lowest grading category, resulting in the following categories (see Table 2):

Table (2) shows the five-point Likert scores

The comment	Category length	Categories	Scale gradient values	Scale degrees
Very weak	1 - 1.80	First Category	1	disagree
weak	1.81 - 2.60	Second Category	2	disagree
Moderate	2.61 - 3.40	Third Category	3	Not sure
available	3.41 - 4.20	Fourth Category	4	agree
very available	4.21 - 5.00	Fifth Category	5	Totally agree

Hypothetical mean = (sum of weights / number of alternatives)  $5 + 4 + 3 + 2 + 1 = 15 / 5 = 3$ .

Source: Prepared by the author based on the results of statistical analysis.

### Analysis of the results of the variables of benefits and elements of cloud computing

The two variables of cloud computing were measured using two of its main dimensions (benefits and elements), eight categories, and (250) responses from commercial banks listed on the Iraq Stock Exchange.

### Analysis after the benefits of using cloud computing

Table (3) depicts the research sample's interest in the variable benefits offered by cloud computing technology, which leads to an agreement on the exchange of benefits acceptable to both the customer and the bank's management. 71 percent), with a standard deviation of (1.171) and a coefficient of difference of (0.28), indicating the answers' homogeneity and convergence.

As for the paragraphs of the four questionnaire questions in which the dimension was measured, the benefits of using cloud computing, paragraph (cloud computing services help the customer in reducing costs and expenses by defining the exact requirements of the banking service) in the first order and with an arithmetic mean (3.61) and a standard deviation (1.26) and the importance of Relative (72%) and with a coefficient of difference (0.35), which indicates that customers are more interested in reducing the volume of expenditures made in order to obtain banking services, which is achieved by computing technologies (See Table 3).

Table (3) Analysis of the answers of the research sample about the benefits of cloud computing n=250

coefficient of relative	Relative importance	standard deviation	Arithmetic mean	response measurement										category	
				Totally disagree		I disagree		Uncertain		Agree		Totally agree			
				%	No.	%	No.	%	No.	%	No.	%	No.		
				Cloud computing services help the customer reduce costs and expenses by defining the exact requirements of the banking service.											
35%	72	1.269	3.61	7.6	11	15.3	22	16	23	31.3	45	29.9	43	1	
				Banks provide facilities to meet any type of customer requirements at any time and this is one of the exciting advantages of cloud computing											
36%	71	1.273	3.54	9.7	14	13.9	20	13.9	20	37.5	54	25	36	2	
				As a customer, you can access your files and other applications anytime and anywhere using your mobile phone.											
35%	68	1.196	3.40	6.3	9	18.1	26	27.8	40	25.7	37	22.2	32	3	
				Cloud computing provides a convenient way for you as a group of customers to work together through common applications.											
31%	72	1.098	3.60	4.9	7	13.2	19	18.8	27	43.1	62	20.1	29	4	
28%	71	1.171	3.54	Cloud computing benefits											

Source: Prepared by the author based on the results of statistical analysis.

### Analysis of customer interest in cloud computing elements

It is clear from the results of Table (4), the interest of customers in the research sample, the interest of customers in the elements of cloud computing, and this confirms the existence of an exchange of benefits for both sides of the bank (management and customers) and with a relative level of interest (71%), so this dimension was obtained on a weighted arithmetic mean (3.54), a standard deviation (1.145), and a coefficient of difference (0.25), which indicates the homogeneity and convergence of the answers.

The five items that were measured after the customers' interest in the elements of cloud computing showed that the paragraph (interoperability: cloud computing provides space for you as a user to move between different cloud platforms) came in the first order with an arithmetic mean of (3.61) and a relative importance (72%) and with a standard deviation (1.123) and a coefficient of variation (31%), which is an indication that the customer is interested in moving between different cloud platforms, which provides a margin of freedom and experience of many programs and applications (See Table 4 and Table 5).

Table (4) Analysis of the answers of the research sample about the interest of customers in the elements of cloud computing n=250

coefficient of Relative standard deviation	Arithmetic mean	Response measurement										category		
		Totally disagree		disagree		uncertain		agree		Totally agree				
		%	No.	%	No.	%	No.	%	No.	%	No.			
Global Communication: Cloud computing provides an open space for the customer to communicate with the bank from anywhere in Iraq and the world.														
31%	71	1.109	3.53	4.2	6	15.3	22	25	36	34.7	50	20.8	30	5
Interoperability: Cloud computing provides space for you as a user to move between different cloud platforms.														
31%	72	1.123	3.61	6.3	9	11.8	17	16.7	24	45.1	65	20.1	29	6
Privacy: You are clearly defined as customers of your rights and the protection of your data by the bank's management.														
34%	72	1.225	3.60	7.6	11	12.5	18	18.8	27	34	49	27.1	39	7
Sustainability: Cloud increases energy efficiency and reduces environmental impact.														
33%	68	1.124	3.40	6.3	9	18.8	27	16.7	24	45.1	65	13.2	19	8
25%	71	1.145	3.54	Cloud Computing Elements										

Source: Prepared by the author based on the results of statistical analysis.

