Literature Review on Cloud Based Information System

**Introduction**: Information systems are very important part of a business as it provides wide range of information, analytics and insights of the business environment. And as these information systems are getting more advanced every day in terms of efficiency, scalability and productivity, businesses are accelerating faster than before. In recent times, cloud based information systems are showing brilliant promises in every aspects of business as they can provide diverse, low cost, highly scalable, widely available and maintainable services without even having physical machines [1]. In this report, a few literatures related to cloud based information system are reviewed in order to find out the structures of existing cloud based infrastructures, the challenges and issues to develop them, also to evaluate their performance.

**Literature Review**: Cloud computing technology is impacting and changing the traditional structure of information systems. The first literature [2] reviewed in this section will cover the deployment models, characteristics and types of services, the cloud technologies can offer. The other two literatures [3] [4] proposed specific architectures of cloud based information system. A critical analysis of the proposed systems is presented in order to identify the challenges to developing them and to evaluate their performance in real life.

The reason behind mass popularity of cloud technologies, is its dynamic characteristics that provide various services. Cloud technologies can provide on demand services with broad network accessibility. Resources can be dynamically allocated based on the demand of the users which also supports optimal resource utilization. Cloud computing provides distributed resources, utility and virtualization [2]. Cloud deployment models can be categorized in four types, such as public, private, hybrid and virtual private clouds. The private cloud infrastructure can be implemented at the organization’s data center where its resources and services are not exposed to the public. Whereas hybrid infrastructures have both public and private data centers, cloud resources and services. There are three types of service models, Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS) and Infrastructure-as-a-Service (IaaS). These service models can be implemented based on the business and customer requirements. SaaS models provide only software as a service which can be installed on vendor’s machine. PaaS models provide an environment to install and run their services, such as websites. IaaS models provide virtual machines and hardware to host and run their services [2].

Because of these characteristics and service models, cloud computing for business information system has become very popular. Cloud computing can offer resources and services in economic, scalable and flexible manner, which are also reliable and affordable. It can accelerate business processes by different dynamic services. In [3], a cloud based information system is proposed for community care of diabetes patients in China. The architecture has integrated with hybrid deployment model (consists of both private and public cloud services and resources), multi-sources of data, collection and storage of unstructured data and big data analysis in order to improve patient outcomes and reduce health care costs. In [4], another cloud based architecture is presented for Aged-Care information system. They tried to mitigate the cost and provide reliable services through cloud information system to elderly people based on the business and customer requirements where they have implemented complex layers of different service models. Both of architecture are discussed below to identify and address the challenges in developing their architecture. And following that an evaluation is presented.

*Challenges*: A few major challenges that are identified from the selected literature are mentioned and discussed below.

* Gathering customer and business requirement: First challenge to develop the infrastructure is to identify and understand the business and customer requirements as the main motive is to facilitate them. It has to make sure that the proposed architecture has meet all the requirements. X. Yang *et. al.* [3] first, identified the roles that are involved with the whole process such as patients, doctors, hospital data administrators etc. They have convinced that these data should be captured from multiple sources. Also some parts of their services should be publicly available whereas rest of them should be available in private networks. X. Li *et. al.* [4] identified that data of homely aged care are growing explosively, in order to deal with that they came up with intelligent configuration of cloud computing.
* Accumulating multi-source and unstructured data: Developing an information system is challenging because it can contain unstructured data which are very difficult to scale and maintain. That’s why cloud infrastructure also should be designed and implemented cautiously.
* Maintain data sources and privacy: Data sources and privacy maintenance is a big challenge. In [3], the authors had to propose a hybrid cloud deployment model because the information can contain sensitive data of the patients which should be private. On the other hand, some of the information has to be public. So that the architecture has become a bit complex to serve the purpose.
* Simplifying a complex architectural design: The infrastructures has to deal with big data which contains unstructured data from multiple sources. And this eventually leads to a complex architectural design. In [4], a three layer model services are proposed in order to simplify the architecture.

*Evaluation*: The cloud based information systems are designed to provide scalable and low cost reliable services. They are not dependent on local machines, so the performance is associated with its services. They ensure software reliability and availability of service architecture with virtualization [5]. Business owner does not have to be concerned about that. But there are challenges to integrate the cloud based infrastructure to the existing information system. There are issues like data integrations and privacy. By integrating cloud services, data of the system is stored and processed over cloud. So, all information including sensitive data are being stored in the third-party cloud storage. Regardless of those issues, cloud based information systems are reliable, affordable, available and scalable which enables mass amount of opportunities to the business organization.

**Conclusion**: In this report, a constructive discussion is made based on the existing cloud based information systems in terms of their structure, challenges and performance. We found out the challenges to develop and maintain them, also their performance based on their structures. Although it has some challenges, but cloud based platforms can ease business processes and help them to accelerate without having to worry about the data storage as they provide distributed resources, utility and virtualization.

**References**:

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