

The impact of cloud computing on business quality and efficiency

Ahmed Najm Abdullah Saleh

ahmedphhd@gmail.com

Sunni Endowments Directorate in Anbar

ABSTRACT

Cloud computing is a paradigm shift in the world of modern technology, where cloud computing relies on the process of transferring processors and storage spaces related to the computer to what is known as the cloud, as it represents services that are carried out through hardware and software connected to a network of servers that carry their data in a virtual cloud that ensures their permanent connection without interruption with a number of devices such as computers, smart phones, etc.

Because of the rapid growth of information systems and the volume of data of individuals and institutions with the passage of time, it becomes difficult for institutions and individuals to keep pace with the inflation and development in the volume of their information and to meet the needs of users and institutions. Ease of use and storing large volumes of data and information for its users in a secure manner that has high privacy.

Where users of cloud computing are allowed to access it via the Internet from anywhere and at any time without the need for these users to have knowledge, experience or control over the infrastructure that supports these services, and it also provides these services on the principle of paying as much as you use.

Cloud computing is considered one of the most important modern strategic technologies that are developing rapidly and attracting many users and organizations.

Key words:Cloud computing, data and information preservation, land registration.

تأثير الحوسبة السحابية على جودة وكفاءة الأعمال

م.م احمد نجم عبدالله صالح

مديرية الوقف السني في الانبار

الملخص

الحوسبة السحابية هي نقلة نوعية في عالم التكنولوجيا الحديثة، حيث تعتمد الحوسبة السحابية على عملية نقل المعالجات ومساحات التخزين المتعلقة بالحاسوب إلى ما يعرف بالسحابة، حيث تمثل خدمات تتم من خلال أجهزة وبرامج متصلة بشبكة من الخوادم التي تحمل بياناتها في سحابة افتراضية تضمن لها اتصالاً دائماً دون انقطاع بعدد من الأجهزة مثل الحاسب الآلي والهواتف الذكية وغيرها. وبسبب النمو السريع لأنظمة المعلومات وحجم بيانات الأفراد والمؤسسات مع مرور الوقت، أصبح من الصعب على المؤسسات والأفراد مواكبة التضخم والتطور في حجم معلوماتهم وتلبية احتياجات المستخدمين والمؤسسات. سهولة الاستخدام وتخزين كميات كبيرة من البيانات والمعلومات لمستخدميها بطريقة آمنة تتمتع بخصوصية عالية. حيث يسمح لمستخدمي الحوسبة السحابية بالوصول إليها عبر الإنترنت من أي مكان وفي أي وقت دون الحاجة لهؤلاء المستخدمين إلى معرفة أو خبرة أو سيطرة على البنية التحتية التي تدعم هذه الخدمات، كما أنها تقدم هذه الخدمات على مبدأ الدفع بقدر ما تستخدم. تعتبر الحوسبة السحابية من أهم التقنيات الإستراتيجية الحديثة التي تتطور بشكل سريع وتجذب العديد من المستخدمين والمنظمات.

الكلمات المفتاحية: الحوسبة السحابية، حفظ البيانات والمعلومات، تسجيل الأراضي

The study Problem:

Land registration systems involve collecting details such as ownership and land size, and nowadays the traditional land registration process is cumbersome as it involves keeping large amounts of records in written form.

Study questions:

- 1- What are the benefits of using cloud computing?
- 2- What is the role of cloud computing and data and information storage in land registration?

3- What are the characteristics of the proposed electronic system for land registration?

Objectives of the study:

- Learn about cloud computing and its history.
- Proposing a new electronic system for land registration as an alternative to the traditional system
- Identify the advantages of the proposed new system.

The importance of studying:

- The need for a new land registry system.
- Creating a safe environment and easy access to land data and information.

The first topic: the concept of cloud computing and its history

The first requirement: the concept of cloud computing

Cloud computing is defined as "a technology that relies on transferring the processing and storage space of a computer to the so-called cloud, which is a server device that is accessed via the Internet."

