



## **Models of cloud computing services used in libraries and information centers**

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### **Abstract**

The increasing volume of intellectual production and the diversity of its subjects, sources and languages have led to the emergence of many problems facing researchers and information institutions. Perhaps the most important of these problems is related to the provision of storage space for information and the diversity of processing methods in addition to problems related to the flow of information and methods of benefit from it. The present research aimed at highlighting the concept of cloud computing and clarifying the nature of its services and the models used in libraries and information centers for both beneficiaries and researchers. In order to achieve the required results, the researcher will use the qualitative method through reference to various resources, including, books, articles, papers and theses related to the current research. The research concluded that cloud computing techniques are very useful for libraries and information centers, especially as they will help libraries save costs and provide new services. However, the number of libraries that benefit from cloud computing is still low. It is not easy to move to new technology with no trained people capable of dealing with these technologies, but in the near future we will find many libraries offering their services through cloud computing.

**Key words:** Models, cloud computing, services, libraries, information centers



## **1. Introduction**

With the development of available technologies through the web with the emergence of Web 2.0 and Web 3.0 and the steady increase in Internet speeds available to users, many organizations have made their applications available for use through the Internet in what is known as cloud computing. This technique has allowed for its users better features such as saving expenses or providing services to a larger segment of the beneficiaries.

Cloud computing technology provides the beneficiary and information institutions with the ability to store, process, transfer and share information from anywhere and at any time without the obligation to use the personal computer (Miseviciene et al., 2011). Cloud Computing is used in many applications, such as Google's e-mail service (Gmail, Yahoo Mail), various Google applications, Microsoft Office Internet applications, and Flickr photo applications that allow the user to keep and share their own image online with friends and family.

The term cloud computing began to be used in early 1990, where cloud computing was inspired by the cloud code, which is often used to represent the Internet in maps and graphs, as with many other new technologies, this means different things for different people (Horrigan, 2008). Libraries and information centers have not been able to benefit from these technologies. Libraries have become involved in computerization projects provided by some of the commercial and service establishments that specialize in libraries such as Dura Cloud Project (Kaushik and Kumar, 2013). The present research aims at highlighting the concept of cloud computing and clarifying the nature of its services and the models used in libraries and information centers for both beneficiaries and researchers.



## **1.0 Research problem**

The increasing volume of intellectual production and the diversity of its subjects, sources and languages have led to the emergence of many problems facing researchers and information institutions. Perhaps the most important of these problems is related to the provision of storage space for information and the diversity of processing methods in addition to problems related to the flow of information and methods of benefit from it. Therefore, the problem of the current paper can summarize in the following questions:

**What are the Models of cloud computing services used in libraries and information centers?**

## **2.0 Research importance**

The importance of the study is to enhance the intellectual results published in the field of cloud computing. The study will also present some of the global experiences of a number of libraries and information centers that have already benefited from cloud computing applications. The importance of the study also highlights in clarifying the number of applications that can benefit the beneficiary and libraries provided by a number of search engines.

## **3.0 Research methodology**

In order to achieve the required results, the researcher will use the qualitative method through reference to various resources, including, books, articles, papers and theses related to the current research.

