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The Use of Moodle E-learning Platform: A Study in University of Computer Studies (Pakokku)

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Abstract

ICTs play an important role in education, having a special relevance in the instructional component, supported by Learning Management Systems (LMS), such as Moodle. Moodle platform is used as learning resources, as teaching-learning-assessment means alongside traditional teaching and learning and assessment methods. The Moodle represents one of the most widely used open-source e-learning platforms that enable the creation of a course website ensuring their access only to enrolled students. This paper presents a study about using moodle e-learning platform in university assessment process. The study aims to show the empirical results of analysis to 701 students from University of Computer Studies (Pakokku) in 2018-2019 Academic Year . In this paper, we analyse for assessment process that the number of subjects tested with moodle e-learning platform, the number of interested students in using moodle e-learning platform and the average grade scores for each subject according to different courses.

keywords: education, e-learning, moodle, assessment process, average grade scores

1. Introduction

E-learning is a process of education in electronic form through Internet network or the Intranet with the use of management system for education. Broadly there are two approaches generally seen in e-Learning. Asynchronous e-learning commonly facilitated by media such as e-mail and discussion boards supports work relations among learners and with tutors, even when participants cannot be online at the same time. It is a key component of flexible e-learning. In fact, many people take online courses because of their asynchronous nature, combining education with work, family and other commitments. Asynchronous e-learning makes it possible for learners to log on to an e-learning environment at any time and download documents or send messages to tutors or peers.

Students may spend more time refining their contributions, which are generally considered more thoughtful compared to synchronous communication.

Synchronous e-learning, commonly supported by media such as video conferencing and chat, has the potential to support learners in the development of learning communities. Learners and tutors experience synchronous e-learning as more social and avoid frustration by asking and answering questions in real time. Synchronous sessions help learners feel like participants rather than isolates.

There are two types of free platforms for online learning. First, there are those hosted on a public site and the user just signs up and uses the platform, but the platform "lives" on a server somewhere in cyberspace. The second type of platform is that must be downloaded, saved and hosted on the user's own server. The free online class platforms that must be hosted on your own server are "open source applications" [1]. This means that the software is available free for limited use under the terms of the GNU General Public License (GPL). This basically means that the user can copy it, distribute it, even charge for

it, but cannot get patents on it. Also, the source code must always remain open and available for viewing by anyone looking at the site so that it does not become proprietary

2. Motivation of System

One of the most significant developments in the use of information technology in universities in the last decade has been the adoption and use of e-learning systems to support the processes of teaching and learning. The learning management system (LMS), also known as course management system (CMS) or the virtual learning environment (VLE), is an e-learning system that has been widely adopted by universities. The LMS is web-based software that is used for the delivery, tracking and managing of education and training online. It contains features for distributing courses over the Internet and online collaboration.

Since the late 1990s, the utilization of LMSs for online education has steadily increased in higher education. Nowadays, LMSs have become indispensable tools for online education. Whether focusing on distance education or class-room based education, most universities use LMSs to support and improve learning and teaching processes. For the sake of better to test the assessments, this paper shows the universities should use LMS. By using LMS, the results from assessment processes are fair, exact and lacking in miscalculation.

3. Moodle for e-Learning

Moodle (Modular Object-Oriented Dynamic Learning Environment) is basically an Open Source e-learning platform. Moodle is a Course Management System (CMS) - a software package designed to help educators to create quality online courses. Such e-learning systems are sometimes also called Learning Management Systems (LMS) or Virtual Learning Environments (VLE) [2]. Moodle presents an excellent platform for resources and communication tools. It was created by Martin Dougiamas, a computer scientist and educator who deeply believes that a CMS should be created by an educator and not by an engineer [3].

To run, Moodle must first be installed on a main server; an administrator configures the settings to enable access through user names and passwords. The user accesses Moodle through the Internet as it is web based and does not have to install anything locally. Moodle is written in php with an SQL database. Moodle has updates installed from time to time and so it is continually being modified and enhanced.

Moodle is a template-based system to which content must be added. This makes Moodle's interface very intuitive and allows for easy navigation. The whole page is presented in a "flat view" format. It is laid out in small blocks and organized around sections following a topic or weekly outline. Each section has its own tools such as lessons, quizzes, assignments, and forums. All blocks on a page can be individually arranged, and the elements within each section can be easily moved around or be hidden [4].

