The Use of Cloud Computing to Process Big Data: An Applied Study of the Virtual Library at the University of Mosul

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Abstract. Several issues have arisen for investigators and informational establishments as a result of the ever-increasing amount of creative work and the wide variety of its themes, resources, and dialects. In addition to difficulties with knowledge transfer and ways to get value for all of this, there are other issues associated with the supply of storing place for knowledge and the variety of processed technology. The current study set out to gain insight on virtualization, elucidating its core concepts and the offerings it offers and the concepts it has inspired in academic libraries as well as data commons for the benefit of scholars and users alike. The researcher will employ the qualitative approach by drawing from a wide range of relevant sources, such as textbooks, papers, dissertations, and academic papers, to provide the necessary findings. The study found that informational facilities and librarians may benefit greatly from cloud applications because of the expense savings and expansion of activities they can also provide. Virtualization has several advantages, but only a small percentage of institutions have adopted them. It's challenging to adopt cutting-edge tech when there aren't enough educated personnel to manage it, however, in the not-too-distant era, many institutions will provide their services using drop box.

Keywords: Models, cloud computing, services, libraries, information center

1. Introduction

Several businesses just provide their products and services via the connectivity in what is termed as "cloud computing," because to the proliferation of web-based innovations like Web 2.0 and Web 3.0 and the continual improvement in Internet bandwidth where the customers can access them. The generates a range made possible by this method include cost savings and the ability to reach more people in need. Individuals and educational institutes can now access, manage, and collaborate on data instead of being tethered to a local machine, all thanks to virtualization [1]. Some popular services utilize web processing, including e-mail (Google Mail, Yahoo Mail), productivity (Google Docs, Microsoft Office Online), and picture management [2].

In the early 1990s, individuals started using the phrase "cloud computing," which was motivated by the virtualized pattern, that's frequently employed to depict the Network in graphical representations. But, similar to numerous other emerging innovations, "virtualization" may mean various distinct things to various individuals [3]. Until now, technological advancements haven't really benefited librarians and other informational hubs. Many library-centric businesses and telecommunications companies, including Dura Cloud Program, have initiated library-wide automatization initiatives [4]. All these users and scholars may benefit from this study's efforts to bring attention to cloud computing and to demystify its products and the approaches used by informational agencies along with libraries.

1.1 Research Problem

Several issues have arisen for investigators and informational providers as a result of the ever-increasing amount of creative works and the wide variety of its themes, resources, and dialects. In furtherance of challenges with data exchange and ways to get value from that, there are other issues associated with the supply of data storing for knowledge and the variety of techniques. That being said, the issue at hand may be reduced to the preceding queries:

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

1.2 Research importance

The study's significance lies in the fact that it will improve the conceptual achievements that have been produced in the area of cloud computing. The research will also offer the worldwide perspectives of such research providers and librarians which has previously profited using technologies that utilize internet computing. This study's significance lies in the information it sheds on how many helpful apps and resources may be accessed through different searching platforms.

1.3 Research methodology

The researcher will employ the qualitative approach by drawing from a wide range of relevant sources, such as textbooks, journals, dissertations, and academic papers, to provide the necessary findings.

2. Literature review

2.1 Definitions of cloud computing

The term "cloud computing" refers to a method of outsourcing a smartphone's computation and memory needs to an external server that users may connect to using the internet [5]. Procedures like moving IT software from the market to subcategory are a part of this process. According to Singh and Veralakshmi (2012), "cloud computing" refers to a set of digital websites that provide users with low-cost, high-security, on-demand infrastructures in simple of using formats. One definition of virtualization is a model for delivering shared computational capabilities via the Web as a company, with little to no emphasis on the user having to learn about, or have any accessibility to, the underlying network hardware and software [6]. The next diagram shows an example of this.
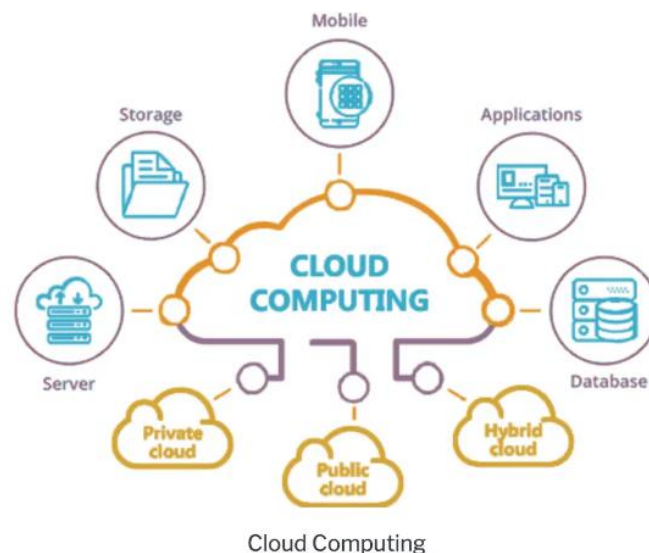

