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## Cloud computing and its impact on oil companies

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### Abstract

In light of the development witnessed by the oil sector and the entry of oil investment companies recently, and due to the need of local oil companies to use cloud computing technology appropriate information for users in light of technological development and modern communication systems, and the application of cloud computing technology reduces the cost of obtaining information from operating the accounting system in light Benefit And Cost Analysis, Decision rationalization provides information that can be used in making the decision to switch to cloud computing technology in the light of analyzing the benefits and costs, and that the application of cloud computing technology helps to provide a wide range of costs, which is to provide the benefit of optimal use of computer resources and human capabilities and help with accuracy and speed in data transfer And information between the company and its subsidiaries, and that the shift to cloud computing technology avoids the company's security risks and network information disasters and recover from them faster.

**Keywords:** Cloud computing, oil companies

### Introduction

The use of advanced computing technology leads to a continuous change in the technology of collection, processing and dissemination of accounting data and information, as fundamental changes occur to the traditional tools for dealing with data and accounting information, and thus contributes to raising the efficiency and operating capacity of the accounting system in processing data and obtaining accounting information, and is characterized by speed, objectivity and appropriateness. In order for this accounting information to perform the economic role assigned to it, this information must be economic. At the same time, it is of high quality, and this is not available unless there is a good information system based on the use of international accounting standards on the one hand, and the elements of communication and information technology on the other hand.

And the oil industry is one of the industries whose production passes through different stages, which are divided in Iraq in general into: A. Exploration activity, B. Drilling activity, C. extraction activity d. Transfer activity e. Liquidation activity f. Local distribution activity g. External marketing or export activity, These stages are characterized by overlapping, complexity, risk and uncertainty, and this industry needs a financial and financing policy of a special nature for its different stages, and in order for this accounting information of the oil companies to play the economic role assigned to it, this information must be economic, and at the same time be of high quality, and this does not It is available only with the presence of a good information system based on the use of international accounting standards on the one hand and the elements of communication and information technology on the other hand

### Research Methodology

#### 1. Research Importance

It is summarized in an attempt to scientifically root the economics of accounting information by comparing the benefits of that information with the cost of obtaining it, and thus demonstrating the effectiveness of using the decision to rationalize the transformation to use cloud computing technology to replace other electronic systems, to support the flexibility of processing and displaying information for oil companies, where the researcher suggests using cloud computing technology In light of studying the benefits and costs of this system.

**2. Research Problem**

The accounting information system is one of the open systems that always need to introduce developments to it by keeping up with the communication tools and networks (Internet, Intranet, and Extranet) surrounding the internal and external environment of the economic unit, so that the oil companies can carry out their activities and keep pace with the surrounding environmental changes, and therefore there is an imperative Because of the existence of a modern method that keeps pace with the network development, works to operate the system at the lowest cost to allow the exchange of accounting information between the oil companies and their branch to collect and send data and information.

**3- Research Objectives**

The current study aims to analyze the costs and benefits of using cloud computing technology in oil companies when switching from existing systems, and to explain the benefit and cost of rationalizing the decision to switch to cloud computing technology, while studying the risks and drawbacks of adopting cloud computing.

**4. Research Hypothesis**

The hypothesis of the research lies in the following:

- 1- (Accounting information operating systems provide appropriate information for oil companies in light of technological development and modern communication systems.).

**First: the technological vision of cloud computing”  
Cloud computing (concept, elements, challenges)**

**1.1 The concept of cloud computing**

It is a term given to the multiple concepts of accounts that take place between a large number of computers and smart devices around the world and in real time format through several types of networks, the most important and largest of which is the Internet. Scientifically, this term means distributed computing or distributed processing over networks, and more accurately means the ability of a program, application, or code to be executed on several computers of various equipment and capabilities simultaneously.

The term “cloud” came from the concept of cloud or cloud, which was expressed in network diagrams for the unknown or beyond. Where all network specialists know that all global network designs include a part known to the designer and user, which is the near part (LAN part), and another part that includes the far side of the network, which may include satellites or fiber optics lines or anything else. In short (WAN part), and because the Internet today as a network of networks is considered the greatest engineering structure in the history of mankind, and because no one in the world knows everything about it, how many computers it includes, and how all those smart and non-smart devices are connected, the specialists agreed to refer to what is behind a cloud:

