



Effective Assistance & Productive Interaction Engaging Students and Management Aided by Cloud Computing

P.Lakshmi Narayana, B.Meena Bharghava, M.Srujan, P.Vihari

Student, Department of ECE,

KL University,

A.P., India

Abstract: Ever since cloud computing came into existence, it has progressively become popular and emerged to be an indispensable technology with an unprecedented demand in the contemporary IT field. This paper discusses the use of cloud computing in professional education and learning environment envisaged to evade turmoil in students path to successful career. We believe that the prevailing technology of cloud computing which has struck the chord off late will be effective in expediting the journey of student in establishing him/her as a professional student in a cost effective manner by utilizing the available cloud-based applications offered by the cloud service providers.

Keywords: cloud computing; SaaS, IaaS, PaaS, Student management.

I. INTRODUCTION

Cloud Computing is a technology that uses the internet and central remote servers to maintain data and applications. Cloud computing allows consumers and businesses to use applications without installation and access their personal files at any computer with internet access. This technology allows for much more efficient computing by centralizing data storage, processing and bandwidth. A simple example of cloud computing is Yahoo email, Gmail, or Hotmail etc. All you need is just an internet connection and you can start sending emails. The server and email management software is all on the cloud (internet) and is totally managed by the cloud service provider Yahoo, Google etc. The consumer gets to use the software alone and enjoy the benefits. The analogy is, 'If you need milk, would you buy a cow?' [1] In both academia and industry, cloud computing has been recently attracting significant momentum and attention as one of those opportunities that could prove to be of immense benefits and empowering in some situations, due to its flexibility and pay-per-use cost structure, for organizations.

II. CLOUD COMPUTING

The *cloud computing* term was derived from the way the Internet is often represented in network diagrams. Due to the fact it involves the existence of data centers that are able to provide services; the cloud can be seen as a unique access point for all the requests coming from the world wide spread clients (see fig.1).

National Institute of Standards and Technology (NIST) definition is a generally accepted standard and it is given as; Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

Cloud computing comprises of three layers [5]:

- Infrastructure as a service (IaaS)
- Platform as a service (PaaS)
- Software as a service (SaaS)

Depending on the requirements, the customers can choose one or more services provided.



Fig. 1 Cloud and Data center

III. Cloud Computing Services

A. Software as a Service (SaaS):

The capability provided to the consumer is to use the provider’s applications running on a cloud infrastructure. The applications are accessible from various client devices through either a thin client interface, such as a web browser (e.g., web-based email), or a program interface. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user specific application configuration settings.

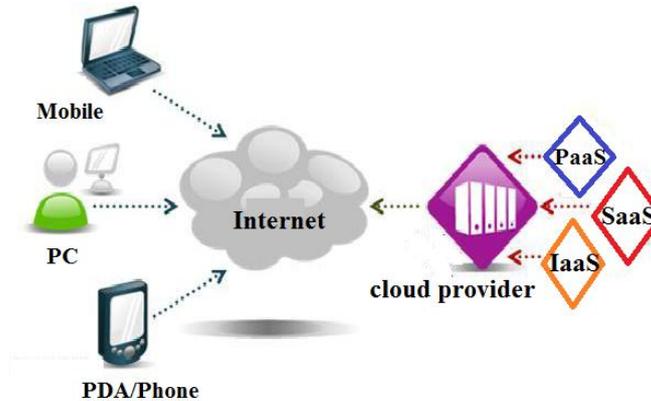


Fig.2.Cloud computing technology

B. Platform as a Service (PaaS):

The capability provided to the consumer is to deploy onto the cloud Infrastructure consumer-created or acquired applications created using programming languages, libraries, services, and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly configuration settings for the application-hosting environment.

