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Using Cloud Computing Services In The Knowledge Sharing Process In Iraqi Universities

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Abstract

The study aimed to reveal the effect of cloud computing in sharing knowledge, and to achieve the essence of the methodology, a questionnaire was developed to ensure the existence of a relationship between the study variables. The study sample included (307) questionnaires on faculty members in Iraqi public universities, and their data was analyzed using the program (SPSS V.24, Excel 2013).
The results of the study showed that there is a significant effect of cloud computing on knowledge sharing. Therefore, universities need to rely on cloud computing to share knowledge. The results of the current study can contribute to directing the attention of workers in the educational sector towards the use of cloud computing applications to share knowledge in the educational process, thus increasing the chances of the lab to achieve its goals and objectives.

Keywords: cloud computing, knowledge sharing, infrastructure, software, networks, security.

INTRODUCTION

Motivation and background

Despite the importance of cloud computing and the services it provides in areas of private life and education, it is still in its infancy in developing countries, providing an opportunity for educators to keep up with modern global trends in the field of learning through continuous learning about the outcomes of learning (Al-Nashwan, 2016) Due to the quick growth in cloud computing adoption, cloud computing research has just recently begun, and there is still a need for additional study (Sanjiv & Franklyn, 2015) [1].

Additionally, traditional educational techniques and patterns are no longer capable of keeping up with contemporary advancements, and students' learning is no longer confined to being physically present in the lecture hall in the era of e-learning (Al-Ahmadi, 2012). Despite the proliferation of cloud computing apps and the expansion of their uses, it has become important to adhere to new scientific methods. It enables learners to use cloud-based programs such as e-mail, Google educational applications, and others at any time and from any location; as well as database and social networking applications [2].

The foregoing has necessitated the adoption of modern trends and methods in education, and one of the most significant of these trends is cloud computing, owing to the development of its applications and the potential for benefiting from it in developing education, raising the level of quality, and improving outputs. Cloud computing is a process by which processing and storage operations are transferred from the user's computer to a device. Cloud computing is a type of server that can be accessed via the Internet at any time and from any location, and it is one of the most widely used technological methods due to its ability to aid in the process of data access. By incorporating cloud computing into the teaching and learning process, it is possible to enhance student learning. Where students may simply subscribe to books, magazines, software, and other educational resources via the cloud storage service (Soni et al, 2018) [3] .Universities provide education to their students, make

decisions through committees, and share information and expertise. Because KS (Knowledge Sharing) is known to improve competitive advantage, if it is better understood and implemented at educational institutions, it can also assist prepare better graduates and serve as a good indicator of the assurance of learning [4].

Research question

a. What is the perception of the study sample members of the importance of using cloud computing in sharing knowledge?

b. What is the relationship between cloud computing and knowledge sharing?

c. What is the impact of computing on knowledge sharing?

Objective of the study

The study aimed to find out the importance of cloud computing In making the knowledge sharing to be successful, a person should understand the concept of knowledge management processes and the knowledge sharing process in particular. According to, in the networking environment, it depends on the individual on how they share the knowledge. In this era technology, anyone can share their knowledge through software and hardware application as there is an also synchronous method for example forums and chat room which enable user to make them eager share their knowledge. In this case, cloud computing will make user know on which place is the right platform for them to share their ideas as well as contribute to the social sharing knowledge environment. The objectives of the study can be clarified through the following:

a. Determining the awareness of the research sample members of the importance of using cloud computing in sharing knowledge.
b. Define a relationship between the use of cloud computing in sharing knowledge.
c. Determining the impact of using cloud computing on participation.

Significant of study

The research deals with the issue of cloud computing, which has recently received great interest from researchers in different disciplines as well as various institutions, in light of the trend towards a digital knowledge society and the employment of electronic computer technology in the educational process.