In this way, information technology programs are transformed from products into services, as the cloud computing infrastructure relies on advanced data centers that provide huge storage spaces for users.¹.

The National Institute of Standards and Technology defines it as "a popular, convenient enabling model for on-demand network access to a shared set of computing resources that are configured such as networks, servers, storage, and applications, and can be quickly provisioned and launched with minimal administrative effort or interaction with a service provider."

It is also defined as the services that are carried out through devices and programs connected to a network of servers that carry their data in a virtual cloud that ensures their permanent and uninterrupted

¹Cloud computing: its concept and applications in the field of libraries and information centers, Sabah Muhammad Kalu, the twenty-first annual conference, Abu Dhabi, United Arab Emirates, March 17-19, 2015, p. 3

connection, with various other devices such as computers and smart phones, after setting a special code to unlock the network and thus accessing it from anywhere and at any time².

Tayseer Andrews Salim defined it as: "a term referring to computer resources and systems available on demand via the network, which can provide a number of integrated computer services without being restricted by resources in order to facilitate the user".³

Hussein and Al-Sumaidaie defined it as: "a new pay-as-you-go model for flexibly accessing hardware and software resources through the Internet and allowing companies to reduce costs and increase performance."⁴

The second requirement: the history of cloud computing

The history of the emergence of cloud computing dates back to the sixties of the last century, when the American computer scientist "John McCarthy" predicted that cloud computing would become over time a public service for all individuals, and the idea stemmed from the landline telephone network, but the actual application of cloud computing appeared with the beginnings of The year 2000, when Microsoft expanded the concept of using software through the web, followed by many companies after that, such as Google and Apple.

The first use of the concept of cloud computing in 1997 by Dr Ramnath k. Chellappa During a conference of the Institute of Operations Research and Management Sciences to point to a computing paradigm in which economic constraints are rather than technical constraints.

Where the actual real value of cloud computing lies in the process of decentralizing the computer and its various technologies, thus making it easier for users to access applications and data remotely, and thus

²Cloud Computing: Concept, Applications, and Benefiting From Them, Asmaa Bandar Saqir Al-Mutairi, Journal of the College of Arts, Part 2, Issue 47, 2018, p. 383

³The concept of cloud computing and its applications in libraries, Nadia Masoud Abu Al-Qasim Al-Fatoom, Maktabat Net, Volume 21, Issue 3, 2020, p. 9

⁴same reference

these individuals are less dependent on programs, applications, and the capabilities of the physical parts of their devices, relying more on the capabilities of the devices that make up this system.⁵

Cloud computing was developed in 1999sales forceBy introducing its online ordering website, Amazon also launched its first cloud and called it CloudAmazon Web ServicesWhere the cloud contains a group of cloud-based services, and in 2009 Google Cloud appeared, which is the most famous and largest in the world and provides many integrated computer services and non-compliance with local resources in order to facilitate users, and those resources include space for data storage, backup and self-synchronization, as well They include programming processing, task scheduling, and remote printing.⁶

Cloud computing represents the third revolution of technology after computers and the Internet, and cloud computing and cloud services are a big and important step towards the development of computing models and a great revolution in the provision of information technology services, and cloud computing is the last wave of the information age that began with mainframes, and we are now entering the latest Waves of information age cloud computing.⁷

The first requirement: the characteristics of cloud computing and justifications for its use.

Computational computing has a set of characteristics and these characteristics are:

1– Self-service on request:

⁵The impact of using cloud computing applications in teaching history on the development of classroom interactions and electronic communication among middle school students, Hadeer Mosaad Shafiq Al-Mahlawi, Master Thesis, Faculty of Education, Tanta University, 2017, pp. 21-22

⁶The concept of cloud computing and its applications in libraries, Nadia Masoud Abu Al-Qasim Al-Fatoum, p. 6

⁷Cloud Computing: Concept, Applications, and Benefit from Them, Asmaa Bandar Saqir Al-Mutairi, pp. 381-382

Where any user can benefit from the advantages of cloud computing anywhere and at any time without the need for a human factor

2– Broad network access:

The computing cloud has great capabilities that are widely available on the Internet, through mechanisms and standards that promote the use of heterogeneous user platforms such as mobile phones, laptops, and workstations.