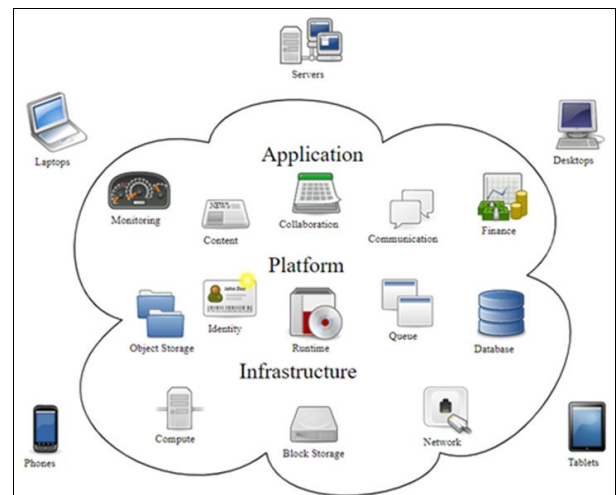
Although the term refers to the services provided by networks to their users in a way that suggests to the user that he is receiving the service from a real server (hardware server), the reality is that all or most of the services of these networks are provided by software servers (Software

Servers) that work on one real machine and these Flexibility is what gave cloud computing its reputation and its enormous capabilities to move and move freely from one place to another without the restrictions of (hardware).

**1.2 The main elements of cloud computing:**

1. A personal computer, which is any device with medium or below average capabilities, sufficient only to connect to the Internet.
2. 2-Any operating system that allows connection to the Internet Any system that can allow connection to the Internet, and this feature is available in almost all operating systems that currently exist.
3. Internet browser There is no requirement on the type of browser used in cloud computing, as long as the large sites are compatible with it, as it is suitable for using cloud computing without any obstacles.
4. Providing a connection to the Internet The Internet connection in this case must be of high speed, as it is the link between the user and all his data and all the programs he uses.
5. The cloud computing service provider in most of its characteristics is similar to the web hosting service provider, but with an increase in some characteristics in order to allow both developers and users to use the resources available in the servers with better efficiency, as the survival of both users and application developers will be longer on the servers of cloud computing service provider.

What are computer services



**An example of cloud computing in Application AS Services (AAS)**

1. Dealing with a financial system, salary system, banking system, or anything else via the Internet.
2. Creating a private communication network via the Internet, such as social networks and others.
3. Create a collaborative production system in software via the Internet.
4. Creating content and accessing content via the Internet, such as scientific content on a computer or others, or social content about a tribe or village, or political or religious content, or others.
5. Engineering control over the Internet or security control

(security control).

### **An example of cloud computing in Platforms As Service (PAS)**

1. Joint dealing with the database or renting the database.
2. Dealing with a specific program such as SPSS or other ready-made software packages, operating system software, computer programs or tools.
3. Dealing with a storage unit to store your information or data for any purpose, such as supporting storage, safe keeping, or storing some historical data because you cannot save all the data in your devices.
4. Identification or issuance of identity, such as a passport, and identity identification through the electronic card.

### **An example of cloud computing in Infrastructure AS Service**

1. Dealing with computer networks via the Internet.
2. Dealing with shared collective storage.
3. Private computer work.

### **In addition to examples of cloud computing**

- Operating System As Service (OAS)
- Software As Service (SAS)
- Printing As Service (PAS)
- Graphic As Service (GAS)

### **How is the service provided in terms of administration**

In agreement with the service provider in one of the following ways

1. By time (minute / hour / day / month) and by agreement we mean by time is the time used in fact and reality.
2. Job
3. For monthly, daily, or annual rent, or more than that, and here the rent is paid even if the service is not used.

### **1.3 Challenges of the cloud computing system**

The cloud computing system, which receives many requests from users, needs large storage spaces to ensure backup copies of the files used, as the main server of the cloud computing system intervenes in the event of malfunctions in the network devices and determines the server on which a backup copy of the client's files is located. The most important challenges are how to maintain the confidentiality of customer data because many large companies and institutions will not allow any party to view their databases, especially since dealing with the cloud computing system is through the Internet. Therefore, companies that provide cloud computing services are required to use secure systems that guarantee the privacy and confidentiality of customer data. The second challenge is the availability of appropriate applications for all institutions and the cost that must be less than the cost of using regular computer networks in companies and institutions

In the cloud computing system, computer users, whether individuals or users of local networks, rely less on applications and programs, as well as the capabilities of the HARDWARE existing in their devices, and instead rely on the capabilities of the devices that make up the cloud computing system all that individuals or employees in networks need is a computer connected to the Internet, regardless of the capabilities of this device in terms of

hardware and software, meaning that the work system will move from devices located in a specific place to other devices swimming in the Internet, hence the well-known name CLOUD COMPUTING.