4. System Evaluation

In this system there are three main users which are the administrator, the lecture and the student, each one of them has their specific task and roles they can perform within the system.

4.1 Administrator

The system administrator will have full access privilege of the system which the other users cannot perform. Some of these include: - assigning roles to user (who is the Admin, lecturer or student), deleting users, adding (department, faculties), and lastly creating users.

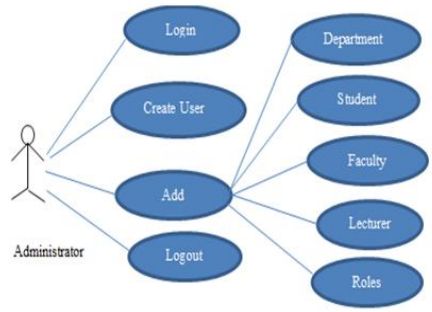

Figure 1. Administrator Use case

4.2 Lecturer

The lecturer will have the privileges of uploading and downloading documents, posting news about (test, class, and assignments), downloading assessment results and upload results (coursework).

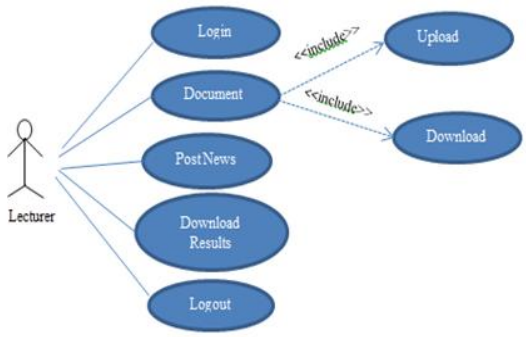

Figure 2. Lecturer Use case

4.3 Student

The student will have less privilege, the student will be able to upload and download documents, and view posts news by lectures, and administrators, and lastly students will be able to view their coursework.

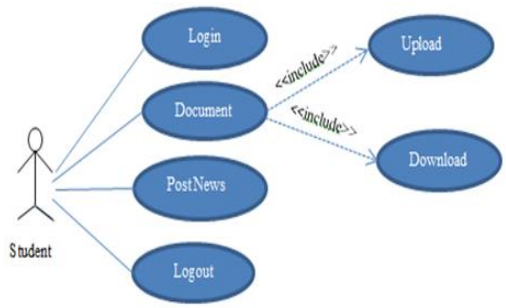

Figure 3. Student Use case

5. Assessment Activities using Moodle e-Learning

The Moodle represents one of the most widely used open-source e-learning platforms, which enable the creation of a course website, ensuring their access only to enrolled students. This platform allows the exchange of information among users geographically dispersed, through mechanisms of synchronous and asynchronous communication. In a functional perspective, it has easily configurable features, allowing the creation of student assessment processes (quizzes, online tests and surveys), as well as managing their tasks with their timetable, besides offering a wide variety of complementary tools to support the teaching and learning process.

Table 1. Activities and Module using e-Learning Platform

Activity	Module	Description
Assessment	Choice	allows teachers to ask questions and specify multiple choice answers; represents a useful mechanism to stimulate thinking about a topic.
	Quiz	allows teachers to design and build quizzes with a variety of questions, with different types of answers, such as multiple choice, true/false, short answer.
	Survey	allows teachers to gather feedback from students using prepackaged questionnaires.
	Feedback	allows teachers to create surveys to collect feedback.

6. Empirical Results

In our University, moodle e-learning test is used for assessment process of subjects according to different courses. By collecting statistical data from moodle testing documents, we analyze the average grade score of each subject on different courses. Then, according to the number of students involved in assessment test, the numbers of interested students in moodle assessment test are shown in Figure 4.

6.1 Subjects Tested with Moodle E-Learning

In University of Computer Studies (Pakokku), for 2018-2019 Academic Year, 24 subjects from each different courses are tested. In the coming Academic Years, we will try to test assessment processes for the remaining subjects from each course. Besides, we will use moodle E-Learning for lectures and assignments.