## **4.0 Literature review**

### **4.1 Definitions of cloud computing**

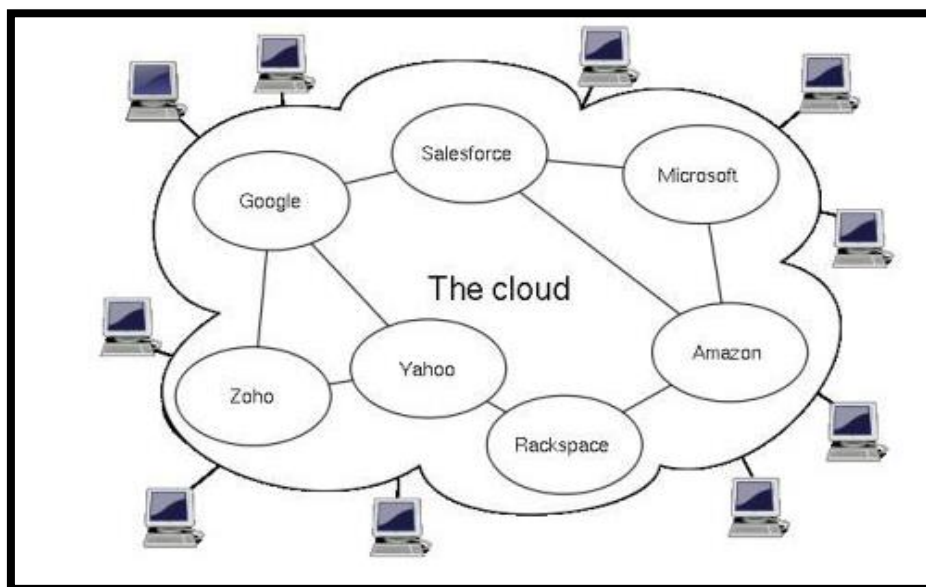
Cloud computing is a technology that relies on the transfer of processing and storage space of the computer to the so-called cloud, which is a server is accessed through the



Internet (Savatagi, 2017). This procedure includes transforming IT programs from products to services.

Cloud computing infrastructure is based on to advanced data centers, which provide large storage space for users and provide some software as services to users, and rely on the possibilities provided by Web 2.0 technologies (Yuvaraj, 2015).

Singh and Veralakshmi (2012) defined cloud computing as the web services that offer cheap, secure, on-demand platforms that can be accessed and used in easy ways. Cloud computing can also be viewed as a computing method in which computer resources are provided as services and are accessible to users via the Internet without the need to acquire the knowledge, experience or even control of the infrastructure that supports these services (Kaushik and Kumar, 2013). This can be illustrated by the following figure.

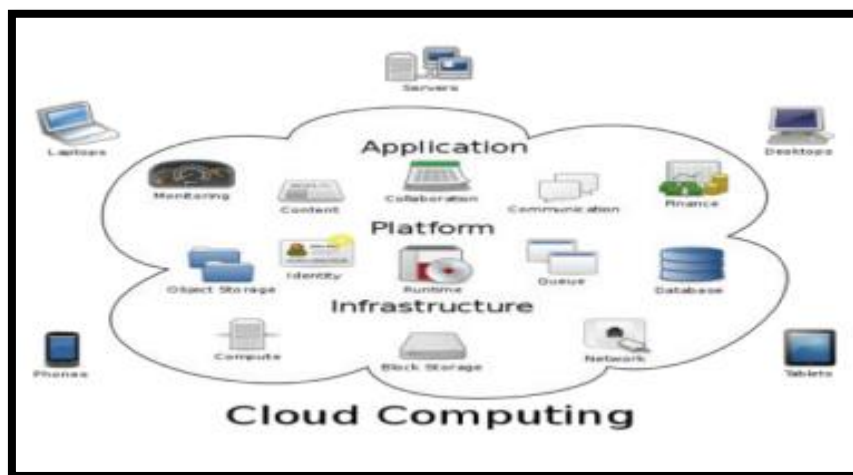


**Figure 1: Simplified explanation of cloud computing (Khafaja, 2010)**

Alotaibi (2013) clarified that dealing with cloud computing requires a set of element, including (see figure 2):



1. The beneficiary or customer who will use this technology and benefit from its services through the use of a ready-made personal computer or mobile phone connected to the Internet.
2. Platforms: represents the donors of the service.
3. Infrastructure: it is the structure upon which the service is based.
4. Applications: the applications that can be paralyzed by the user in the cloud, including word processing software, presentation and tables.



**Figure 2: Elements of cloud computing (Khafaja, 2010)**

The definition, which seems to be a combination of all elements, is the definition of the National Institute of Standards and Technology (NIST), which states that cloud computing is a model for enabling end-to-end access to the network on demand and sharing a set of accounting resources (applications, networks, and services) that can be deployed quickly and with minimal effort by management (Mell and Grance, 2017).