Figure 1: Simplified explanation of cloud computing

Alotaibi (2013) established the components necessary for interacting with cloud computing (see figure 2):

1. One who stands to gain by modern technologies and its capabilities by using a pre-assembled desktop or cellular devices with Network connectivity.

2. The term "platforms," which stands for the agency's financial backers, is the second term.

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3. Thirdly, the program's underlying configuration serves as the basis that supports how the company operates.

4. Applications: subscriber cloud-based apps include desktop publishing, slideshow makers, and database managers.
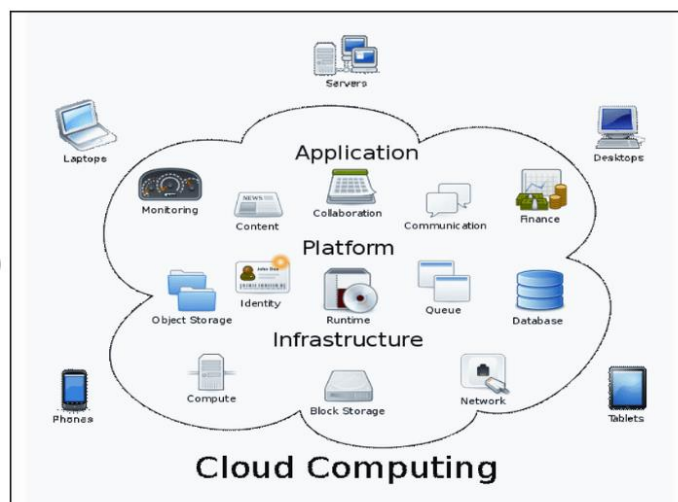

Figure 2: Elements of cloud computing (Khafaja, 2010)

The National Bureau of Standards and Technology (NIST) describes clouds as "a framework for empowering later part internet connection on consumption and expressing a range of financial assets (software solutions, connections, and facilities) that can be implemented rapidly with a minimum of underlying infrastructure and increasing at a rate." It appears to encompass everything [7].

2.2 The Impact of Cloud Computing on Data Centers

Cloud computing has had a major impact on the backbone of today's most important networking. Storage and networking architecture has become redundant in virtualization. Due to the commoditization of computing made possible by cloud platforms, memory, including networking devices, super web servers have emerged. The software companies typically will own manage these storage systems. Devices like this are more cost-effective than with those offered by traditional system architecture. In the past, storage facilities relied heavily on the operators of underlying information systems to provide both bandwidth and power for their facilities. In the present age of virtualized, it's impossible to do so. The combination of Storage Area Networks with Cloud computing, however, may lead to remarkable results. Understanding the role of the digital server in virtualization constitutes the fundamental step[8].

Also with advent of cloud computing, communication networking monitoring has advanced tremendously. Implementing cloud - based applications has some many advantages, but flexibility, adaptability, and cost-effectiveness come among the most significant. Agility is the capacity to respond rapidly to changing requirements in the business environment. The capacity for scaling up or down in response to fluctuating demand. Competent people make the most of the resources at their disposal. The system's advantages are substantial since it streamlines and broadens how businesses manage their broadband services[9].

With virtualization, data centers not only store and manage data but also provide the necessary computer resources for running applications. This entails not only keeping tabs on and backing up the data, but also offering a physical location and power for the gear. Organizations may boost efficiency, adaptability, and safety by integrating data centers into overall virtualization strategies.

When it comes to running their apps, companies rely heavily upon that computational and memory capability provided by data facilities, making them an integral aspect of virtualization. All three types of cloud infrastructure—public, corporate, and hybrid—can be hosted in a network infrastructure[10]. A cloud computing is a situation where a supplier is responsible for managing as well as making accessible the server farm. With a cloud architecture, all components are controlled and managed by the same company to fulfill its own purposes. A cloud computing system is created when several processors work together.

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and regional institution industries due to its flexible blended, throughout, and totally online delivery channels for domain classes. Browse through our selection of cutting-edge studies in information science!! Management and oversight of data center infrastructure. Equipment for surveillance and administration is heavily used in today's server farms. With the rise of virtualization comes a new set of difficulties for those in charge of maintaining physical data centers. Virtualization technology now allows for the abstracting and pooling altogether of computers, networks, and repositories irrespective of their exact placements [11].