3– Flexibility:

You can take advantage of the capabilities of cloud computing automatically by accepting the terms and adhering to them.

4– Combine and group resources:

The service provider works to provide services to its users by collecting virtual physical capabilities and integrating them in a coordinated manner.⁸

5– processing speed:

By accessing blazing-fast servers with a few cloud-based individuals

6– Flexible access from anywhere and at any time to the cloud and benefit from its services provided by those in charge of it.

7– Flexibility of choice and transfer from one provider to another without causing damage.

8– Unlimited storage capacity for computer clouds by relying on distributed servers.

9– The relative security of data that is stored on computer clouds, in the event of loss or damage to computer devices carrying user data, the data is safe.

10– Addressing emergency risks, as that task is transferred to the service provider.

⁸Secure Data Storage on Cloud Computing: An Evaluation Study, Nasser Abu Zaid Mahjoub Al-Kishki, Journal of Distance Education and Open Education, Volume 2, Issue 2, 2014, p. 83

11– Continuous modernization of the cloud by service providers, whether in infrastructure, software or servers.⁹

There are three basic aspects by which we can judge the success of any digital service, namely:

- Access the service via a browser.
- The beneficiary pays only for what he uses.
- No initial expenses are required to use the service.

All these aspects are available in cloud computing, along with the following advantages:

- The possibility of using one computer resource by more than one organization at the same time.
- It is compatible with the technologies available to each organization.
- Encourage teamwork and allow sharing with others.
- Storage as a global service, allowing everyone to store and use their files, no matter where they are.
- No need to update the software, as the software available via the cloud is instantly updated.
- Cloud computing is characterized by reliability, as the service provider is usually able to provide it and provide technical support permanently and continuously.¹⁰

Cloud computing is a new technological trend for the current and future generations, as it is the fertile environment and the platform on which the future of availability and access to information is built. Nothing, except that cloud computing technology provides huge capabilities for the process of storing information and providing protection for the security and privacy of information and data for users, in addition to that It provides an interactive, integrated and dynamic environment that

⁹Secure Data Storage on Cloud Computing: An Evaluation Study, Nasser Abu Zaid Mahjoub Al-Kishki, pp. 84-85

¹⁰Cloud computing software and its role in developing information services: an applied study on cloud storage sites on the Internet, Badawiya Muhammad Al-Basiouni, International Journal of Library and Information Sciences, Volume 2, Issue 3, 2015, p. 19

makes it easier for beneficiaries to work, exchange and share with others, as well as access to various information resources easily.¹¹

The second requirement: cloud computing policy and its benefits.

The cloud computing policy initially includes government agencies with the aim of accelerating the deployment of cloud computing services to government agencies when they take new decisions to invest in information technology, and this goal is achieved by assigning these agencies to consider cloud computing options first every time new decisions are taken to invest in Information Technology as appropriate and in line with governance, policy and operations guidelines as defined in the Cloud First Policy.

The objective of this policy is to seek to improve effectiveness and efficiency, reduce the total cost of ownership of government agencies, and enhance cyber security by adopting the correct cloud computing model for each of the objectives in line with data classification and protection systems. It also improves communication and communication between the participating entities and activates and enables operation.

Many leading countries have chosen to adopt a cloud computing policy first, which aims to achieve many goals, including:¹²

- Accelerate the adoption of cloud computing in the public sector:

By assigning government agencies to consider cloud computing options first for new investments in information technology, it is worth noting that the countries that adopted this policy witnessed a significant growth in the share of spending on cloud computing out of government spending on information technology.

