The Role of the Cloud Computing in Digital Transformation: An Analysis

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ABSTRACT

Cloud computing is the delivery of the different services through the internet. The Paper enhances the different services through the Internet, including data storage, servers, databases, networking, and software. It highlights the uploading data files and images over the centers available for users over the Internet. The Paper highlights storage, databases, networking, software, analytics, and intelligence over the Internet to offer faster innovation, flexible resources, and economies of scale. It explores the software and hardware-based computing resources delivered as a networked service. It means running fewer processes in the cloud and moving those processes to local places, such as on a user's computer or an edge server.

Key words: cloud, computing, data, application, system, information, monitoring, solutions and network

INTRODUCTION

Cloud computing is a revolutionary technology that allows individuals and businesses to access a vast array of computing services via the Internet. Information Technology is changing rapidly. Power grids, traffic control healthcare, water supplies, food and energy, along with most of the world's financial transactions, now depend on information technology. Thus it forms an invisible layer that increasingly touches every aspect of our lives. Some of the companies researching cloud computing are big names in the computer industry. Microsoft, IBM, and Google are investing millions of dollars into research. The cloud computing model offers customers greater flexibility and scalability compared to traditional on-premises infrastructure. It is an extension of cloud computing, and differs in terms of time taken in processing the information.

Cloud computing is an emerging IT delivery model that can significantly reduce IT costs and complexities while improving workload optimization and service delivery. Clod computing is massively scalable, provides a superior user experience, and is characterized by new, internet-driven economics. Cloud computing clod changes the entire computer industry. The present method of installing a suite of software for each computer can be replaced with having to load only one application. That application would allow workers to log into a Web-based service which hosts all the programs the user would need for his or her job. Remote machines owned by another company would run everything from e-mail to word processing to complex data analysis programs.

In a clod computing system, there is significant workload shift. Instead of local computers. The networks of computers that make up the cloud do all the heavy lifting when it comes to running applications. This result in decrease of hardware and software demands on the user's side. The only thing the user's computer needs to be able to run is the cloud computing systems interface software. Which can be as simple as a Web browser, and the cloud's network takes care of rest. Web-based e-mail service like Hotmail, Yahoo! Mail or Gmail do not run an e-mail program on your computer. You log in to a Web e-mail account remotely. The software and storage for your account does not exist on your computer but on the service's computer cloud.

Although cloud computing is an emerging field, the idea has been around for few years. It is called cloud computing because the data and application exist on a 'cloud' of Web servers. A cloud computing system can be divided into two sections: the front end and back end. They connect to each other through a network, usually the Internet. The front end is the side the computer user, or client, sees. It includes the client's computer (or computer network) and the application required to access the cloud computing system.

The back end is the 'cloud' section of the system. Various computers, servers and data storage system that create the' cloud' of computing services are present here. In theory, a cloud computing system could include practically any computer program you can imagine, from data processing to video games. Usually, each application will have its own dedicated server. A central server administers the system, monitoring traffic and client demands to ensure everything runs smoothly. It follows a set of rules called protocols and uses a special kind of software called middleware. Middleware allows networked computers to communicate with each other.

If a cloud computing company has a lot of clients, there is likely to be a high demand for a lot of storage space. Some companies require hundred of digital storage devices. Cloud computing system need a least twice the number of storage devices it requires to keep all it client's information stored. That is because these devices, like all computers, occasionally break down. A cloud computing system must make a copy of all its clients' information and store it on other devices. The copies enable the central server to access back up machines to retrieve data that otherwise would be unreachable. Making copies of data as a backup is called redundancy. The applications of cloud computing are practically limitless. With the right middleware, a cloud computing system could execute all the programs a normal computer could run. Potentially, everything from generic word processing software to customized computer programs designed for a specific company could work on a cloud computing system.

Cloud computing poses privacy concerns because the service provider can access the data that is in the cloud at any time. It could accidentally or deliberately alter or delete information. Many cloud providers can share information with third parties if necessary for purposes of law and order without a warrant. That is permitted in their privacy policies, which users must agree to before they start using cloud services. Solutions to privacy include policy and legislation as well as end-users' choices for how data is stored. Users can encrypt data that is processed or stored within the cloud to prevent unauthorized access. Identity management systems can also provide practical solutions to privacy concerns in cloud computing. These systems distinguish between authorized and unauthorized users and determine the amount of data that is accessible to each entity. The systems work by creating and describing identities, recording activities, and getting rid of unused identities.

It is a good idea to rely on anther computer system to run programs and store data as it would enable clients to access their applications and data from anywhere at any time. They could access the cloud computing system using any computer linked to the Internet. Data would not be confined to a hard drive on one user's computer or even a corporation's internal network. Also, it could bring hardware costs down as the client would not need to buy the fastest computer with the most memory, because the cloud system would take care of the rest. Instead, a client could buy an inexpensive computer terminal with a monitor, a keyboard and mouse and just enough processing power to run the middleware necessary to connect to the cloud system. "The provider must ensure that their infrastructure is secure and that their clients' data and applications are protected, while the user must take measures to fortify their application and use strong passwords and authentication measures" (Tozzi, C. 2017).