This study works on defining the importance of cloud computing service applications, its features, benefits, drawbacks, and its future in the educational process. And the role of higher education institutions in embracing this service, working within an attractive interactive educational environment, and seriously thinking about how to take advantage of cloud storage, integrating and employing it in the educational process to knowledge sharing, leading to the distinguished performance that meets the requirements of the educational aspect, and establishes the concept of e-learning, to achieve quality education, to meet the needs of students, serve the community, and keep pace with scientific progress.

Research methodology

The research methodology used is the quantitative research approach, the questionnaire will be used as a tool to collect data, From the universities surveyed. Moreover, Moreover, Statistical analysis will be used to analyze the data through a program (SPSS and Excel).

Scope of the study

This research will focus on cloud computing use in Iraqi universities(University of Mosul, Northern Technical College, Baghdad University, University of kufa, University of Basrah, University of Sumer, Tikrit University, and Misan University) will be the community for this study, in order to determine the impact of cloud computing on knowledge sharing. The study sample targeted professors of educational institutions in Iraq.

Thesis organization

This thesis is organized into four axes: The first axis, the introduction, includes the research methodology. The second axis is a literature review that includes cloud computing, knowledge sharing, the link between cloud computing and knowledge sharing, and related studies. The third axis includes the practical framework. The fourth axis includes the results.

The hypotheses of the study

H1: There is correlation between cloud computing and its dimensions and knowledge sharing.

H2: There is effect between cloud computing and knowledge sharing.

H3: There is effect between infrastructure and knowledge sharing.

H4: There is effect between software and knowledge sharing.

H5: There is effect between communication and knowledge sharing.

H6: There is effect between flexibility and knowledge sharing.

H7: There is effect between reducing costs and sharing knowledge.

H8: There is effect between security and knowledge sharing.

The figure.1 below illustrates the hypothesis model.

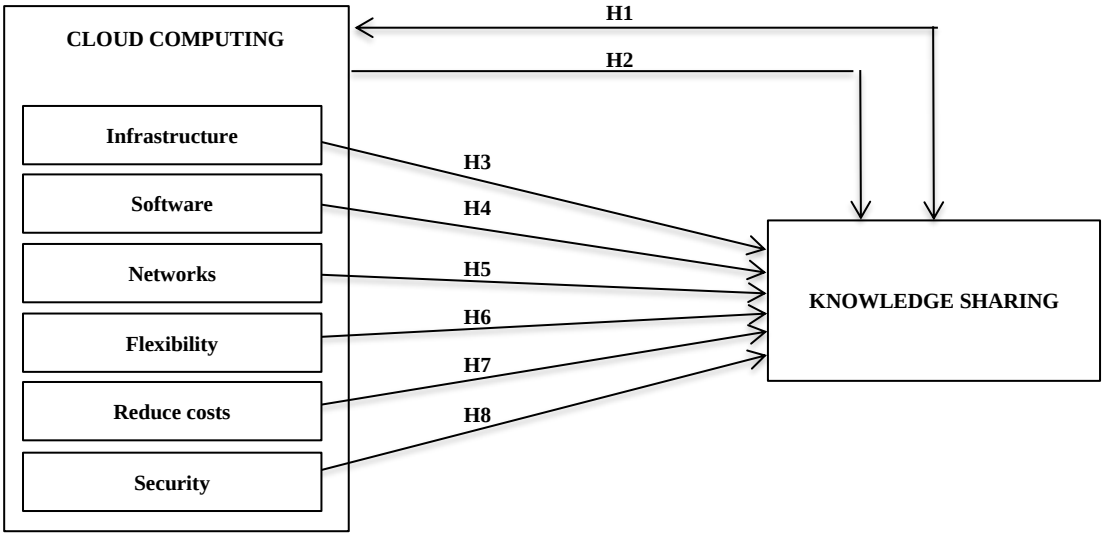

Fig. 1: The research model.

LITERATURE REVIEW

Cloud computing

Cloud Computing is becoming an adopted technology for many of the Organization, Companies and Educational Institutes with its dynamic scalability and exploitation of virtualized resources as a service through the Internet. It will eventually have a substantial impact on educational institutions. Cloud computing is a wonderful solution for educational institutions which are especially under budget shortage in order to function their information systems effectively without investing any additional cash for the computers and network devices. Universities take advantage of various cloud-based solutions given by service providers and enable their own students. lecturers to do business and academic duties [5].