Table(5): Analysis of the answers of the research sample about the two variables of the benefits and elements of cloud computing n=250

No.	category	coefficient of relative variance	Relative importance	Standard deviation	Arithmetic mean
1	Benefits	28%	71%	1.171	3.54
2	elements	25%	71%	1.145	3.54
total	Cloud computing	%27	%71	1.158	3.54

Looking at the Table (5), it is clear that the two cloud computing variables (benefits and elements) recorded an arithmetic mean (3.54) that is higher than the study's hypothetical mean, with relative importance (71%), standard deviation (1.158), and a coefficient of difference (0.27) which indicates that The research sample's interest in the variable and its recording of answers that are consistent and consistent with what was stated in the statements, which confirms the reliance of the research sample banks on this variable to complete the operations of electronic banking services, and at the level of the sub-variables, according to the table above, the two variables recorded the benefits and elements higher in the arithmetic mean (3.54) and with relative importance (71%), which confirms the interest of the research sample in the two mentioned elements.

### Analysis of the results of the variables of saving time and data confidentiality for the quality of electronic banking services

The variable was measured in terms of the quality of electronic banking services on two dimensions (time saving and data confidentiality), across (8) paragraphs, based on the responses of (250) observations in commercial banks listed on the Iraq Stock Exchange and my agencies:

***After time saving for the quality of electronic banking services***

According to the results of Table (6), an arithmetic mean (3.36), which is greater than the hypothetical mean, was reached after time saving, with a coefficient of difference (0.29), a relative importance (67 %), and a standard deviation (1.251), indicating that the research sample agreed on the importance of this element as one Criteria for assessing the quality of banking service. While the sentence (the employee promptly and adequately responds to your enquiries via technological means)) recorded the highest arithmetic mean (3.36), a coefficient of difference (0.35), a standard deviation (1.183), and a relative importance (68%), which is the matter that the banking administrations should pay attention to and enhance the interest in training the working staff on the mechanisms of cooperation and dealing with customers, as they, that is, the human cadre, constitute the most decisive factor in providing a quality banking service, as shown in the results of the Table 6:

Table (6) Analysis of the answers of the research sample about time saving n=250

coefficient of relative	Relative importance%	Standard deviation	Arithmetic mean	Response measurement										Category
				Totally disagree		disagree		uncertain		agree		Totally agree		
				%	No.	%	No.	%	No.	%	No.	%	No.	
The bank's management adopts the time criterion as one of the criteria for competition in providing banking services.														
38%	67	1.294	3.37	10.4	15	17.4	25	20.1	29	29.2	42	22.9	33	9
There are timetables to determine the mechanisms and procedures for banking transactions that are carried out electronically and reduce the waiting period.														
38%	67	1.273	3.33	9.7	14	19.4	28	20.1	29	29.9	43	20.8	30	10
The customer feels that the electronic services are designed in a way that takes into account the standard of time by paying attention to the basic information that reduces the wasted time.														
37%	67	1.256	3.37	9	13	19.4	28	17.4	25	34	49	20.1	29	11
The employee answers your inquiries through electronic means quickly and adequately.														
35%	68	1.183	3.38	9	13	13.9	20	23.6	34	36.8	53	16.7	24	12
29%	67	1.251	3.36	After time saving										

Source: Prepared by the author based on the results of statistical analysis.

***After data confidentiality for the quality of electronic banking services***

The results of Table (7) make it clear that one of the criteria for the quality of electronic banking services, data confidentiality, obtained an element with an arithmetic mean (3.30), relative importance (66 percent), coefficient of variation (0.26), and standard deviation (1.166), which is a significant indicator that everyone who works in banking should be closely monitored. As for the detailed paragraphs of the variable, the paragraph (the applications provided by the bank include protection programs from electronic piracy in a sophisticated and high-accuracy manner) came in the first order with an arithmetic mean (3.32) and a relative importance (66%) and a standard deviation (1.144) and a coefficient of difference (0.34).

