Cloud Computing: Software as a Service (SaaS) Model in Academic Book Publication

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ABSTRACT— ***Cloud computing is an attractive concept from several points of view for next generation online journal/book publication. It supports shared information repositories as well as sharing the real time and asynchronous interaction between teachers and learners. The promise of virtual universities in the cloud has been highlighted by the growing interest in On line Book Publications (OLBP) which are naturally hosted on clouds. The data collated are and will be stored in immense clouds with co-located storage and computing that performs "analytics" that transform data into information The basic delivery model of OLBP's is reasonably traditional with the scaling of clouds added. OLBP's emphasize new collaboration models for the interaction between mentors (graders, publishers) and students (clients). We suggest that OLBP's technology can be used in different ways. Rather than single publishing company aimed at many clients, we suggest that an alternative is multiple publishing companies customized for different communities. This transformation will drive the economy and create millions of opportunities in the emerging area of "academics". We discuss this revolution and its implications for individuals, universities, college of educations, polytechnics and the society.***

1. INTRODUCTION

Over the past years, the use of a lot of resources by organizations has made them to acquire in-built cluster and storage infrastructure to store data so as to support computing. Since these resources are shared among a lot of users, the amount desired may not always be available. This has led to the emergence of cloud computing, which has enabled clients to demand and immediately obtain resources as and at when needed. [7]

Cloud computing is Internet-based computing, whereby shared servers provide resources, software, and information to computers and other devices on demand. Cloud Computing has its origin in Grid Computing, where multiple resources are aggregated to a powerful system that can be accessed as a whole.

Cloud computing originated from grid computing but Cloud Computing goes one step further. The context of Cloud computing enables tasks to be assigned to a combination of software and services over a network. This network of servers forms 'the cloud'. This "cloud" can be spread over multiple data centers, and server farms. Actually, the end user does not know or does not care where exactly his request is executed. The most pertinent factor indeed, is that he does get a timely and effective response. Usually, a Web service interface is the common way to interact with the cloud.

Some of the characteristics of cloud computing are:

• Cloud computing uses Internet technologies to offer elastic services, elastic in the sense that it offers the ability of dynamically acquiring computing resources and
supports variable workload. A cloud service provider maintains a massive infrastructure to support elastic services.

• The resources used for these services can be measured and the users are charged
only for the resources they used.

• The maintenance and security are ensured by service providers.

• Economy of scale allows service providers to operate more efficiently due to specialization and centralization.

• Cloud computing is cost-effective due to resource multiplexing; lower costs for the
service provider are passed on to the cloud users.

• The application data is stored closer to the site where it is used in a device and location independent manner; potentially, this data storage strategy increases reliability and
security and, at the same time, it lowers communication costs.
[1].

Other specific characteristics include:

• **Reliability:** cloud systems ensures the capability of constant operation of the system without disruption, i.e. no loss of data, no code reset during execution, this is achieved through redundant resource utilization.

•**Quality of Service:** cloud computing supports a high quality of service by meeting specific requirements through the outsourced services and / or resources. In cloud computing, basic QoS metrics like response time, throughput etc. are guaranteed at least, so as to ensure that the quality guarantees of the cloud user are met.

•**Agility and adaptability** are essential features of cloud systems that strongly relate to the elastic capabilities. It includes on-time reaction to changes in the amount of requests and size of resources, but also adaptation to changes in the environmental conditions that e.g. require different *types* of resources, different *quality* or different *routes*, etc. Implicitly, agility and adaptability requireresources (or at least their management) to be autonomic and have to enable them to provide self-capabilities.

•**Availability** of services and data rendered by cloud systems is one of the main characteristics that gave rise to clouds in the first instance. Cloud computing has the ability to introduce redundancy for services and data, thus, failures are masked transparently

•**Cost reduction:** this is a major characteristic of cloud computing that builds up a cloud system which can adapt to changing consumer behavior and reduce cost for infrastructure maintenance and acquisition.

•**Pay per use:** this is the ability to build up cost according to the actual consumption of resources. Pay per use strongly relates to quality of service support, where specific requirements to be met by the system and hence to be paid for can be specified

(Keith Jeffery, Burkhard Neidecker-Lutz, 2010)

2. THE PROBLEM STATEMENT

There are various publications systems which publish as many papers/books in various fields; however, access to these resources poses a challenge on computational capacity to analyze the various papers in all available fields. Analyzing these resources with such magnitude exceeds the capacity of the conventional computing systems. With cloud computing, computational capacity is no longer a problem since it offers infinite computing resources on demand [10].

Cloud computing plays a large part in the ICT domain because of the following reasons [4]:

1. More and more enterprises look to outsource their IT.
2. Some businesses require additional capacity temporarily for particular needs.
3. Cloud systems is expoilted for experimental purposes thus avoiding disruptions.
4. Cloud service is utilized as 'neutral territory' for joint enterprise operations
5. Cloud computing is used for business continuity/disaster recovery
6. Cloud computing provides a low-cost entry point into ICT provision for companies.