Asserted (Garfinkel, 1999) As early as 1961, John McCarthy of MIT proposed "if computers of the kind I've recommended become the computers of the future, then computing may someday be organized as a public utility, just as the telephone system is a public utility. We may see a new and major industry grow out of the computer utility [6].

According to Furht and Escalante (2010), cloud computing is a concept in which services are created on the fly while users are accessing services through the Internet, and the services are dynamically scaled. Previously, the cloud was frequently used to indicate a portion of the Internet that included some infrastructure Nowadays, the term "cloud" is used as a metaphor to refer to services that are offered over the Internet. Cloud computing has evolved rapidly in recent years. Due to the rapid advancement of cloud computing, cloud computing now supports a huge number of

operations in a fraction of a second, in comparison to traditional systems with a restricted number of transactions. This computing capability can be applied to a variety of tasks, including pre-processing, analysis, and anticipating future occurrences. Cloud services require users to maintain a connection with their devices in order to access and work on these virtual machines with vast processing capacity located all over the world [6].

The term "cloud" is used metaphorically to refer to the Internet, based on the cloud graphics that was previously used to depict the telephone network and is now used to define and represent the Internet in computer network schemes, represents an abstraction image of the infrastructure [7].

The cloud is a well-known cliche as a metaphor for the Internet, but when paired with the term 'computer,' the connotation becomes more ambiguous. Cloud computing refers to any subscription-based or pay-per-use service that augments existing IT capabilities in real time over the Internet. There is a large workload change in a cloud computing system. Local computers are no longer required to perform all of the heavy lifting associated with program execution. They are instead managed by the cloud's network of computers. On the user's side, hardware and software requirements drop. The only software that has to be installed on the user's computer is the cloud computing system's interface program, which can be as simple as a Web browser; the cloud's network does the rest of the work [8].

Generally speaking, cloud computing is a type of computing that is very scalable and makes use of virtualized resources that can be shared among users. Users do not need to have any prior understanding of the services in order to use them. A users on the Internet can communicate with a set of servers at the same time, and these servers can share information with one another as well [9].

Additionally, the NIST issued a definition of cloud computing: Cloud computing is a model for providing convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with little management effort or interaction from service providers [10].

Cloud computing is a technology that enables users to access software and other computing resources through the Internet, minimizing the need for users to download these resources on their own or local computer [11].

"Cloud computing" is defined as a technology that relies on the transfer of processing and computer storage space to the so-called cloud, which is an Internet-accessible server, so that information technology software can be transferred from products to services via the Internet [7].

When given a technical description, cloud computing is defined as a collection of distributed computing infrastructure (server farms and massive data centers) that provides on-demand services and resources through a network (often known as internet). Cloud computing service providers enable their customers to scale up or decrease their utilization of the services in response to their requirements, as needed [12] [13].

(Yasen, 2014) In order to use cloud computing, a clients or user interface to meet the needs a number of requirements [14]:

- A personal computer with an internet connection.
- An operating system that enables the connection of a computer to a network that is not the Internet.
- An Internet browser that is compatible with the large site and is capable of being utilized in cloud computing environments.
- Availability of access to a network other than the Internet, preferably one with high speed, because this network is the link between an individual and all of his or her data and all of the programs they or they utilize.
- Provider of cloud computing services it is similar to a web hosting service provider, but it possesses certain qualities that enable all developers and users to make the most efficient use of the servers' resources. As both customers and application developers will spend more time on cloud computing service providers' servers.