- Overcoming the traditional government mentality:

¹¹Cloud Computing: A Future Necessity or a Temporary Dream?, Bin Dhaifallah Fouad, Iraqi Journal of Information Technology, Volume 9, Issue 1, 2018, p. 61

¹²Cloud Computing First Policy for the Kingdom of Saudi Arabia, Ministry of Communications and Information Technology, Kingdom of Saudi Arabia, February 2019, p. 10

Most government agencies in countries tend to prefer to deploy their own infrastructure and build their own applications, and this mentality will change after implementing the cloud computing policy first.

– Establishing an institutional framework for interoperability between agencies:

By enabling and enhancing communications and creating a collaborative nature between government agencies.¹³

The cloud computing service is focused on a group of elements that ensure the preservation of information, namely:

1– User data protection:

This element is based on the existence of a participatory relationship between the user and the service provider, as each of them has a very important role in this process. On the user's side, when carrying out any process of processing and storing information and data, he must ensure the quality of his Internet connection and that he has actually stored the file correctly on the network. And that his personal account data is not known to anyone else, and on the part of the service provider, he is keen to save user data and not leak it abroad.

2– Identity management system:

This system aims to verify the identity of individual users of cloud computing and to properly ascertain who is the real user of the account.

3– Physical security:

And it comes from the side of the service provider, so the service provider must ensure the quality of the network, applications and servers that it uses, and the absence of any security gaps in it, and it can always do this through a penetration test that examines all devices and their belongings in order to discover the weaknesses in them and

¹³Cloud Computing Policy First for the Kingdom of Saudi Arabia, Ministry of Communications and Information Technology, p. 11

discover the gaps Which can be exploited by individuals or gangs to seize user data.¹⁴

The third topic: the electronic system and land registration

The first requirement: land registration

Land plays a large and important role in sustainable economic growth, and achieving these goals requires setting policies that explicitly guarantee land and property rights at the top of the global agenda. Here are a number of reasons for that:

1– Secure land rights are an important pillar of agriculture:

With the increase in population growth and consumption, the global demand for food will continue to increase, and it is important to have a multifaceted methodology that guarantees sustainable food security, and this methodology must include interventions in order to increase agricultural yields by improving ways to guarantee land rights, and provide more agricultural inputs Recent research has shown that secure title deeds provide incentives for farmers to invest in land.

2– Secure land rights are essential to urban development:

The highest priority for African cities to provide a civilized environment with high levels of affordability and the ability to live a happy life is the formalization of land markets, the clarification of property rights, the development of effective planning and the adoption of a sound methodology.

3– Secure property rights and access to land are important for private sector development and job creation:

The private sector needs land to build buildings, factories, and residential real estate. According to a report evaluating the performance of the private sector in the Middle East and North Africa region, the biggest obstacles facing the private sector in the region include the

¹⁴Building cloud computing for Al-Neelain University and providing cloud storage service, Al-Amin Ahmed Mukhtar Al-Amin, Master Thesis, College of Computer Science and Information Technology, Khartoum, Sudan, 2015, pp. 32-33

difficulty of obtaining land, in addition to issues related to land ownership and registration.¹⁵

Most experts agree that land registration systems are essential in a developed market economy, where land is an essential resource that is used and exchanged more effectively when registering land rights, and a land registration system requires a comprehensive analysis of the necessity of land registration.

When addressing registration issues, consideration should be given to whether and when to establish a land registration system

Government officials must understand the prerequisites for a land registration system, as well as the potential advantages and disadvantages of such a system and potential sources of opposition to such a system.¹⁶

Land registry systems provide an important means of recognizing formal property rights. To regulate these rights, land records are documented, including information about the nature and spatial extent of these interests and the names of the persons to whom these interests relate. Property disputes In addition to information for a variety of functions, there are at least three basic types of land registry system:

- 1– Private transportation.
- 2– Registration of title deeds.
- 3– Property registration.¹⁷

What are the benefits of the land registry system?

The government guarantees the ownership of lands registered in the land registration system, the owner is registered by law.