C. Infrastructure as a Service (IaaS):

The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, and deployed applications; and possibly limited control of select networking components (e.g., host firewalls).[4]

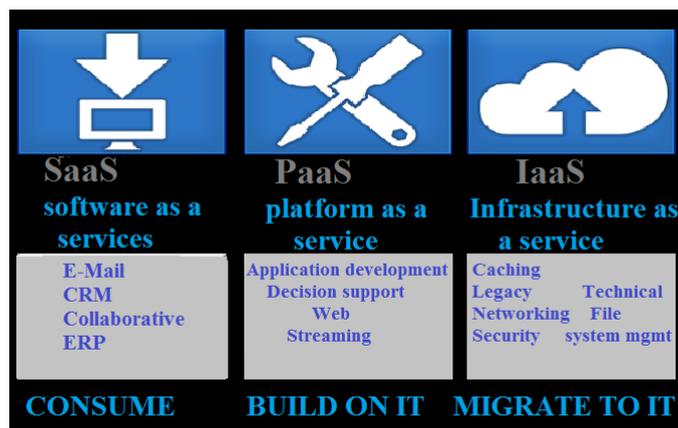


Fig.3. Cloud Services

IV. Deployment Models

A. Private cloud:

The cloud infrastructure is provisioned for exclusive use by a single organization comprising multiple consumers (e.g., business units). It may be owned, managed, and operated by the organization, a third party, or some combination of them, and it may exist on or off premises.

B. Community cloud:

The cloud infrastructure is provisioned for exclusive use by a specific community of consumers from organizations that have shared concerns (e.g., mission, security requirements, policy, and compliance considerations). It may be owned,

managed, and operated by one or more of the organizations in the community, a third party, or some combination of them, and it may exist on or off premises.

C. Public cloud:

The cloud infrastructure is provisioned for open use by the general public. It may be owned, managed, and operated by a business, academic, or government organization, or some combination of them. It exists on the premises of the cloud provider.

D. Hybrid cloud:

The cloud infrastructure is a composition of two or more distinct cloud infrastructures (private, community, or public) that remain unique entities, but are bound together by standardized or proprietary technology that enables data and application portability (e.g., cloud bursting for load balancing between clouds).

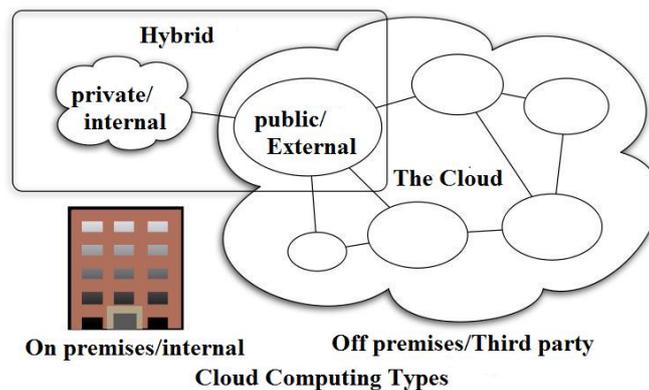


Fig.4.Deployment Models

V. ADVANTAGES AND DISADVANTAGES:

Cloud computing is widely accepted today due to its

Key advantages:

- The cost is low or even free in some cases. Also, there are no costs (or very small ones) for hardware upgrades;
- for some applications (like spreadsheets) it can be used even in the offline mode, so when the client goes back online a synchronization process is refreshing the data;
- the strong connection that exists today between the users and their personal computers can be completely broken because a customer can reach the same result by using any Internet connected device having minimum software requirements;
- devices with minimal hardware requirements (mobile phones, for example) could be successfully used as cloud clients;
- in order to become part of the cloud, there is no need to download or install a specific software, only the Internet connection is required;
- improved improbability – it is almost impossible for any interested person (thief) to determine where the machine is located that stores some wanted data (tests, exam questions, results) or to find out which is the physical component he needs to steal in order to get a digital asset;
- Centralized data storage – losing a cloud client is no longer a major incident while the main part of the applications and data is stored into the cloud so a new client can be connected very fast. Imagine what is happening today if a laptop that stores the examination questions is stolen;

Some of the main cloud computing disadvantages are the following:

- the Internet connection speed may affect the overall performances;
- on a long term basis, the data center subscription fee may be more expensive than buying the hardware;
- The service quality is crucial and the need of the backups is critical when speaking about data security.

VI. Inside Out of Student Management Application

The proposed Student Management application architecture can be divided into the following layers: Infrastructure layer as a dynamic and scalable physical host pool, software resource layer that offers a unified interface for student management application developers, resource management layer that achieves loose coupling of software and hardware resources, service layer, containing three levels of services (software as a service, platform as a service and infrastructure as a service), application layer that provides with content production, content delivery, virtual laboratory, collaborative learning, assessment and management features.