Knowledge sharing

Educational institutions are currently confronted with a number of challenges resulting from the emergence of the digital economy and the digital

revolution. One of the most significant of these challenges is the knowledge production process, which requires new methods and management, it's called knowledge management. This increases its position because of the knowledge it provides to universities, They are necessary, to keep the available ones, apply and develop it develop their performance, and rely on them for their superiority. As among the pillar of knowledge management operations, knowledge sharing demonstrates its importance in the university's requirement for information transfer, dissemination, and sharing outside and in the university [15]. Knowledge sharing could be viewed as a substantial process in businesses since it is necessary for the creation of new ideas and the development of new business possibilities via the socializing and learning processes of knowledge workers Enhancing an organization's ability to manage information sharing both within and across the company is thus one of the primary issues it faces today. According to (Dyer and Nobeoka), knowledge sharing can be defined as the activities that facilitate the collaboration of communities of people by sharing and exchanging of their knowledge and enhancing their ability to achieve individual and enhancing organizational learning capacity organizational goals. And Additionally, multiple kinds of research have demonstrated that when employee knowledge is shared, its organizational value grows. Organizations may begin to manage knowledge resources successfully only when individuals are eager to share their knowledge with peers. As a result, identifying which factors support or inhibit employee proclivities for knowledge sharing is critical [16].

Knowledge sharing activities are described as those that include the dissemination or transfer of knowledge among individuals, groups, or organizations (Lee 2001; Tong et al. 2015), in which individuals exchange tacit and explicit knowledge to create new knowledge (Tong et al. 2015; van den Hooff and De Ridder 2004) [17]. Knowledge sharing is a process that occurs between individuals who share a common goal, common interest, or are confronted with similar problems. It is not specific to explicit or explicit knowledge exchange within an institution, and also includes the sharing of tacit knowledge latent in human brains. From one person to another, or from one group to another, it must be communicated in an understandable and usable manner. Additionally, it means that the sender retains ownership of the information, which becomes joint ownership between both the sender and receiver. Additionally, it concludes that information sharing is a Volunteer act and that coercing members to do so is difficult. Rather than that, they can be convinced to develop favorable attitudes toward it. Finally, information sharing is learning process in which individuals continuously learn and interact to foster creativity and innovation [18].

Knowledge sharing can take place through written correspondence or face-to-face interactions with other professionals, as well as through documenting, organizing, and capturing knowledge for another (Cummings, 2004; Pulakos et al., 2003). While the term "knowledge sharing" is more frequently used than "information sharing," researchers frequently use the term "information sharing" to refer to the sharing of information with others that occurs in scientific studies where participants receive lists of information, programs, and manuals. The term "knowledge sharing" is distinct from the terms "knowledge transfer" and "knowledge exchange." Knowledge transfer entails both the dissemination of knowledge by the source of knowledge and the acquisition and implementation of knowledge by the receive [19].

Knowledge is a valuable resource for organizations who hold a knowledge-based view, Work is done with knowledge as it is an important resource for the company to maintain its competitive advantage (Suppiah and Sandhu, 2011; Abdul Rauf, 2016; Jasimuddin, 2005) [20].

Knowledge sharing is regarded as a procedure in the field of information management. Lindblom and Tikkanen (2010) define knowledge management as "an intentional strategy of getting the correct knowledge to the right person at the right time and assisting individuals in sharing and putting information into action in methods that will boost organizational competitiveness" While knowledge can be exchanged at the personal, group, and organization level, as well as within and across organizations, knowledge sharing is inherently a two-way street. According to Ipe (2003), knowledge sharing is the act of making knowledge accessible to others, whereas knowledge sharing between people is the process by which an individual's knowledge is translated into a form that others can understand,

absorb, and apply. According to Hendriks (1999), knowledge sharing entails a relationship between parties: one who holds knowledge and another who acquires it [21].

Data Analysis

In order to identify the main components and sub-variables adopted in the study model and its hypotheses and the nature of the correlation and influence relationships between cloud computing and knowledge sharing, this part has been devoted to describing and diagnosing the study variables, verifying the validity of its default model and testing its hypotheses.