¹⁵Source: <https://blogs.worldbank.org/ar/voices/7-reasons-land-and-property-rights-be-top-global-agenda>

¹⁶Designing Land Registration Systems for Developing Countries, Tim Hanstad, American university international law review, vo;.13, issue 3, 1998, p:649

¹⁷<https://academic.oup.com/book/40612/chapter-abstract/348231558?redirectedFrom=fulltext>

Under the land registration system, information is indexed according to the plots of land instead of the name of the owner. Linking land ownership and interests to a specific plot makes the search simpler and less prone to confusion and error.

The land registration system provides online links to land-related information, such as disabled town tax balances, which reduces the costs associated with distributing this information. The system will link all the land-related data needed to make all transactions simpler for everyone. Since land is the main driver in any economic market, This system will help improve the economy and benefit the entire population.¹⁸

For parcels registered under the Land Registration System, the government ensures that the person listed as the registered owner of the parcel of land is the person entitled to occupy and deal with the land, as the Land Registration System provides more certainty about other interests, such as:

- Easement rights.
- Rights of way.
- Well agreements.

That may affect every piece of land.¹⁹

Arrangements for independent oversight or land registry review differ in many countries. Periodic audits are conducted by an independent audit office or government agency. In others the responsibility rests with the courts, and in some cases the responsible ministry conducts audits or oversight of the operation of the land registry agency. It turns out that

¹⁸The Land Registration System How does it affect land owners?, Land Registration Service Nova Scotia and Municipal Relations, 2012, p:1

¹⁹The Land Registration System How does it affect land owners?, Land Registration Service Nova Scotia and Municipal Relations, 2012, p:3

the ideal model is for the administrative and financial audit to be outside the responsible ministry.²⁰

The second requirement: A proposed electronic system for land and investment registration

Ownership of land is considered one of the largest and most important assets for a citizen, so real estate registration is a process in which the ownership of a piece of land is recorded for its owner and registered. Human interaction and forgery in our world today has become a big problem facing any person, and at the present time the process of land registration in its traditional form is considered a cumbersome process that requires keeping a large number of records in written form, and the issue here is that the person needs to make a lot of effort to take various procedures than It wastes a lot of time, and the land registry system in its traditional form is not secure.²¹

This study presents a proposed electronic system for land registration using cloud computing, where the government must amend its policies to enable greater reliance on the electronic cloud, through:

- An enabling regulatory environment must be created that supports the adoption of cloud computing, which can include:

A- Limit the data localization policies that may be in place.

B- Implement a data classification framework that allows for better data management.

C- Create an interoperable cloud system for government.

- A solid cloud strategy and solid adoption plan must be in place.

²⁰Study on Key Aspects of Land Registration and Cadastral Legislation, Printed and published on behalf of UNECE Working Party on Land Administration by Her Majesty's Land Registry London, part1, 2000, p:14

²¹LandChain: A Blockchain Based Secured Land Registration System, Milon Biswas, and others, International Conference on Science & Contemporary Technologies (ICSCT) |, 2021, p:1

- Ensure the provision of internal support to guide government institutions in their journey to adopt the ELR policy.²²

Cloud architecture options for the proposed electronic land registry system provide a wide range of cost-effective options and improved business continuity, including:

- Flexibility.
- Reliability.²³

There are many problems and gaps facing the traditional system of land registration, which in turn creates an environment for corruption and conflicts. The proposed electronic system of land registration using cloud computing aims to reduce these problems and fill the gaps by creating an electronic system based on secure and easy-to-access records for landowners.