Hybrid cloud is a composition of a public cloud and a private environment, such as a private cloud or on-premises resources, that remain distinct entities but are bound together, offering the benefits of multiple deployment models. Hybrid cloud can also mean the ability to connect collocation, managed and/or dedicated services with cloud resources "Cloud computing and storage provide users with the capabilities to store and process their data in third-party data centers." (Abdel-Mottaleb, Mohamed(2015) A hybrid cloud service crosses isolation and provider boundaries so that it can't be simply put in one category of private, public, or community cloud service. It allows one to extend either the capacity or the capability of a cloud service, by aggregation, integration or customization with another cloud service.

If the cloud computing system's back end is a grid computing system, then the client could take advantage of the entire network's processing power. Often, scientists and researchers work with calculations so complex that it would take years for individual computers to complete them. On a grid computing system, the client could send the calculation to the cloud for processing. The cloud system would tap into the processing power of all available computers on the back end, significantly speeding up the calculation.

While the cloud computing system's back end is a grid computing system, then the client could take advantage of the entire network's processing power. Often, scientists and researchers work with calculations so complex that it would take years for individual computers to complete them. On a grid computing system, the client could send the calculation to the cloud for processing. The cloud system would tap into the processing power of all available computers on the back end, significantly speeding up the calculation.

While the benefits of cloud computing seem convincing, security and privacy are perhaps its biggest concerns. The idea of handing over important data to another company worries some people. Corporate executives might hesitate to take advantage of a cloud computing system because it would not allow them to keep their company's information under lock and key. " in order to conserve resources, cut costs, and maintain efficiency, cloud service providers often store more than one customer's data on the same server. As a result, there is a chance that one user's private data can be viewed by other users (possibly even competitors). To handle such sensitive situations, cloud service providers should

ensure proper data isolation and logical storage segregation" (Srinivasan, Madhan Kumar; M. Sai; Revathy, P. 2012:471) The counterargument to this position is that the companies offering cloud computing services live and die by their reputations. It benefits these companies to have reliable security measures in place. Otherwise, the service would lose all its clients. Hence, it's in their interest to employ the most advanced techniques to protect their clients' data.

Cloud computing companies will need to find ways to protect client privacy. One way is to use authentication techniques such as user names and password. Another is to employ an authorization format whereby each user can access only the data and applications relevant to his or her job. Then there are a few standard hacker tricks that could cause major problems to cloud computing companies. "One of those is called key logging. Security controls and services do exist for the cloud but as with any security system they are not guaranteed to succeed. Furthermore, some risks extend beyond asset security and may involve issues in productivity and even privacy as well" (Carroll, Mariana; Kotzé, Paula 2011:9)

A key logging program records keystrokes. If a hacker manages successfully to load a key logging program on a victim's computer, he or she can study the keystrokes to discover user names and passwords. Of course, if the user's computer is just a streamlined terminal, it might be impossible to install the program in the first place.

"Illegal invasion, and denial of service attacks, but also specific cloud computing threats, such as side channel attacks, virtualization vulnerabilities, and abuse of cloud services. In order to mitigate these threats security controls often rely on monitoring the three areas of the CIA triad. The CIA Triad refers to confidentiality (including access controllability which can be further understood from the following., integrity and availability." (Tang, Jun; Cui, Yong; Buyya, Rajkumar 2016:39) However, the complexity of security is greatly increased when data is distributed over a wider area or over a greater number of devices, as well as in multi-tenant systems shared by unrelated users. In addition, user access to security audit logs may be difficult or impossible. Private cloud installations are in part motivated by users' desire to retain control over the infrastructure and avoid losing control of information security.

There is a growing concern in the IT industry about how cloud computing could impact the business of computer maintenance and repair. If companies switch to using streamlined computer systems, they will have fewer IT needs. Some industry experts believe that the need for IT jobs will migrate to the back end of the cloud computing system. It is an extension of cloud computing, and differs in terms of time taken in processing the information.

CONCLUSION

Cloud Computing delivers computing services over internet, including servers, storage, and software, on a pay-as-you-go basis. Cloud computing is beneficial to many enterprises; it lowers costs and allows them to focus on competence instead of on matters of IT and infrastructure. Nevertheless, cloud computing has proven to have some limitations and disadvantages, especially for smaller business operations, particularly regarding security and downtime. Technical outages are inevitable and occur sometimes when cloud service providers become overwhelmed in the process of serving their clients. Cloud computing is the delivery of computing services such as servers, storage, databases, networking, software, analytics, and intelligence via the Internet.

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