Table 2. Subjects for First Year

Subject Code	Subject Name
CST-101	Principle of IT
CM-102	CM(111) Calculus

Table 3. Subjects for Second Year

Subject Code	Subject Name
CST-201	Java Programming Language
CST-203	Digital Fundamental
CST-204	Database Management System
CS-205	Professional JavaScript for Web Developer
CS-206	System Analysis and Design & Software Engineering
CT-205	Professional JavaScript for Web Developer
CT-206	Electrical Circuits

Table 4. Subjects for Third Year

Subject Code	Subject Name
CS-304	Software Engineering
CS-305	C# Programming Language
CS-306	Programming Language
CT-305	Linear Control System

Table 5. Subjects for Fourth Year

Subject Code	Subject Name
CS-404	Database Management System
CS-405	Software Engineering
CT-404	Computer Architecture & Organization
CT-405	Modern Control System
CT-406	Data and Computer Communication

Table 6. Subjects for Fifth Year

Subject Code	Subject Name
CS-502	Distributed System & Advanced Networking
CS-503	Information Assurance & Security
CT-502	Distributed System & Advanced Networking
CT-503	Computer System Fundamental
CT-504	Crypto & Networking
CT-505	Digital Processing

6.2 Number of Interested Students in Moodle E-Learning

In University of Computer Studies (Pakokku), the number of interested students for each course is shown in Figure 4. The students in Third Year and Fifth Year courses are completely interested in moodle e-learning.

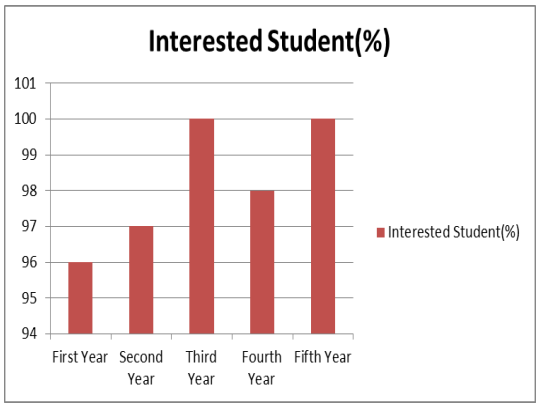

Figure 4. Number of Interested Students in Moodle e-Learning

6.3 Average Grade Scores for Each Subjects

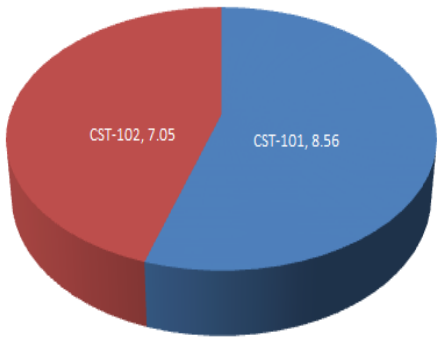

Figure 5. Average Grade Scores for First Year

Figure 5 shows the average grade scores of subjects from First Year course. There are two subjects tested with moodle e-learning for assessment evaluation such as CST-101 (Principle of IT) and CST-102 (CM-111 _Calculus). The average grade scores of these subjects are **8.06** and **7.05** respectively.

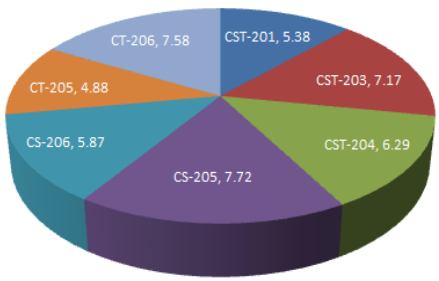

Figure 6. Average Grade Scores for Second Year

In Second Year course, seven subjects use moodle e-learning for assessment evaluation. They are CST-201 (Java Programming Language), CST-203 (Digital Fundamental), CST-204 (Database Management System), CS-205 (Professional JavaScript for Web Developer), CS-206 (System Analysis and Design & Software Engineering), CT-205 (Professional JavaScript for Web Developer), CT-206 (Electrical Circuits). The average grade scores of these subjects are as shown in Figure 6.