A. *Infrastructure layer* is composed of information infrastructure and interaction resources. Information infrastructure contains Internet/Intranet, system software, information management system and some common software and hardware; productive interaction resources engaging students and faculty are accumulated mainly in traditional interaction model and distributed in different departments and domain. This layer is located in the lowest level of cloud

Service middle ware ,the basic computing power like physical memory,CPU,memory is provided by the layer.Through the use of virtualization technology,physical server,storage and network form virtualization group for being called by upper software platform.

B.Software resource layer mainly is composed by operating system and middleware.Through middleware technology,avariety of software resources are integrated to provide a unified interface for software developers,so they can easily develop a lot of applications based on software resources and embed them in the cloud, making them available for cloud computing users.

C.Resource management layer is the key to achieve loose coupling of software resources and hardware resources.Through integration of virtualization and cloud computing scheduling strategy ,on-demand free flow and distribution of software over various hard ware resources can be achieved.

D.Service layer has three levels of services namely, SaaS (Software as a service), PaaS (Platform as a service), and IaaS (Infrastructure as a service). In SaaS, cloud computing service is provided to customers. As is different from traditional software, users use software via the Internet, not to need a one-time purchase for software and hardware, and not to need to maintain and upgrade, simply paying a monthly fee. Users can choose the devices and the number of devices according to the complexity of dealing with the content. Virtualization technology enables the platform to show a strong level of flexibility.

E. Application layer: This layer is the specific applications of integration of the interaction resources in the cloud computing model, including placement assistance, overseas study guidance resources. The interactive sessions carried out through student management application will presumably prove instrumental in transforming the traditional approach of teaching to more holistic methods of teaching. This layer mainly consists of content production, educational objectives, content delivery technology, assessment and management component. The student management application and its services are made available to the Institutes/ colleges /schools on fair utility charge basis.

VII. Expected Benefit from the Architecture

The intended advantages derived from the proposed architecture are as follows:

- a) *Powerful computing and storage capacity:* Cloud based student management application locates the computing and data in a large number of distributed computers,the sea of clouds in the tens of thousands of computers to provide powerful computing power and huge data storages pace,putsthe“cloud”as a service available to students via the Internet.
- b) *High availability:*Through the integration of mass storage and high-performance computing power,this system can provide a higher quality of service.Cloud computing system can automatically detect the node failure and exclude it,do not affect the normal operation of the system.
- c) *High security:*In the cloud computing model,data is stored intensively.Rely in go none or more data center,the managers manage the unified ,allocate the resources,balance load,deploy the software,control security,and do the reliable real time monitoring ,thus guarantee the users’data security to the greatest possible degree.
- d) *Virtualization:*Virtualization is the most important characteristics of this type of architecture.Each application deployment environment and physical platform is not related.It put the underlying hardware,including servers,storage and networking equipment,comprehensive virtualization,in order to build a resources pool of shared,distributed on-demand.
- e) The major advantage of the proposal is that it aims at providing easy access to expensive software running on high performance processors to rural students at institutions which lack considerable facilities.Considerable investment would be required to implement this architecture,but the benefits would easily justify the cost.This advantage can be visualized from the following Fig.5 This illustrates the connectivity tier of the proposed architecture.

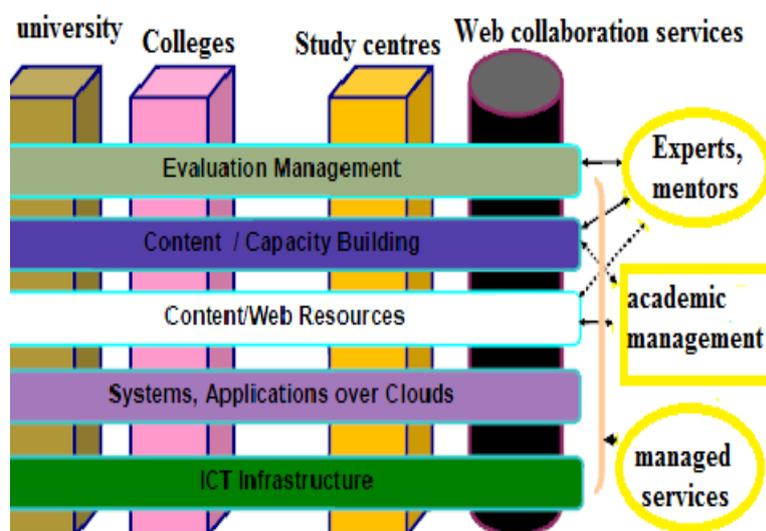


Fig.5 connectivity scenario of institutions in proposed architecture.