Customers now expect data confidentiality in the institutions they deal with because they are more aware of the cyberattacks that society as a whole, banking, and personal accounts are susceptible to. As a result, bank managers must prioritize data confidentiality in their ideas and philosophies for the various working departments in the field, as shown in the Table 7.

Table (7) Analysis of the answers of the research sample about the data confidentiality dimension n=250

Coefficient of relative variance%	Relative importance	Standard deviation	Arithmetic mean	Response measurement										Category
				Totally disagree		disagree		uncertain		agree		Totally agree		
				%	No	%	No	%	No	%	No	%	No	
The bank's management places the issue of maintaining the confidentiality of customer data at the forefront of its priorities.														
37%	66	1.237	3.31	9.7	14	18.1	26	21.5	31	32.6	47	18.1	26	13
Electronic services are designed in an electronic way that ensures that none of the customer's data is viewed by others.														
36%	66	1.191	3.28	8.3	12	19.4	28	24.3	35	31.9	46	16	23	14
The applications offered by the bank include advanced and high-resolution protection programs from electronic piracy.														
34%	66	1.144	3.32	6.9	10	18.1	26	26.4	38	33.3	48	15.3	22	15
The management of the bank informs customers of the new mechanisms that keep their data confidential on an ongoing basis.														
33%	66	1.093	3.28	5.6	8	21.5	31	23.6	34	38.2	55	11.1	16	16
26%	66	1.166	3.30	After data confidentiality										

Source: Prepared by the author based on the results of statistical analysis.

According to the above table (8), the variables of time saving and data confidentiality recorded an arithmetic mean of (3.36) and (3.30), which is higher than the hypothetical mean, and with standard deviations of (1.251) and (1.166), respectively, and with relative importance (67 %) and (66% ). With a relative coefficient of difference of (0.29) and (0.26), and based on the responses above, the research sample's interest in the criteria used in evaluating the quality of banking services provided by banks in electronic formats, and at the level of sub-variables, the time-saving variable came in first place with an arithmetic mean (3.36) of relative importance (67 %), indicating that any bank's management must be alert to deal with time and provide electronic services without delay.

Table (8) analyzes the research sample's responses to the elements of time savings and data confidentiality for the quality of electronic banking services.

No	dimension	Coefficient of relative variance	Relative significance	Standard deviation	Arithmetic mean
1	Time saving	29%	67%	1.251	3.36
2	data confidentiality	26%	66%	1.166	3.30
total	The quality of electronic banking services.	%28	%67	1.208	3.33

Source: Prepared by the author based on the results of statistical analysis.

### **Analysis of the relationship between the benefits of cloud computing and the quality of electronic banking services in its two dimensions: saving time and data confidentiality**

The researcher concluded that an analysis of the advantages of cloud computing revealed two medium-term significant correlations with the variable, the quality of electronic banking services, and their dimensions. With a percentage of (100%) of the relationships, the strongest of these correlations was with the variable, the quality of electronic banking services at the general level (\*\*0.411). As for the correlations of the benefits dimension with the sub-dimensions of the quality of electronic banking services, the relationship of the benefits of cloud computing topped the data confidentiality dimension (4550.) of medium strength, then followed, in order, with the time saving dimension (0.427\*\*) of medium strength.

Which supports the researcher by rejecting the second sub-hypothesis Ho1 of the first main hypothesis (there is no significant correlation with statistical significance at the level ( $\alpha \leq 0.05$ ) between the benefits of cloud computing on the quality of electronic banking services in its two dimensions, time saving and data confidentiality for a sample of commercial banks registered in the market Iraq Stock Exchange).

We can see from the above-mentioned relationships that depict the form and level of correlation that the research and its theoretical framework have already established these frameworks of interrelationship between the variables, and from them the researcher can point out that what was involved in the clauses and indicators of the benefits of cloud computing actually constitutes a fertile field for the interaction of customers with electronic banking services in terms of time saving and confidentiality of data. Which the author actually views as beneficial, such as the capability for the customer to complete his transaction and access his data via his mobile phone, giving him a space for cost savings, multiple participation with the group of customers, and framing official relations with a human and interactive survey between customers of different banks through electronic clouds that grant such advantages.

### **Analysis of the relationship between the elements of cloud computing and the quality of electronic banking services in its two dimensions: saving time and data confidentiality**

As the researcher learns more about cloud computing, it becomes apparent that there is a strong correlation between the dimensions and the quality of electronic banking services, as well as a percentage (100%) of the relationships. The strongest of these relationships with the variable was the quality of electronic banking services in its two dimensions of saving time and data confidentiality at the general level (0.335\*\*) of medium strength. The strongest relationships between cloud computing components and the dimensions of data confidentiality

(0.388\*\*) and time savings (0.282\*\*) came in first and second place, respectively. This is because all correlations are significant at the level ( $\alpha \leq 0.05$ ).