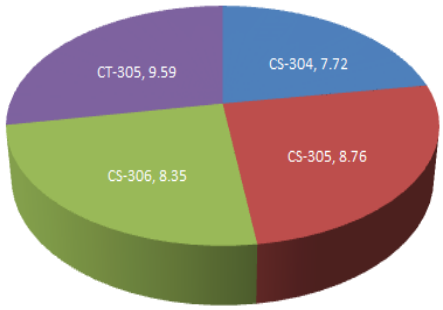

Figure 7. Average Grade Scores for Third Year

In Figure 7, four subjects are tested with moodle e-learning for assessment process. These subject are CS-304 (Software Engineering), CS-305 (C# Programming Language), CS-306 (Programming Language), CT-305 (Linear Control System). The average grade scores of these subjects are **7.72**, **8.76**, **8.35** and **9.59** respectively.

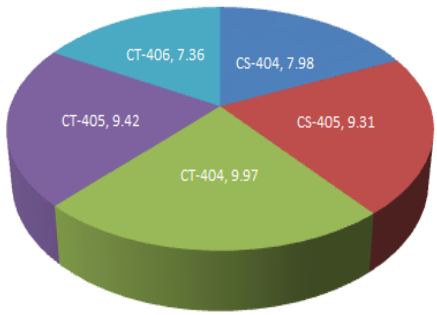

Figure 8. Average Grade Scores for Fourth Year

In Fourth Year course, the subjects: CS-404 (Database Management System), CS-405 (Software Engineering), CT-404 (Computer Architecture & Organization), CT-405 (Modern Control System), and CT-406 (Data and Computer Communication) use moodle e-learning for assessment evaluation. The average grade scores of CS-404 is 7.98, CS-405 is 9.31, CT-404 is 9.97, CT-405 is 9.42, and CT-406 is 7.36 as shown in Figure 8.

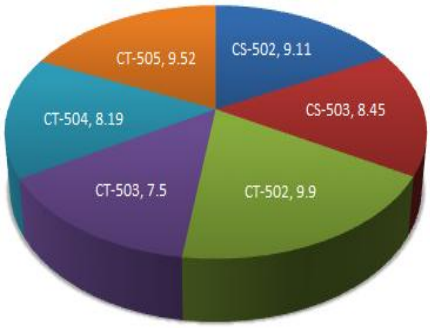

Figure 9. Average Grade Scores for Fifth Year

Figure 9 shows the subjects evaluated for assessment process in Fifth Year course. The subjects used moodle e-learning are CS-502 (Distributed System & Advanced Networking), CS-503 (Information Assurance & Security), CT-502 (Distributed System & Advanced Networking), CT-503 (Computer System Fundamental), CT-504 (Crypto & Networking), CT-505 (Digital Processing). The average grade scores of these subjects are **9.11**, **8.45**, **9.9**, **7.5**, **8.19**, and **9.52** respectively.

7. Benefits of Using Moodle E-Learning

For Universities, using Moodle E-Learning has the following several benefits.

- Moodle is an Open Sourced Software, which means users are free to download it, use it, and modify it.
- It lets teachers provide and share documents, graded assignments, discussion forums, etc. with their students in an easy-to-learn fashion, and in high quality on-line courses.
- It can be used on almost all servers that can use PHP. Users can download and use it on any computer and can easily upgrade it from one version to the next.
- It is developed with both pedagogy and technology in mind.
- The credibility of Moodle is very high.
- It runs without modification on any system that supports PHP such as Unix, Linux and Windows.
- It has excellent documentation, and strong support for security and administration.

8. Conclusion

In our University, although moodle e-leaining cannot replace traditional education, the internet opens new teaching-learning-assessment opportunities. This paper analysed the supports of Moodle platform and their use at the University of Computer Studies (Pakokku) for assessment processes. Moodle is a great tool for tutors because it is a platform to create and save teaching material easily and a collaborative online platform for teachers and students to learn together. The increase in the use of moodle e-learning by universities and other formation institutions is a reality and will definitely have an important impact on the learning process. The Moodle platform has used in University of Computer Studies (Pakokku) to support for the teachers who aim at increasing the quality of online courses, but also as a support for students in order to facilitate their learning.