**Second: the impact of the use of cloud computing in oil companies** (Oil industry, characteristics of the oil industry, costs of initiating the application of cloud computing, costs of applying cloud computing in oil companies)

#### **2.1 The oil industry**

Petroleum or crude oil (used in the same sense), is technically a mixture of heavy pentanes and hydrocarbons that are mainly extracted from oil reserves. (Revenue Watch, 2005: 32)<sup>[7]</sup>

The term petroleum is of Latin origin referring to crude oil and natural gas. The term oil is of Latin origin and consists of two parts, Petro, meaning rock, and Oleo, meaning oil, i.e. the oil that is extracted from the interior of the rock. (Dennis & Others, 2000: 9)<sup>[2]</sup>

Oil is generally called all hydrocarbon materials that are formed naturally, but in the commercial sense, liquid materials are called crude oil, gaseous materials natural gas, and solid materials bitumen, or asphalt (. Brady, 2011: 2)<sup>[1]</sup>.

#### **2.2 Characteristics of the petroleum industry**

The nature of the activities on which the oil industry is based results in accounting problems that make its treatment different from the treatments used in other branches of accounting. Below are the most important characteristics that distinguish this industry from others, which have direct accounting measurement and accounting principles appropriate for application in accordance with those characteristics. This does not mean that oil accounting adopts its own accounting principles and foundations other than the generally accepted accounting principles, but rather the difference is in the application and these characteristics. As shown by the following presentation:

1. **The magnitude of the invested funds:** The oil industry has unique characteristics that distinguish it from other mining industries in terms of the magnitude of the investments, as it is considered one of the capital-intensive industries that requires a large amount of financing. (Richard & Stewart, 2000: 499)
2. **The widening time gap:** One of the characteristics of the oil industry is that all the amounts that are spent in exploration and search for oil are done with the aim of achieving expected future revenues rather than present ones, which leads to the existence of a time dimension between the time of spending and achieving the revenue, and the revenues of selling oil to oil companies are recognized in cases (time Delivery, there is convincing evidence for sale, fixed or determinable fees) (Billson, 2010: 12)<sup>[4]</sup>
3. **Difficulty controlling research and exploration expenditures:** Given that the amounts that are spent in searching and exploring for oil in a particular region are difficult to predict, and it is also difficult to predict any revenues arising from those expenditures used in research, and given considerations of risk and uncertainty, any estimate of reserves is a questionable estimate. In his health, therefore, setting an estimated budget to evaluate oil exploration, and it is difficult to

control the expenses incurred by companies, even if they are related to oil reserves, as they are responsible for the difference in net income figures and the resulting cash flows. (Vitalone, James, 2009: 55)<sup>[3]</sup>

4. **High degree of risk and uncertainty:** uncertainty is one of the main characteristics of the accounting interview in the oil industry, and the fields of activities such as surveying, exploration, drilling, and estimating reserves and the quality of oil produced. (Jose Antonio, 2015: 1)<sup>[2]</sup>
5. **Access and the problem of diminishing assets:** due to the specificity of oil as one of the minerals, as it is a diminishing asset that ends with the passage of time (through continuous extraction), so the process of amortizing the costs of research and exploration is linked to time and to the quantities extracted during the different financial periods, and the process of amortizing the costs is done as capital costs by estimating the number of years Using crude oil reserves or estimating the total quantities discovered (i.e. its useful life). The amortization process is carried out by the ratio of costs to the useful life, and the costs of each fiscal year are charged with their share of the costs according to the rate of the extracted quantities. The amortization method for these costs depends on the accounting method used. (Al-Tamimi, 2014: 22)<sup>[5]</sup>
6. **The high level of technology:** The oil industry is characterized by the use of high technology, which is required by its complex technical operations, such as chemical engineering and automatic control, which requires high technical skills, which requires high investments to be employed to obtain advanced technology, and that the competition in diversifying and improving oil products requires an increase in specialized investments for research. Scientific use of electronic brains and equipment equipped with the latest devices to shorten the intermediate operations to the least possible extent and to be able to withstand the intense competition in the oil products market, which is characterized by renewal and continuous change, which requires that new products that enjoy technical and economic advantages outweigh those enjoyed by other products. displayed. (Al-Abedi, 2005: 32)

### 2.3 Start-up costs of cloud computing

These costs are represented in the cost of strategic decision-making, which means the decision that aims to change the company's long-term goals and the desired general shape of the company in the future (its size, competitive position, market share, etc.). (Saleh, 2009: 27)<sup>[9]</sup>