#### **4.2 The history and importance of cloud computing**



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The idea of cloud computing dates back to the 1960s, when John McCarthy expressed the idea that computing may be organized to become a public service one day. However, cloud applications did not actually emerge until the late 1990s and early 2000 when Microsoft expanded the concept of software use through the Web, followed by many companies (Alotaibi, 2013). But the most important companies that played an important role in the field of cloud computing is Google, which launched a number of services that rely on this technology (Khafaja, 2010). Google not only launched services to take advantage of this technology only; but launched in 2009 integrated operating system for computers works through the concept of cloud computing.

Cloud computing enables users to access their files and applications without having the application in their devices, thus reducing security risks, hardware resources, etc (Dhamdhare and Lihitkar, 2013). They are also used to perform complex operations that may require high-specification devices (Iwari and Hamzat, 2017). Khan et al. (2011) added that cloud computing also saves a lot of money to buy the software that a user needs. All he needs is a computer connected to a high-speed Internet and connected to a site that provides the software he needs. On the other hand, cloud computing provides easy access to the applications available through any computer connected to the Internet (Yuvaraj, 2015).

### **5.3 Models of cloud computing services**

There are many cloud services available on the Internet. The current section aims to refer to a number of these models that are suitable for the nature of the services provided by libraries and information centers. They also provide good benefits and services to users, as well as free services that do not require the user any financial costs. These services include:

1. **Google Cloud Drive:** it is one of Google's most recent cloud services, which has gained global resonance and wide application by researchers and



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information organizations (Khan et al., 2011). This service was introduced in April 2012, allowing users to store their various files on Google's main servers. Through this the user can access the files, modify, add to it and make various adjustments at any time and place and through the Internet (Kaushik and Kumar, 2013). Google also provides security and privacy for this data, which can only be accessed by its owner.

Google Drive has many features, including (Khafaja, 2010):

- A. It is a unique cloud service that is a subsidiary of a global company with a reputation in the Internet.
- B. The company provides the user with the ability to store private files by providing storage capacity.
- C. The great power that Google servers have.
- D. Integrate Google service with other Google services.
- E. Availability of many services such as storage, sharing, and loading.
- F. The possibility of sharing work by establishing groups.

2. **Google Scholar Services:** where they include two of cloud services:

- A. Publisher Support Service: a service that promotes easy access to digital content published in various scientific disciplines and from around the world. This service reviews scientific information for research, dissertations, drafts and abstracts from all disciplines and makes them searchable on Google (Khafaja, 2010).
- B. Google Scholar Citations: This service provides authors with a simple way to track citations related to their articles, and enables them to verify and calculate these citations using scales and graphs. It also enables researchers to present their intellectual findings to the public by searching for the researcher's name, and adding collections of related articles (Khafaja, 2010).



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3. **Research Gate:** The idea of this network was founded in 2008 by doctors and the computer scientist Horst. Five years later, more than 4 million researchers from 192 countries have become users (Ning, 2011). This portal is a social networking website and a free collaboration tool for scientific researchers from all disciplines.
4. **Drop Box:** it is an external site hosting files and has many benefits and advantages, and works to provide services to the cloud of the user on the Internet allows him to freely store files. This allowed space can also be used as any normal folder on the same user's computer. This service has many features, including (Yuvaraj and Singh, 2012 ):
  - A. Enables users to view, browse and modify their files from anywhere and in any geographic location.
  - B. Save files for fear of loss, loss or damage.
  - C. Let the user take pictures.
  - D. Supports Arabic language files and other languages.

## **6. Conclusion**

This technology has provided its users with many additional features, including: saving expenses and providing information services to a larger sector of beneficiaries. It also provides the beneficiary and information institutions with the possibility of storing, processing, transferring and sharing information anywhere, at any time and without obligation to use the personal computer. Libraries and information centers have not been able to benefit from these technologies, many of whom have opted to participate in computing projects that have been made available through some of the institutions that specialize in libraries.

Cloud computing techniques are very useful for libraries and information centers, especially as they will help libraries save costs and provide new services. However,





the number of libraries that benefit from cloud computing is still low. It is not easy to move to new technology with no trained people capable of dealing with these technologies, but in the near future we will find many libraries offering their services through cloud computing.

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