Describe and diagnose the study variables

This part deals with the description and diagnosis of the study variables, using arithmetic means, standard deviations, standard error, and for each of the study variables. To achieve this, this section has been divided into four sections:

Characteristics of the responding individuals

Before starting to analyze the data, describe the study variables and discuss them, we will present the demographic data of the study sample shown in the table 1, where it was found that (61.2%) were for males and the rest for females, the largest percentage of the sample was within the age group (31-40 years). At a rate of (52.4%), it is also clear that the percentage of faculty members who hold a master's degree is the largest (57.3%), and the percentage of those holding the scientific title of assistant lecturer is the largest (35.5%). As for the level of experience in the use of information and communication technology, it was found that the majority of the sample was good or higher (63.8%).

Table 1 Demographic details of the respondents

Variable		N	%
Gender	Male	188	61.2
	Female	119	38.8
Age	≤ 30	53	17.3
	31- 40	161	52.4
	41-50	58	18.9
	≥ 51	35	11.4
Academic achievement	Ph.D	72	23.5
	M.Sc	176	57.3
	B.Sc	59	19.2
Scientific title	Asst. Lecturer	67	21.8
	Lecturer	68	22.1
	Asst. Prof	63	20.5
	Prof	109	35.5
Level of experience in the use of ICT	Acceptable	38	12.4
	Intermediate	73	23.8
	Good	110	35.8
	V. Good	54	17.6
	Excellent	32	10.4

We conclude from the foregoing, that the respondent individuals meet the appropriate conditions to answer the paragraphs of the questionnaire, and thus lead to accurate and objective results.

Consistency of internal consistency

For the purpose of ensuring the reliability of the study tool and internal consistency and knowing the extent to which each paragraph of the tool is interconnected with the dimension or axis to

which it belongs, the researcher used the (Cronbach's Alpha) test, and the accepted value is (0.60) according to the point of view of (Sekaran & Bougie, 2003) [22].

The item Analysis method was also used, based on the Corrected Item-Total Correlation test, to choose the most appropriate items to explain the variable or dimension used in the study tool, and the items that have a correlation less than (0.15) or a negative value that indicates discrimination. Reverse, and that the paragraph does not belong to the measured axis. The stability values can be modified either by reformulating the paragraphs and then reapplying or deleting them before conducting the final study [23], and as shown in the appendices, all the factors of the study tool ranged between (0.644-0.818), which are Statistically acceptable because its value is greater than (0.60) according to (Cronbach's Alpha) test. And according to (Item Analysis) factor analysis through the (Corrected Item-Total Correlation) test, it was found that the paragraphs are appropriate to explain the variable or dimension used in the study tool.

Descriptive statistics for the study variables

This axis presents the results of the applied study, its analysis and interpretation, by reviewing the respondents' opinions, which were revealed by their responses to all paragraphs of the study tool, In order to achieve this, the researcher used descriptive statistical analyzes (such as mean, standard deviation and standard error) using the SPSS V. 24 program. The answers of the respondents, numbering 307, regarding the interest in the dimensions and variables of the study, and the consistency with its paragraphs, were described and diagnosed by using the arithmetic mean to determine the consistency of the respondents' answers to the paragraphs, as well as the extent of their acceptance towards the availability of study variables and dimensions. The standard deviation that measures the extent of dispersion of the data (respondents' answers) from the arithmetic mean of (3) was used, as the decreasing value of the standard deviation indicates that the data are close to the arithmetic mean and vice versa. The standard error scale was used to determine the accuracy of the respondents' answers [24]. And as follows:

Analysis and diagnosis of the independent variable (cloud computing)

The independent variable (cloud computing) includes (29) paragraphs, divided into six dimensions (infrastructure, software, communication networks, flexibility, cost reduction, security). The descriptive statistics (arithmetic mean, standard deviation and standard error) for the paragraphs of the independent variable were as they appear in the table 2.