When the oil companies choose the cloud computing technology, its types, the nature of the programs that it uses, and the direct service that this technology is used to implement, it must take into account a set of costs, including the following: Aggrawal & MCabe, 2009: 16)<sup>[11]</sup>

1. The cost of analyzing the information technology infrastructure and business applications currently used in oil companies.
2. The cost of implementing the strategic decision and choosing the quality of cloud computing service, whether it is infrastructure as a service, platform as a service, or software as a service, or the cost of selecting

groups of computing technology to be used and the cost of choosing the cloud, whether it is a public cloud, a hybrid cloud, or a private cloud, according to the company's need.

3. Determine the cost of service requirements such as equipment installation costs, energy costs used, and maintenance costs.
4. Determine the costs of supporting the programming systems that are used with the applied technology that are chosen to work in the oil companies. These are the programming costs of the cloud computing systems related to the service provided.
5. Determining the costs of jobs provided by cloud computing technology to oil companies and their subsidiaries by determining the costs of computing systems represented by software technology.

### 2.4 Costs of applying cloud computing in oil companies

The costs of evaluating the cloud computing service provider in the oil companies are as follows: (Hong Li & Jeff, 2009: 2)<sup>[13]</sup>

1. The costs of searching for suppliers to provide the required service with the specifications, precautions and security considerations needed by the oil company to carry out service tasks in its various branches.
2. The costs of evaluating and analyzing different offers through features, functions and cloud computing services.
3. The costs of identifying and selecting the optimal alternative from one of the cloud systems by evaluating the supplier in terms of reputation, quality of service, and safety requirements such as network security and data recovery methods.
4. Calculating the cost of service fees, which vary according to the type of service and the supplier itself, and therefore attention must be paid to studying pricing plans.

### Relocation, arrangement, integration and migration costs include the following: (Mayank Yuvaraj, 2015: 568)<sup>[14]</sup>

1. The costs of implementing and arranging the cloud computing service in the oil companies, which includes the costs of using the access permission, which allows users of the company's clients to benefit from this service, whether for reasons of travel or tourism.
2. The costs of merging and integrating with other systems, whether that use cloud computing technology or non-cloud information systems, and include options for merging two or more clouds, such as a public cloud with a private cloud, in order to benefit from multiple services that can be provided by oil companies.
3. The costs of upgrading the system to higher levels with higher communication services through upgrading the data, programs and terminal entrances required by the beneficiary.

### Operating costs of cloud computing technology, including the following

1. The costs of supporting cloud computing technology after its application in the oil companies by supporting the means of communication with the subsidiary oil



- companies, whether by phone, e-mail or instant messages.
2. Training costs, whether at the beginning of using and applying cloud computing in the oil companies or after running the business through the process of internal training for employees or through external training by third parties, or conducting trainings for clients using the network who are selected from the major users of the services of oil companies and can be provided Training videos on social networking sites, or the company's website, to inform customers about the possibility of use in benefiting from the services provided.
  3. The costs of modifying the cloud computing service after its application to ensure continuous quality in order to increase the efficiency of the company's operations and to permanently improve the use of cloud computing services.
  4. Costs of reporting, performance and cost management, which means that it is a set of actions taken by managers with the aim of reducing costs and achieving customer satisfaction.
  5. The costs of evaluating the supplier's contractual obligations and the extent to which the agreed quality has been achieved.

**The costs of replacement and dispensing with the system are as follows: (Mayank Yuvaraj, 2015: 570)<sup>[14]</sup>**

1. System failure costs by calculating the cost of lost work time, contract fines and service delivery.
2. The outsourcing or exclusion costs of upgrading data from the cloud or the costs of restoring such data from backups.

**The reason for choosing this method to measure the cost of switching to cloud computing technology**

The justifications for using the engineering and value analysis method to measure the costs of switching to cloud computing technology are as follows: (Jasim, 2011: 195)

1. The multiplicity of alternatives to choose between multiple elements of the costs of cloud computing technology, whether it is related to replacement costs, acquisition costs, or operating costs, and that the multiplicity of choices comes from the diversity of alternatives to networks, devices, and computing systems, as it is reflected in the benefits compared to the costs of each alternative.
2. Trying to take advantage of this method when making the decision to replace the cloud computing system by studying suppliers' bids, evaluating the quality of computing companies' services, and indicating alternatives to programs and operating systems needed for the replacement process.
3. Benefiting from this method in planning the process of finding the best alternative for each part of the system to be converted to, after dividing that into initial costs spent upon replacement, and current operational costs spent during the operating period of the new system.