Publications in academics are poorly managed in the country presently. There is no good medium of accessing resources, it is always very tedious to look for the necessary information. This serves as a motivation and hence providing worldly available resource by connecting various servers of various academic publications on line.

3. AIMS OF THE RESEARCH

This research aims at modeling a cloud computing platform for seeking academic resources worldwide. The primary aim of this work is to produce an effective and efficient way of sourcing for resources for publications in the country. It will also provide various journals interconnected together in which one can publish his/her research work.

This is achieved by deploying a SaaS model of Cloud computing into academic book publication. This work intends to co-publish a series of scholarly books across the world that will capture the newest advances in computing research. These publications will be readily available and will feature research surveys and graduate level textbooks that reflect high-quality, innovative research in a wide area of computing and information technology. All the titles in various journals/ Books Series will be accessible from a Digital Library (DL) that will be created as well as a wide range of commercial eBook platforms including Amazon, iBooks, and Barnes & Noble. Downloads of these books on multiple devices including mobile applications will also be available.

This work offers the computing community a much needed outlet and viable book publishing alternative to some of the big box publishers, who have increasingly come to dominate the world of sci-tech publishing, focusing on quality and access, not size, high prices or profit. This digital library will be led by an international board of computing luminaries, and individual books will be authored by innovators on the frontiers of the field and will have great appeal to

the growing computing community, including authors, researchers, practitioners, educators, and students. They will be published using a digital

first model with an emphasis on author services, speedy publication, low cost, wide distribution, and easy accessibility. Initially, this work will focus on computing research areas such as Mobile Computing, Cloud Computing, Bioinformatics, Artificial Intelligence and Networking. Over time, the Series will expand into other areas like Computer Graphics, Theoretical Computer Science, Embedded Systems, Operating Systems, Programming Languages, Software Engineering etc.

This work focuses on the interconnection between grid computing, cloud computing, web services and how all of these can be aggregated to manage grid computing effectively and efficiently thus applying the general context to effectively generating and managing a "cloud".

4. THE ON LINE PUBLICATION MODEL

This work has developed an On Line Publication Model (OLBP) to effectively and efficiently manage publications in academics in Nigeria using the 'Software as a Service' (SaaS) model of Cloud Computing. SaaS is one of the service delivery models of cloud computing, it is the end users' complete application accessible through a thin client interface like the web browser running through the cloud. The flowchart and Algorithm for this model is given below:

4.1 Flowchart for the OLBP Model

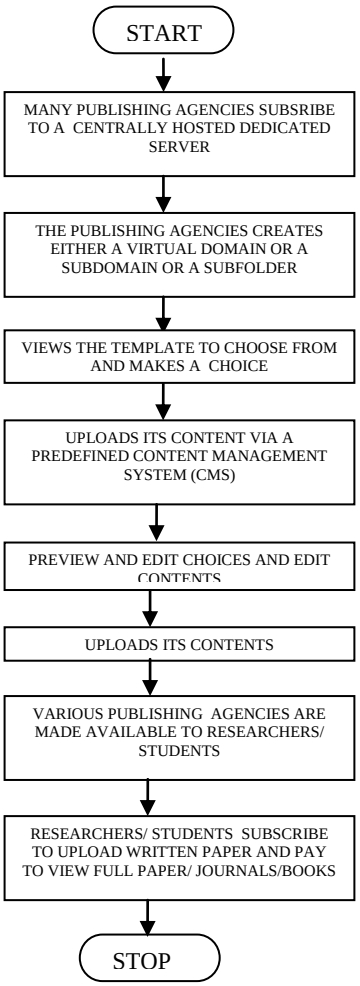

Figure1: Flowchart

4.2 Algorithm for the OLBP Model

STEP ONE: All Publishing Agencies within and outside the country are subscribed and connected to a centrally hosted dedicated server.

STEP TWO: The Publishing Agencies each create a virtual domain or a sub domain or a sub folder.

STEP THREE: The Publishing Agencies view the template to choose from and makes a choice.

STEP FOUR: The Publishing Agencies uploads its content via a predefined Content Management System (CMS).

STEP FIVE: The Publishing Agencies previews and edit choices and edit contents.

STEP SIX: The Publishing Agencies Uploads its contents.

STEP SEVEN: Various Publishing Agencies are made available to researchers/ students.