Table 2 Descriptive Statistics for the Independent Variable (Cloud Computing)

Dimensions	Questions	Mean	Std. D.	Std. E. Mean
Infrastructure	The adoption of cloud computing contributes to maintaining databases in the event of any natural disasters or accidents, whether technical or fires.	4.108	0.91	0.012
	The adoption of cloud computing provides high flexibility to expand storage capabilities.	4.101	0.855	0.049
	Cloud computing eliminates the organization's concern with the characteristics and capabilities of the servers and computers used.	3.824	1.042	0.019
	Cloud computing controls the storage capacity of databases without technical obstacles.	3.87	0.998	0.017
	The adoption of cloud computing reduces the technical pressure on the devices used in knowledge sharing.	3.99	0.944	0.014
Software	Adopting cloud computing contributes to keeping pace with modern hardware and software.	4.225	0.807	0.046

Dimensions	Questions	Mean	Std. D.	Std. E. Mean
	Cloud computing provides software as per business requirements.	4.065	0.944	0.014
	The flexibility of operating systems and cloud applications allows dealing with all traditional operating systems.	3.86	0.962	0.015
	Cloud computing allows leveraging the software expertise of a cloud service provider.	3.977	0.927	0.013
	The cloud computing service provider seeks to develop the software used by relying on specialized competencies.	4.052	0.938	0.014
Networks	The cloud computing service provider guarantees always-on connectivity services.	4.016	0.972	0.015
	Cloud computing ensures effective communication and reduces pressure on IT units and departments in the organization.	4.023	0.916	0.012
	Cloud computing ensures that information arrives in a timely manner.	4.046	0.914	0.012
	Cloud computing supports teamwork and business teams.	4.029	1.004	0.017
Flexibility	Cloud computing enables applications to be used and expanded with ease.	4.114	0.906	0.012
	Cloud computing helps to access applications at any time, place and from any device.	3.866	1.096	0.063
	Cloud computing provides flexibility to change according to the goals and work required	4.003	0.895	0.011
	Cloud computing ensures high flexibility in dealing with Internet browsers.	4.088	0.916	0.012
	Cloud computing allows the user to access databases at any time and place.	3.994	1.01	0.018
	Cloud computing makes it possible to work together simultaneously.	3.922	1.023	0.018
	Cloud computing provides flexibility in data update procedures, such as deleting, adding, and modifying.	4.023	0.92	0.012
Reduce costs	Cloud computing helps reduce the number of people working in an organization	4.033	1.05	0.06
	Cloud computing reduces the cost of training personnel.	3.883	1.054	0.06
	Cloud computing reduces the cost of acquiring hardware, servers, and software.	3.87	1.077	0.061
	Cloud computing reduces the burden of hardware maintenance and software development.	3.837	1.06	0.061
Security	Cloud computing provides backup technology to solve the problems of corruption and data loss.	4.235	0.948	0.014
	Cloud computing provides high data security if security conditions are applied.	4.156	0.901	0.011
	Cloud computing ensures that data can be retrieved in the event of some problems with devices and equipment.	4.081	0.923	0.013
	Cloud computing involves encrypting some information and identifying available and unavailable data.	3.932	0.999	0.017
Overall average of the cloud computing variable		**4.008**	**0.550**	**0.031**

The small value of the general standard deviation of (0.550) indicates the lack of dispersion of the respondents' answers from the arithmetic mean, and the presence of compatibility and harmony between the responses and understanding and awareness of the paragraphs. The general standard error of (0.031) indicates high accuracy in the respondents' answers about the items.

Analysis and diagnosis of the dependent variable (Knowledge Sharing)

The approved variable (knowledge sharing) includes (12) items. The descriptive statistics (arithmetic mean, standard deviation and standard error) for the items of the adopted variable were as they appear in the table 3.

Table 3 Descriptive Statistics for the Dependent Variable (Knowledge Sharing)