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A Study of Cloud Computing Technology

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Abstract

Nowadays, Cloud Computing Technology plays as an important role in service of the internet. Cloud Computing Technology is used to store data which we need frequently in web based cloud storage services so that it can be accessed whenever we need them. Cloud computing which is based on Internet has the most powerful architecture of computation. Many webs based cloud storage services available out of which Amazon S3 and Google Drive are immensely popular among users. Security has become the major concern in cloud and cloud attacks too. This paper proposes internet-based cloud computing, by exploring its characteristics, service models, and deployment models in use today. Besides, this paper analyses the benefits and challenges associated with cloud computing. Our university has used internet-based LMS (Learning Management System) in 2018-2019 Academic Year for assessment processes. All data concerned with this assessment processes are stored on the cloud.

Keywords: Information Technology, SaaS, PaaS, IaaS, Cloud Computing Technology

1. Introduction

Like real clouds which are the collection of water molecules, the term "cloud" in cloud computing is the collection of networks. Cloud computing is an enhanced technology and become a vital technology to run business. Cloud computing has successfully gained the interest in organizations because it offers a wide range of solutions and advantages to business such as increase flexibility, scalability, agility, reduces costs and higher efficiencies [9,8,7]. Today, the word "cloud computing" is an essential terminology in the Information Technology (IT) world and requirements of cloud applications vary based on the resources which are demanded as services. Cloud computing can be defined as the use of virtual resources that are highly scalable and can be shared by different and diverse users. It was driven by the increased use of electronic devices including laptops, smart phones and tablet PCs. Current studies have indicated that this is the fastest growing areas within the digital economy. Therefore, the requisition of hardware and software at the user side is decreased. We need to have a web browser like chrome to use cloud computing. The key features of cloud computing are Resource Pooling and Elasticity, Self-Service and On-Demand Services, Pricing, Quality of Service. The relationship among these factors such as evolution, characteristics, architectures, services, deployment, benefits and challenges of cloud computing are discussed in this paper.

2. Cloud Computing

Cloud computing is an emerging technology that has become one of the most popular computing technologies. Cloud computing is something that all applications and services moved into "cloud". The word "cloud" can be defined as remote environment from Information

Technology perspective [10]. Many companies are delivering services from the cloud. In cloud computing, the IT and business resources, such as servers, storage, network, applications, and processes, can be dynamically provisioned to the user's needs and workload. Cloud application management is to address these issues and propose solutions to make it possible to have insight into the application that runs in the cloud, as well as implement or enforce enterprise policies like governance and auditing and environment management while the application is deployed in the cloud [13]. Some common use of cloud service providers are shown in the following:

- **Google** — has a private cloud that it uses for delivering Google Docs and many other services to its users, including email access, document applications, text translations, maps, web analytics, and much more.
- **Microsoft** — has Microsoft® Office 365® online service that allows for content and business intelligence tools to be moved into the cloud and Microsoft currently makes its office applications available in a cloud.
- **Salesforce.com** — runs its application set for its customers in a cloud, and its Force.com and Vmforce.com products provide developers with platforms to build customized cloud services.

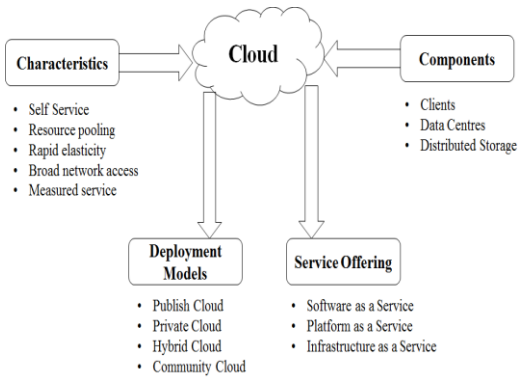

Figure 1. Essential of Cloud Computing

2.1 Evolution of Cloud Computing

In a speech at MIT around 1960, John McCarthy indicated that like water and electricity, computing can also be sold like a utility. And in 1999, the Salesforce Company started distributing the applications to the customers through a convenient website [4]. Nowadays each and every person is using the services of cloud computing in their daily life. Examples of cloud computing are Google Photos, Google Drive, iCloud, and so on. In the future cloud computing will become the basic need of IT Industries.