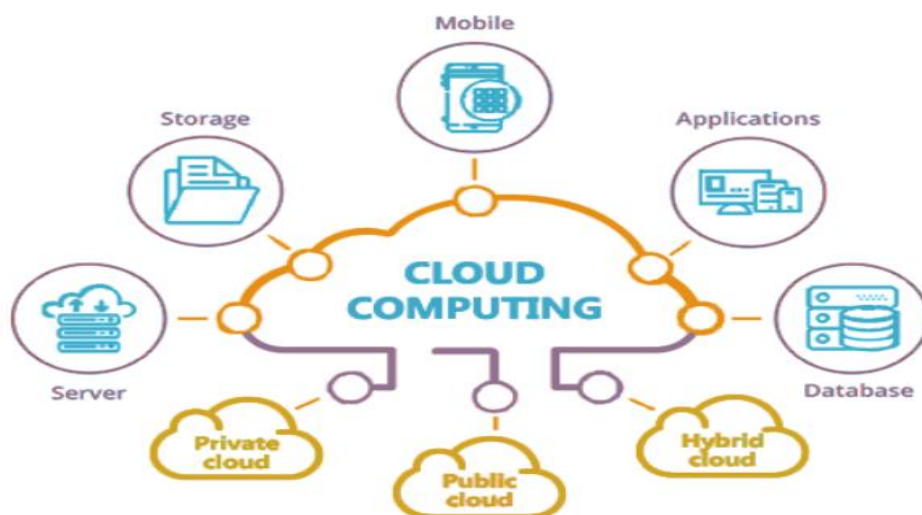
We called the new system of land registration, **Land electronic registration (LER)** This system is based on creating an electronic environment for land registration away from the problems of traditional land registration with regard to the large number of files and their preservation, as the electronic cloud provides a huge amount of storage space that ensures the ease of storing information about land owners and their property rights regarding their lands.

Cloud computing is an innovative and smart way to provide services and applications in a simple and easy way. It is also a solution to save the significant time spent on land registration in the traditional way.

Benefits of the proposed system:

²²CLOUD COMPUTING AS A KEY ENABLER FOR DIGITAL GOVERNMENT ACROSS ASIA AND THE PACIFIC, Thomas Abell, ADB SUSTAINABLE DEVELOPMENT WORKING PAPER SERIES, No.77, 2021, p:10

²³Landgate - Cloud Transition Case Study, government of western Australia department of the premier and cabinet office of digital government, p:3



1– Flexibility:

The electronic land registration system provides more flexibility in matching information technology resources that were based on past computing methods, and the mobility and movement of users can be increased by enabling access to their information about lands through the system's website, and this system provides greater ease and flexibility when performing various tasks.

2– Expandability:

Organizations that use cloud computing do not need to add hardware and software with higher standards and efficiencies when the number of users increases, and they do not have to buy more storage systems and routers. They can expand and develop by clicking on the boxes on the site of the proposed land registration system, as computerization ensures Cloud speed in joining and dealing with modern technologies on the Internet.

3– Sustainability

Many data centers lack efficiency and effectiveness due to poor design or ineffective use of assets, as cloud computing increases the efficiency of using computer resources and saves time spent on obtaining

electronic programs and services and provides access to services with great ease.²⁴

The proposed system facilitates the registration of the owner's data through the service website, submitting the application for the electronic registration of the land, and fulfilling the conditions on the site, which are as follows:

- Record the required data on the prepared form.
- Submission of the first documents with the validity of all data.
- The site shows a message to the owner with the order number, code and date.
- Once the required data is saved and all the conditions and its attachments are fulfilled, the application is submitted and the owner is awaiting the approval of the competent authority.
- Upon completion of the application, the applicant will be notified by text message.²⁵

The proposed system provides easy access to data and information on registered lands for the person authorized to access them, through the user name and password of each person.

Findings and Recommendations:

Findings:

The study reached the following results:

- 1- Cloud computing is characterized by a set of characteristics, the most important of which is the speed of data processing.
- 2- The traditional system of land registration contains loopholes and problems that waste time for users.

²⁴Cloud computing, Iyad Imad Ali, Department of Information and Communication Technology, Central Bank of Iraq, no date, pp. 12-14

²⁵ <https://www.elbalad.news/5225502>

3- The proposed electronic system for land registration is characterized by maintaining the privacy of data and information and securing them against theft and forgery.

4- The proposed electronic system for land registration is characterized by flexibility, the possibility of expansion, speed of data processing, and ease of access.

Recommendations:

1- Conducting more studies on land registration and the possibility of utilizing resources as much as possible.

2- Making continuous improvements to land registration systems to provide more time and speed in processing data and information to provide a safe environment.

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