Questions	Mean	Std. D.	Std. E. Mean
The institution provides an environment that encourages the sharing of ideas and knowledge between professors and others (such as students and the community).	4.137	0.904	0.012
The professors of the institution are keen to exchange knowledge among themselves.	4.007	0.943	0.014
The institution provides the professors with the requirements to carry out their duties in the field of knowledge sharing (such as libraries, devices ..)	3.977	0.982	0.016
The organization attaches importance to knowledge sharing through written instructions, procedures and policies.	3.961	0.966	0.015
The Foundation organizes scientific forums and symposia to improve the knowledge of professors and students and increase their research skills.	4.075	0.91	0.012
The institution provides an email to the professor as a user to exchange and share knowledge	4.114	0.972	0.015
The Foundation encourages the use of social media to exchange and share knowledge among professors, students and the community.	4.059	1.034	0.019
The Foundation publishes and distributes the knowledge and scientific research of the professors.	4.068	0.935	0.013
The institution provides sufficient financial resources allocated to programs to improve the level of knowledge.	3.88	1.033	0.019
The Foundation grants rewards and financial incentives to professors for their participation in international and national forums.	3.818	1.029	0.019
The institution sets the standard for knowledge sharing to evaluate the performance of the professor.	3.837	1.013	0.018
The Foundation seeks to conclude agreements with institutions and universities in the field of knowledge sharing.	4.127	0.946	0.014
The overall average of the knowledge sharing variable	**4.005**	**0.647**	**0.037**

The general arithmetic mean of knowledge sharing of (4.005) indicates that there is a positive acceptance by the respondents towards the adopted variable, because the arithmetic mean value is higher than the hypothetical mean whose value is (3), and the small general standard deviation of (0.647) indicates that the respondents' answers are not scattered about The arithmetic mean, and the presence of compatibility and harmony between the responses and the understanding and perception of the paragraphs. The general standard error of (0.037) indicates the accuracy of the respondents' answers about the items.

From the aforementioned, the following can be deduced:

- All results related to the descriptive statistics of the study dimensions and their variables have enjoyed clear consistency and consistency in the respondents' answers.

- There is homogeneity in the perception and understanding of the study dimensions and its variables paragraphs by the respondents.
- There is high accuracy in the respondents' answers to the study dimensions and variables paragraphs.

Test the study model and its hypotheses

For the purpose of identifying the nature of the relationship of the influence of independent variables (cloud computing) on the dependent variable (knowledge sharing) in the research organization. We will verify the validity of the hypothetical model of the study according to some of the statistical tools and methods that were chosen to conduct the analysis on the study variables, as follows:

Correlation analysis

To complement the descriptive and diagnostic processes based on the descriptive analysis data, the correlation relationships between the study variables were identified, as shown in the table below:

Table 4 Correlation coefficient between cloud computing and knowledge sharing

Independent / Dependent	Cloud Computing						Total
	Infrastructure	Software	Networking	Flexibility	Reduce costs	Security	
Knowledge Sharing	0.537**	0.593**	0.564**	0.696**	0.505**	0.635**	0.731**

**Correlation is significant at the 0.01 level. N=307

The table data 4 indicates that there are correlations between cloud computing and its dimensions (infrastructure, software, communication networks, flexibility, cost reduction, security) and knowledge sharing. Where all relationships were significant. This is evidenced by the values of the correlation coefficient shown in the above table at the level of significance (0.01).

These results reflect the fact that we accept the first main hypothesis, which states the following: There is a significant correlation between cloud computing and its dimensions (infrastructure, software, communication networks, flexibility, cost reduction, security) and knowledge sharing.

Analysis of the influence relationships between the study variables

Within the systematic treatment of our hypotheses, in the first axis, the correlation relationships between the study variables were completed. In this axis, we will address the influence relationships between the same dimensions according to the second main hypothesis and the sub-hypotheses emanating from it, and the test results will be presented as follows:

The relationship of the impact of cloud computing on knowledge sharing at the macro level

The content of this relationship represents a test of the second main study hypothesis which indicates that "there is a significant effect relationship of cloud computing in knowledge sharing".

The table 5 of the regression analysis indicates that there is a significant effect of cloud computing as an independent variable in sharing knowledge as a dependent variable. And that is according to the calculated (F) value whose value is (350.602) which is greater than its tabular value of (6.635) and it is significant at the level of (0.01) with two degrees of freedom (1, 305). (β_0) is significant at the level (0.01), and as long as the calculated (T) values are significant for all independent variables amounting to (18.724) which is greater than their tabular value (2.326), this reflects the significance of the model. It is clear that the coefficient of determination (R^2), whose value is (0.535), indicates that the ability of the independent variables together to explain approximately (54%) of the differences in the adopted dimension and that (46%) are due to variables not included in the model. Thus, the second main hypothesis is accepted.