Integrating Faculty, student and administrator on a level playing field with the aid of cloud computing is shown in fig.6

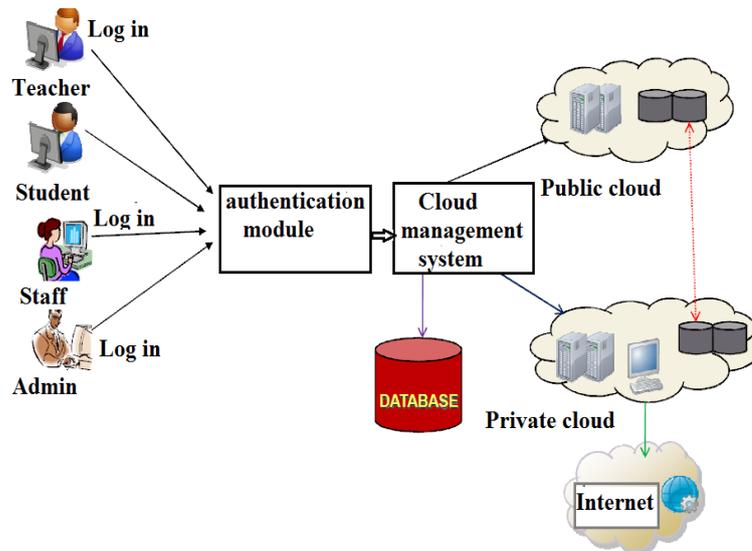


Fig.6 Interactive mode of the proposed architecture

VIII. Unique Features of Student Management Application

- Enlightening the high level management about the progress and participation of students.
- Notifications about attendance, academic profile and personal conduct of the students.
- Create a social enterprise environment between staff and students.
- Enabling staff to post reviews for students after evaluation in different aspects.
- Tracking all the details of students from various sites that are looking for overseas education and adequately assisting them to keep themselves abreast of the available opportunities.

IX. CONCLUSION

Being aware of incredible competition in different spheres of life, we realise that harmony among people in an organisation/institution and individual empowerment has become outstandingly imperative. Having said this, we firmly believe that the idea of effective assistance and productive interaction engaging students and management aided by cloud computing would be effective in impregnating synergy and integrity at institutions. Cloud computing over the years has been subjected to substantial exploration, but not to sound modest, it is believed that there is considerably a wide scope for development and research in aspects like platform security, technical standards, regulatory and other services well before it emerges out to be an impeccable technology.

ACKNOWLEDGEMENT

First I am grateful to God for giving me a chance to complete this work. This work is supported by K.Sripath Roy (Assistant Professor), ECE department of KL University. I am thankful to him and KL University for giving me continuous encouragement and great support.

REFERENCES:

- [1] http://www.wikininvest.com/concept/Cloud_Computing
- [2] DeCoufle B., The impact of cloud computing in schools, *The Datacenter Journal*, <http://datacenterjournal.com/content/view/3032/40>, July 2009
- [3] "E-learning based on Cloud Computing", Deepanshu Madan, Ashish Pant, Suneet Kumar, Arjun Arora Volume 2, Issue 2, February 2012 ISSN: 2277 128X, www.ijarcsse.com
- [4] <http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf>
- [5] Creeger M., CTO Roundtable: Cloud Computing *Communications of the ACM*, vol. 52, no. 8, august 2009, pp. 50-56
- [6] <http://www.ijpaper.com>, "Application of Cloud Computing to Academic Environment" Volume 03, Issue 03; Sep-Dec 2012, ISSN: 2230-8547; e-ISSN: 2230-8555
- [7] <http://en.wikipedia.org/wiki/E-learning>.
- [8] <http://www.e-learning.in/different-approaches-to-e-learning-services.html>
- [9] Paul Pocatilu, Felicia Alecu, *Using Cloud Computing for E-learning Systems*, Recent Advances on Data works, Communications, Computers. ISSN: 1790-5109, ISBN: 978-960-474-134-2.