STEP EIGHT: Researchers/ students subscribe to upload written paper and pay to view full paper/ journals/books.
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STEP NINE: STOP

Figure 2: Algorithm for the OLBP Model

Figure 3: Future Grid Operating Model

FutureGrid is part of OLBP set up with cloud focus, the FutureGrid OLBP setup provides to its users:

- Support of Computer Science and Computational Science research
- A flexible development and testing platform for middleware and application users looking at interoperability, functionality, performance or evaluation
- It is user-friendly, the interactive session is easily accessed and supports Cloud softwares
- It is highly educational and a platform for paper publication and journals

Figure 2: Representaion of the OLBP Model

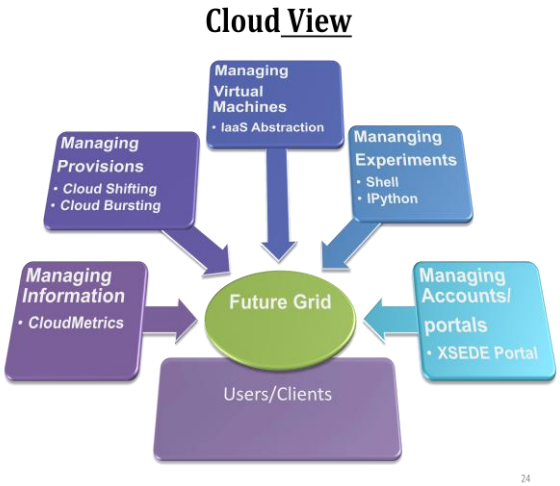

Figure 4: Cloud View

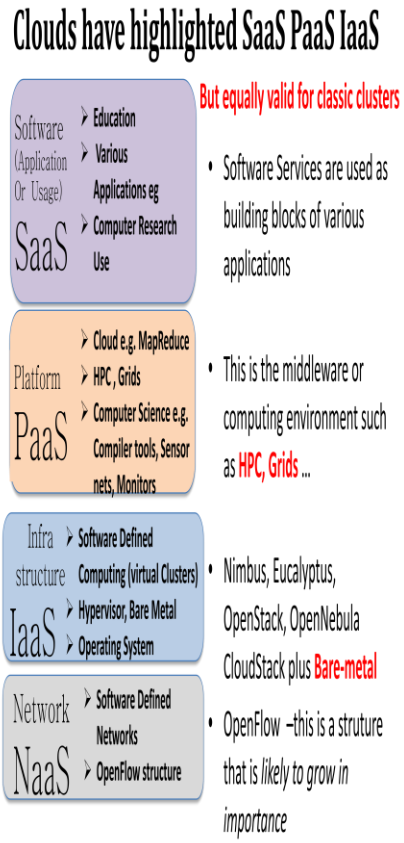

Figure 5: Various Cloud Models

5. LIMITATIONS AND DRAWBACKS OF CLOUD COMPUTING

High volume of research areas where scalability of OLBP make them attractive to reach a lot of students. There are some of area of interest in which there are either no faculty expertise or not enough researchers to justify the areas

There are, of course, some possible drawbacks. First and foremost is the antithesis to

the "access your data from anywhere" argument: If you happen to find yourself somewhere *without* an Internet connection, you won't be able to access the cloud. Keep your computing resources on-site, and you're guaranteed access

so long as you're sitting there. Keep them offsite with a third-party provider, and you're stuck if you find yourself somewhere without Internet access.

A close second is the question of how much control you have over your own data. In true cloud computing, you essentially have no control at all. You don't know how or where your data is physically stored; it's just "in the cloud."

Some critics even question whether or not you really *own* your data when you're storing it in a cloud. Recently, there has been backlash against Google's suite of services (maps, documents, even Gmail) because there is no official position as of yet on who owns what data.

And, of course, you're relying on a third party to guarantee that your data, and the services they provide, will always be available to you--that they have sufficient backups to guarantee your data will be safe in the event of power loss, server failure, fire, flood, whatever. We've already witnessed some vital cloud services, such as Gmail, Twitter and Facebook, go down temporarily.

Another potential drawback is being limited by your provider's ability--or willingness—to offer applications specific to your needs. Obviously you would not sign a contract with a provider who can't offer what you need when you first begin using its cloud, but your future needs could change. In another year, you might require that additional software be installed on the computers in the cloud in order to use it for your company's needs. There is no guarantee that the provider will be willing to do so, at which point you must either find an application they're willing to install that can act as an alternate solution, or deal with the hassle of taking your business elsewhere.

Finally, security is also a potential concern. If your laptop is stolen and the thief can figure out your log in information for the cloud's front end software, he or she could potentially gain access to all of the services provided by the cloud, as well as any data you have stored there. Granted, security is a concern in any situation where computers are involved, but it certainly should not be overlooked here.

6. CONCLUSION

The concept of "clouds" have proven a major commercial success over recent years and will play a large part in the ICT domain over the next 10years or more. This is so because future systems will exploit the capabilities of managed services and further provide resources. Clouds are of particular commercial interest not only with the growing tendency to outsource IT so as to reduce management overhead and to extend existing, limited IT infrastructures, but even more importantly, they reduce the entrance barrier for new service providers to offer their respective capabilities to a wide market with a minimum of entry costs and infrastructure requirements – in fact, the special capabilities of cloud infrastructures allow providers to experiment with novel service types whilst reducing the risk of wasting resources.

Cloud is used in running data analytics, collaboratively processing big data to help solve problem of availability of resources in academics in the country.

7. REFERENCES

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