Consequently, the second sub-hypothesis Ho2 of the first main hypothesis (There is no significant correlation with statistical significance at the level ( $\alpha \leq 0.05$ ) between the elements of cloud computing on the quality of electronic banking services in its two dimensions, saving time and data confidentiality for a sample of commercial banks registered in the market Iraq Securities) is rejected, thereby supporting the author. What appeared from the above data, is practically clear the relationship that the author referred to between the mentioned elements of cloud computing and with electronic banking services in its two dimensions, time saving and confidentiality of data bearing the characteristics of quality. Which actually shows that the banking industry is operating within its general framework and that technology has permeated its various details, but any technology cannot achieve good services unless it is supported by elements that draw customers in and abide by the contemporary general frameworks that confirm that banking performance standards include environmental indicators and nearly global communication. In which languages are unified and borders are eliminated, to form a convergent picture that brings together the categories and forms of banking institutions in the world (See Table 9).

Table (9). Analysis of the relationship between the elements of cloud computing and the quality of electronic.

No	variable	Ratio and number of relationships	Quality of electronic banking services	Data confidentiality	Time saving
1	Benefits	2	0.441**	0.455**	0.427**
		100%	0.000	0.000	0.000
2	Elements	2	0.335**	0.388**	0.282**
		100%	0.000	0.000	0.001

Source: Prepared by the author based on the results of statistical analysis.

## CONCLUSIONS

There is a significant gap in the literature on cloud computing for banking work, including books, studies, research, articles, and working papers. In both dimensions, there is a statistically significant correlation between the benefits of cloud computing and the quality of electronic banking services. There is a significant correlation between the elements of cloud computing and the quality of electronic banking services. The field study revealed that the electronic banking services provided by the study sample banks are primarily distinguished by their ability to provide the desired interest in the shortest possible time, which is at the forefront of the standards that banking organizations prepare primarily in their competition and provision

of services known as quality. In the research sample banks, cloud services offer their clients a number of real benefits, which should be improved through the spirit of initiative, success, and perseverance in monitoring current technical work through the use of more sophisticated programs. Members of the study sample expressed interest in the overall quality standards of the electronic banking services offered, demonstrating their level of aspiration to receive banking services that meet or surpass their expectations. The study sample banks have services that are easy to use at a level that allows individuals to use them despite not having a high level of skill and technical knowledge. However, the weakness of technical services in their colloquial capacity constitutes an obstacle to the largest possible number of individuals obtaining those services, which in many aspects is not It is directly related to banks, as the electronic communications sector in Iraq in general has many problems.

## RECOMMENDATIONS

- a) Commercial bank administrations ought to pay more attention to cloud computing services, particularly the use of contemporary software and connecting active banks with twinning relationships and joint projects with businesses and cutting-edge organizations in this field, as well as taking advantage of the open conditions that the authorities in charge of the banking sector seek to establish within the general principles of work in the sector.
- b) Commercial bank administrations should pay close attention to cloud computing models and their developments by making practical choices regarding the activation of global levels of communication in a way that ensures achieving a state of communication between banks, their people, and their clients with the state of global development.
- c) It is essential that the management of the running banks activate the cases of the variety of cloud types that are available and select the closest, best option that also fits the characteristics of the Iraqi environment. As a result, the customer will see a variety of clouds in his field of vision, which always happens after reaching a more advanced degree of confidence.
- d) By launching the training and qualification efforts for these cadres in a way that fosters responsibility and equips them to interact with the bank's customers at a level that achieves the state of human interaction that frames the electronic work, bank administrations can ensure that the cadres working in the electronic banking services



sector are prepared to a level worthy of the banking work and the reputation of these organizations.

e) Assuring the best level of usability for the offered electronic banking service, in a way that eliminates any condition of dread that might prevent some people from adopting electronic services because they lack the necessary understanding.

f) One of the main factors that encourages many customers to choose the electronic option over traditional banking work is the development of electronic software for banking services that ensures better time savings and lowers workshops and processes that may be required to consume banking services.

g) Customers are particularly sensitive to this most crucial criterion for many people, especially in the banking environment in Iraq, thus bank administrations must secure the greatest levels of secrecy and safeguard the privacy of customers' data and accounts if they wish to satisfy them.

h) Banks must attain the highest level of security due to the electronic risks to which the banking industry is exposed, especially in light of the significant growth in the number of cases of electronic extortion and piracy, as well as the permissive laws and legal framework that govern this kind of penetration.

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