Table 1. Evolution of Cloud Computing

Evolution	Periods	Descriptions
Centralized	1970-80s	Main Frame Technologies
Distributed	1990s	Client Server Distributed Technologies
Internet	2000s	World Wide Web (www) Technologies
Mobile	2010s	Transported Technologies (Anywhere, Anytime, Anyuser)
Cloud and UbiComp	2020s	Pervasive/ Ubiquitous Computing (Embedding processor in every live object)

2.2. Characteristics of Cloud Computing

The cloud computing is one of the distributed systems that represents a sophisticated model. Cloud computing has a variety of characteristics. They are:

• **Shared Infrastructure** — uses a virtualized software model, enabling the sharing of physical services, storage, and networking capabilities.

• **Dynamic Provisioning** — allows for the provision of services based on current demand requirements. This is done automatically using software automation, enabling the expansion and contraction of service capability, as needed.

• **Network Access** — needs to be accessed across the internet from a broad range of devices such as PCs, laptops, and mobile devices, using standards-based Application Programming Interface (APIs). Network access includes private cloud that operates within a company's firewall, public clouds or a hybrid cloud.

• **Managed Metering** — uses metering for managing and optimizing the service and to provide reporting and billing information [6].

Three basic components of cloud computing are as follows:

1. **Client Computers:** The end user can interact with the cloud using the client computers.
2. **Distributed Servers:** The servers are distributed among the different places but acts like they as working with each other.
3. **Data Centers:** Data centers are the compilation of servers.

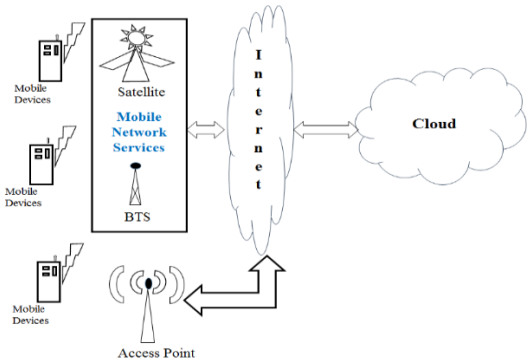

Figure 2. A typical of Cloud Computing

2.3. Architectures of Cloud Computing

There are several processes and architecture of cloud computing that need to be discussed. Architecture is the hierarchical view of describing a technology. This architecture usually includes the components over which the existing technology is built and the components that are dependent on the technology. The cloud also has an architecture that describes its working mechanism. There are four layers of cloud computing.

• **Layer 1 (User/Client Layer)** — Layer 1 is the lowest layer in the cloud architecture. All the users or client belong to this layer.

• **Layer 2 (Network Layer)** — Layer 2 allows the users to connect to the cloud. The whole cloud infrastructure is dependent on this connection where the services are offered to the customers. This is primarily in the Internet of the case of a public cloud.

• **Layer 3 (Cloud Management Layer)** —Layer 3 consists of softwares that are used in managing the cloud. The softwares can be a cloud operating system (OS), a software that acts as an interface between the data center (actual resources) and the user, or a management software that allows managing resources.

• **Layer 4 (Hardware Resource Layer)** — Layer 4 consists of provisions for actual hardware resources. Usually, in the case of a public cloud, a data center is used in the back end. The layering is strict, and for any cloud application. There can be a little loose isolation between layer 3 and layer 4 depending on the way the cloud is deployed [5].

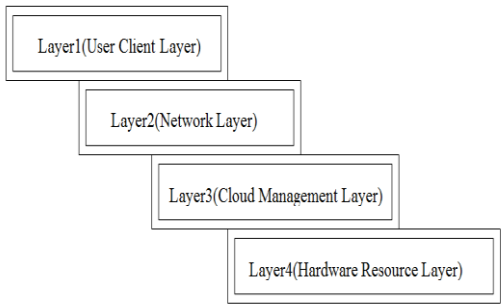

Figure 3. Architectures of Cloud Computing

2.4. Services of Cloud Computing

There are three services provided by cloud computing that are Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) [2]. The basic examples of cloud computing which are used by general people in daily life are Facebook, YouTube, Dropbox, Gmail and so on. It offers scalability, flexibility, agility, and simplicity.