Intervention The popularity of application computer servers may be attributed to the ease with which networking, memory, and servers can sometimes be virtualized. Using these shared resources, managers may spin up new working processes, memory volumes, and after that even infrastructure components. The management may return such goods to the community after they become no longer needed [12].

3. The History and Importance of Cloud Computing

John McCarthy first proposed the concept of the cloud in the 1960s, speculating that computing might one day be arranged to function as a public service. Yet, it was not until Microsoft broadened the idea of using software through the Web in the late 1990s and early 2000s that cloud applications truly began to take off [13]. Google, however, has released several services built on top of this innovation, the most significant company that played a significant role in the field of cloud computing [14]. In addition to launching services specifically to benefit from this technology, in 2009, Google also introduced a unified software and application platform that facilitates use of web applications.

When it comes to protection and technology resources, virtualization is advantageous since it enables users to access their data and programmed need downloading those on their gadgets [15]. They're also used to do complex operations that would need specialized gear [4. The expense of purchasing the required equipment may be reduced by utilizing the clouds, as stated by Khan et al. (2011)[18]. He needs merely a desktop that has broadband Online and accessibility to a webpage from which he may download the new drivers. Yet, cloud computing makes it simple to use the programmed accessible through any Internet-connected device [19]. Cloud computing first appeared in the 1960s.

3.1 Models of cloud computing services

On the Internet, Many data streams may be found on the web. The objective of this subsection is to examine several of these concepts that are well-suited to the informational facilities supplied by librarianship and other similar institutions. Moreover, they give clients with beneficial perks and amenities, along with complimentary goods and assistance. They include, among others:

1. Google Cloud Drive: It's among Google's newest web platforms, and it has already received widespread attention and use from academics and educational institutions throughout the world. [19]. [20]. Users can now store a variety of files on Google's primary servers thanks to this service, which was released in April 2012. This makes it possible to have the contents at their fingertips to, modify things, add into companions, and conduct other alterations from any place that has device with a Web connection location on the Network [21]. Search engine also ensures the confidentiality of this knowledge, making it accessible to solely the account holder.

Many features of Google Drive include [18]:

A. It is a distinct cloud service offered by a multinational corporation with a strong web reputation.

B. By providing storage space, the corporation gives the consumer the option to save private files.

C. The tremendous strength of Google's infrastructure.

D. Connect Google services with one another.

E. Availability of a wide range of services, including loading, sharing, and storage.

F. The potential for group collaboration on projects.

2. Google Scholar Services: If two data streams are involved

A. Publisher Support Service: a provision that encourages quick admittance to digital knowledge that has been published globally and across many scientific areas. This tool evaluates scientific data for dissertations, research papers, draughts, and Google-searchable articles from every discipline [18].

B. Google Scholar Citations: With the use of scales and graphs, this tool gives authors an easy way to keep track of citations that relate to their works and to compute those citations. By searching of the author's identify and the addition of bibliographies of related works it also helps researchers to communicate their intellectual discoveries to the general audience [18].

3. Research Gate: Medical professionals and computer scientist Horst came up with the concept for this network in 2008. More than 4 million researchers from 192 nations are now subscribers, five years later [20]. Researchers from various fields of science can collaborate for free on this portal's social networking site.

4. Drop Box: It also works to offer services to the user's cloud on the Internet, enabling him to keep files freely. This allotted space can also be utilized as any standard folder on the same user's PC. Several features of this service include [20].

A. Allows workers to access their files from anytime and in any location to read, browse, and edit them.

B. Enables users to access their files from anytime and in any location to read, browse, and edit them.

C. Let the worker to snap photos.

D. Handles Arabic language records as well as additional tongues.

4. Conclusion

Many additional capabilities have been made available to users of this technology, such as cost savings and making available knowledge resources to more people. This even frees the receiver and the communication organization from being tied to a machine at all times so that data may be stored, processed, transferred, and shared at will. Several digital librarians have opted out of using these capabilities in favor of participating in technology programs freely affordable by specialized library organization. Institutions of higher learning may benefit greatly from adopting cloud-based technology, since doing so can help them save money and develop innovative new programs.

Yet, only a small fraction of institutions can really make use of cloud processing. Several libraries will soon begin offering their services through cloud computing, despite the fact that it can be challenging to adapt new technology when there isn't qualified staff accessible to use it.

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