**Conclusions and Recommendations**

**Conclusions**

1. The oil production activity is characterized by risks and

uncertainty that had a clear impact on accounting applications in this field, so many policies appeared to address the costs of research and exploration, which led to conflicting opinions about the application of any of them in oil companies.

2. The proposed accounting policies for dealing with research and exploration costs are divided into two main groups, the first group is the total cost policy and the policy of successful efforts. Despite some criticisms directed at it, it is applied in all oil production companies. of criticism.
3. The application of cloud computing technology helps save a wide range of costs, which is represented by providing the benefit of optimal use of computer resources and human capabilities and helping to accurately and quickly transfer data and information between oil companies and their branches.
4. Cloud computing technology supports new areas to serve oil companies and is considered a justification for development and works towards continuous improvement of services in the company and reduces the cost of building systems and administrative burdens by saving time and effort.

**Recommendations**

1. need to use cost-benefit analysis in making the decision to switch to cloud computing technology in oil companies.
2. The need to involve employees in training courses to increase their skills and experience so that they can deal with cloud computing technology and modern technologies.
3. The need to use cloud computing technology because of its technical and economic benefits that bring savings to its users without the oil companies bearing the burden of owning this technology.
4. The need to benefit from the experiences of previous companies in the field of relying on cloud computing technology and keeping pace with technological development.

**Reference**

1. Brady, John Eats. Petroleum Accounting: Principles, Procedures, & Issues Pwc. Llp, 7th Ed. 2011.
2. Dennis, Joseph, Horace. Petroleum Accounting, Principles, Procedures, Issues, 5<sup>th</sup> Ed., 2000.
3. Vitalone, James, Accounting For difference in oil and Gas Accounting. The Association of Accountants and Financial Professionals In Business, 2009.
4. Billson Jo. Oil and Gas Accounting, Review Qatar development Banks Exporters, 2010.
5. Al-Tamimi, Firas Qassem Majeed. The Impact of the Costs of Oil Licensing Contracts on the Financial Statements of the South Oil Company in Light of International Standards for the Oil Industry," Unpublished Master's Thesis in Accounting, College of Administration and Economics, University of Basra, 2014.
6. Al-Abadi, Abdul-Razzaq Khader Hussein. The Role of Foreign Investments in Financing Oil Industry Projects - A Case Study in the North Oil Company," Master's Thesis, College of Administration and Economics,

- University of Mosul. 2005.
7. Revenue Watch. Oil Control, Open Society Institute, New York, Central European University Press, 2005.
  8. Raghad Hashim Jassim. The Contribution of Value Engineering to Reducing Costs on the Basis of Activities, Journal of the College of Education, Al-Mustansiriya University, Iraq. 2011;4:195.
  9. Samir About Fotouh Saleh. Decision Support Systems: Modern Technologies to Support Management in the Age of Knowledge, without a publisher, 2009, p. 27.
  10. Laila Naji Majeed. The Accounting Environment and its Adaptation Indicators for Information Technology, Baghdad University College Journal of Economic Sciences, College of Administration and Economics, University of Baghdad, Iraq, Special Conference Issue, 2013, p. 295.
  11. Aggrawal, MCabe. The Compelling TCO Case for Cloud Computing in SMB and Mid-Market Enterprises, A Hurwitz white Paper, 2009, p16.
  12. Becker, Beverungen & Matzner & Müller. Total Costs of Service Life: The Need of Decision Support in Selecting Comparing and Orchestrating Services, First International Conference on Exploring Services, 2010, p 285.
  13. Hong Li, Jeff Sedayao, Jay Hahn-Steichen. Developing an Enterprise Cloud1-Computing Strategy', Intel White Paper, Retrieved from, 2009, p. 2.
  14. Mayank Yuvaraj. Problems and prospects of Implementing Cloud Computing in1- University libraries, Library Review. 2015;64(8):568.
  15. Hong Li, Jeff Sedayao, Jay Hahn-Steichen. Op. Cit, p3.
  16. Drury C. Management and Cost Accounting, Thomson Learning, London, 6 Thud, 2004, p44.
  17. Mayank Yuvaraj. Problems and prospects of Implementing Cloud Computing in Op. Cit, 570.
  18. <http://ar.alison.com/courses/Introduction-to-Cloud-Computing>
  19. <http://www.aljazeera.net/news/scienceandtechnology/2014/12/10>
  20. <http://www.tech-wd.com/wd/tag>.