Table 5 The relationship of the impact of cloud computing on knowledge sharing at the macro level

Independent / Dependent	Cloud Computing		F		T		R^2
	β_0	β_1	Calc.	Tab.	Calc.	Tab.	
Knowledge Sharing	0.557	0.860	350.602**	6.635	18.724**	2.326	0.535

**: $P \leq 0.01$ d.f : (1,305) N = 307

The relationship of the impact of each dimension of cloud computing on knowledge sharing

This axis focuses on the process of validating the sub-hypotheses emanating from the second main hypothesis to determine the impact of cloud computing dimensions on knowledge sharing. The following table shows the results of this axis.

Table 6 The relationship of the impact of cloud computing dimensions on knowledge sharing

Cloud computing dimensions	β_0	β_1	F		T		R^2
			Calc.	Tab.	Calc.	Tab.	
Infrastructure	1.696	0.580	123.717**	6.635	8.994**	2.326	0.195
Software	1.440	0.636	165.830**	6.635	12.878**	2.326	0.352
Networking	1.850	0.535	142.463**	6.635	11.936**	2.326	0.318
Flexibility	1.310	0.674	285.794**	6.635	16.905**	2.326	0.484
Cost reduction	2.408	0.409	104.315**	6.635	10.213**	2.326	0.255
Security	1.695	0.563	206.359**	6.635	14.365**	2.326	0.404

**: $P \leq 0.01$ d.f : (1,305) N = 307

The results above show that cloud computing and its dimensions have a significant impact on knowledge sharing.

From the foregoing, the results of the aforementioned hypotheses can deduce the clear impact of cloud computing on knowledge sharing, and this means that the surveyed universities' adoption of cloud computing would contribute to supporting knowledge sharing. Thus, this coincides with the progress of the study in the axis of the methodology and theoretical framework.

Conclusion

The literature and previous studies indicated that there is a dearth of studies related to cloud computing and its use in the educational process to share knowledge. To our knowledge, this study is the first exploratory study that uses cloud computing factors for knowledge sharing by educational institutions in Iraq. Cloud computing factors (infrastructure, software, communication networks, flexibility, cost reduction, security) were analyzed to determine their impact on knowledge sharing. The response was good from the faculty members in Iraqi universities, amounting to (307). The study succeeded in targeting most of the higher education institutions in Iraq, and we can easily generalize the results to them. And its data was analyzed using the program (SPSS V.24, Excel 2013). The results of the study showed that there is a significant effect relationship between cloud computing and its dimensions with knowledge sharing. Therefore, universities need to rely on cloud computing to share knowledge. The results will provide Iraqi universities with valuable insights into the critical factors influencing the adoption of cloud computing.

The results of the current study can contribute to directing the attention of workers in the educational sector towards the use of cloud computing applications to share knowledge in the educational process. The success of knowledge-sharing cloud computing depends on fast, reliable and highly available communication channels at an affordable price. Therefore, universities must improve the Internet infrastructure and develop more effective software that is automatically updated periodically to obtain data and information at any time and place, provide high availability of network service at a reasonable price, and store important data such as educational records or test scores by setting certain security and privacy conditions from Prior to the institution, enabling faculty members with training and workshops to bridge the information gap in cloud computing and knowledge sharing.

Limitation of study and future work

This study was limited to public universities and was a cross-sectional exploratory study. Thus, it is possible to conduct longitudinal studies that study the same community at frequent intervals

to better understand the shift in adoption of cloud computing and the change in the importance of specific factors, and the inclusion of private universities and their comparison with the government. It is also recommended to include additional factors necessary to improve and develop the study model by researchers in this field by adding more variables and dimensions that were not addressed in this study and because the use of other variables would give more feasible and desirable results for future studies.

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