1. Infrastructure-as-a-Service (IaaS): The bottom layer of service model is IaaS. The main concept of IaaS is virtualization. IaaS provides the infrastructure for the applications to run and the necessary computational resources and infrastructure such as storage, processing unit, networks etc. [11]. Infrastructure is the most vital among the three service models because it is the basic need to launch the organization's services over the internet in a cloud platform, to make their services available to clients and applications to run them smoothly. For example, a user can create virtual machines by login to the IaaS platform [3].

2. Platform-as-a-Service (PaaS): It is a middle layer which gives the organizations, institutions or companies a freedom and framework for developers to develop their own applications and deploy them and make customers within their company to access the resources [3]. Examples of programming platforms and tools are Java, Python, .Net, MySQL and APIs [12].

3. Software-as-a-Service (SaaS): Service providers will install their software applications operated by services for the users to use as a service. SaaS does not require own software and hardware resources. It is a software distribution model where a third-party provider hosts applications and makes them available to customers over the high-speed internet connection. Examples of SaaS are Google Docs, Microsoft Office 365, salesforce.com, etc. [2].

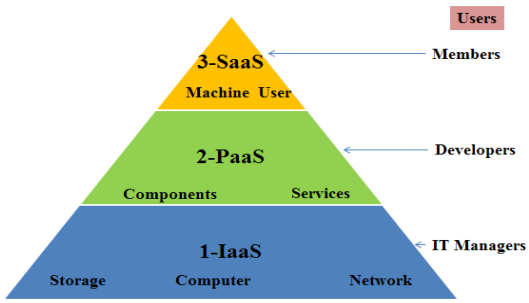

Figure 4. Cloud Computing Service Model

2.5. Deployment of Cloud Computing

Deploying cloud computing can differ depending on the requirements of users. The following four deployment models have been identified, each with specific characteristics that support the needs of the services and users of the clouds in particular ways [16].

- **Private Cloud / Internal Cloud** — The cloud infrastructure has been deployed, and is maintained and operated for a specific organization. The operation may be in-house or with a third party on the premises.
- **Community Cloud** — The cloud infrastructure is shared among a number of organizations with similar interests and requirements. This may help limit the capital expenditure costs for its establishment as the costs are shared among the organizations.

• **Public Cloud / External Cloud** — The cloud infrastructure is available to the public on a commercial basis by a cloud service provider. This enables a consumer to develop and deploy a service in the cloud with very little financial outlay compared to the capital expenditure requirements normally associated with other deployment options.

• **Hybrid Cloud / Virtual Private Cloud Model** — The cloud infrastructure consists of a number of clouds of any type, but the clouds have the ability through their interfaces to allow data and/or applications to be moved from one cloud to another. This can be a combination of private and public clouds that support the requirement to retain some data in an organization, and also the need to offer services in the cloud. These clouds cater for bursty demands or resource demands known beforehand. The benefit of hybrid clouds for handling sensitive data can be known after using it [13].

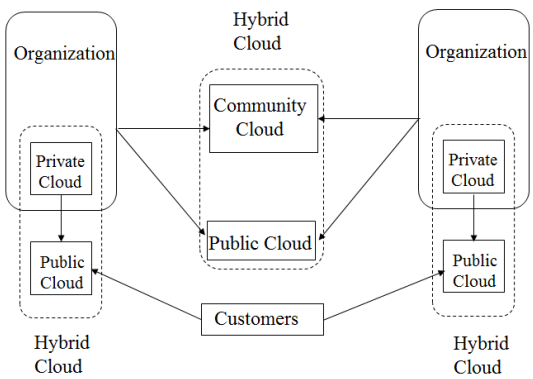

Figure 5. Cloud Deployment Model

3. Benefits of Cloud Computing

The following are some of the possible benefits for those who offer cloud computing-based services and applications:

• **Cost Savings** — Companies can reduce their capital expenditures and use operational expenditures for increasing their computing capabilities. This is a lower barrier to entry and also requires fewer in-house IT resources to provide system support.

• **Agility** — Due to the availability of the Internet, cloud computing is around the clock. This helps the organizations to deliver the services in the shortest time. Cloud computing increases agility by offering the following three types of low-level administrations from cloud providers [14]:

1. **System Infrastructure** – machines and spare part maintenances
2. **Backup Policy** – backup management
3. **Single Application** – software management (upgrade software / application support)

• **Scalability/Flexibility** — Companies can start with a small deployment and grow to a large deployment fairly rapidly, and then scale back if necessary. Also, the flexibility of cloud computing allows companies to use extra resources at peak times, enabling them to satisfy consumer demands.

• **Reliability** — Services using multiple redundant sites can support business continuity and disaster recovery.

• **Maintenance** — Cloud service providers do the system maintenance, and access is through APIs that do not require application installations onto PCs, thus further reducing maintenance requirements.

• **Mobile Accessible** — Mobile workers have increased productivity due to systems accessible in an infrastructure available from anywhere.

• **Globalize the workforce** — People worldwide can access the cloud with Internet connection.

• **More effective monitor projects** — It is possible to confine within budgetary allocations and can be ahead of completion cycle times.

• **Reduction capital costs** — There is no need to spend huge money on hardware, software, or licensing fees.

• **Streamline business processes** — It is possible to get more work done in less time with less resource [1].

4. Challenges of Cloud Computing

The following are some of the notable challenges associated with cloud computing, and although some of these may cause a slowdown when delivering more services in the cloud, most also can provide opportunities, if resolved with due care and attention in the planning stages [6].

• **Security and Privacy** — Perhaps two of the more "hot button" issues surrounding cloud computing relate to storing and securing data, and monitoring the use of the cloud by the service providers. These issues are generally attributed to slowing the deployment of cloud services. These challenges can be addressed, for example, by storing the information internal to the organization, but allowing it to be used in the cloud. For this to occur, though, the security mechanisms between in organization and the cloud need to be robust and a Hybrid cloud could support such a deployment.

• **Lack of Standards** — Clouds have documented interfaces; however, no standards are associated with these, and thus it is unlikely that most Clouds will be interoperable. The Open Grid Forum is developing an Open Cloud Computing Interface to resolve this issue and the Open Cloud Consortium is working on cloud computing standards and practices. The findings of these groups will need to mature, but it is not known whether they will address the needs of the people deploying the services and the specific interfaces these services need.

• **Continuously Evolving** — User requirements are continuously evolving, as they are the requirements for interfaces, networking, and storage. This means that a "cloud," especially a public one, does not remain static and is also continuously evolving.

• **Compliance Concerns** — The Sarbanes-Oxley Act (SOX) in the US and Data Protection directives in the EU are just two among many compliance issues affecting cloud computing, based on the type of data and application for which the cloud is being used. The EU has a legislative backing for data protection across all member states, but in the US data protection is different and can vary from state to state. As with security and privacy mentioned previously, these typically result in Hybrid cloud deployment with one cloud storing the data internal to the organization.

•**Data Storage** — The storage of big data through traditional storage is problematic because hard drives often fail, data protection mechanisms are not effective, and the speed of big data requires storage systems in order to expand rapidly, which is difficult to achieve with conventional storage systems. Cloud storage services offer almost unlimited storage with a great deal of error tolerance, which offers potential solutions to address the challenges of big data storage [15].

5. Conclusion

In this review paper, the introduction, evolution, characteristics and architectures of cloud computing and also different approaches of cloud computing and some of its advantages are described in short. The application area of cloud computing is continuously increasing. Today almost all small and big industries are using cloud computing to manage storage, traffic, and hardware requirements. Cloud has different environments. The number of users and organizations connected to the Internet is increasing. This also increases the probability of probing and attacking using viruses, worms and

cyber terrorists. Cloud computing cannot be run without the internet connection. And so, the cloud ecosystem is discussed, which briefly points out different roles involved in cloud computing. Cloud computing has the advantage of helping to reduce costs by paying for the value of the resources used, which helps to develop big data. Therefore, it is clear that there is a major impact of cloud computing on society and business. It is necessary for our computer systems to be reliable and robust because most of the businesses are now becoming dependent on services provided by third-party.

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