

## The Cloud Learning System for Humanities

Sung-Ho Sim<sup>1</sup>, Hae-Gill Choi<sup>2</sup>

<sup>1</sup> Department of Liberal Education, Semyung University, Korea

<sup>2</sup> Dept. of Digital Media Engineering, Kyunghee Cyber University, Hoegi-dong, Seoul, 130-701, Korea

<sup>1</sup>shshim@semyung.ac.kr, <sup>2</sup>[hgchoi@khcu.ac.kr](mailto:hgchoi@khcu.ac.kr)

**Abstract:** Recently cloud computing technology was introduced for many applications and system to develop high performance use, fast and convenience design and implementation environment by many researchers. Learning system also changed from this IT trends. Learning materials and its processes are changing to apply their system mechanism and process as a services. This paper aims to develop learning system in cloud computing environment. All the learning process was assign in service level to SaaS layer, and learning system platform move to IaaS and PaaS layers. This research has a target to implement Humanities lecture. It is deal with general education course such as computer and human, convergence with IT and human life. We expect proposal research can be apply to next cloud learning system to advanced learning system's performance.

[Kharkwal G, Mehrotra P, Rawat YS. **Taxonomic Diversity of Understorey Vegetation in Kumaun Himalayan Forests.** *Life Sci J* 2014;11(7s):140-144] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 26

**Keywords:** Cloud computing; Learning system; C-learning; Humanities lecture

### 1. Introduction

Running scientific workflow applications usually need not only high performance computing resources but also massive storage. The emergence of cloud computing technologies offers a new way to develop scientific workflow systems. Since late 2007 the concept of cloud computing was proposed and it has been utilized in many areas with some success. Cloud computing is deemed as the next generation of IT platforms that can deliver computing as a kind of utility [1]. Cloud computing is a style of commercialized distributed computing in which dynamic scalable virtualization resources are provided as services to users over the Internet. Resources are distributed in physical, but are servicing in form of a single entity finally. Most cloud computing infrastructure architecture are such business models as IaaS (Infrastructure as a Service), PaaS (Platform as a Service) and SaaS (software as a Service) [2].

In other area, E-learning is a means of education that incorporates self-motivation, communication, efficiency, and technology. Because there is limited social interaction, learners must keep themselves motivated. The separation intrinsic to e-learning requires learners to communicate with each other and the instructor frequently to perform their assigned tasks. E-learning is competent as it eliminates distances and subsequent commutes. Distance is eliminated because the e-learning content is designed with media that can be accessed from properly equipped computer terminals and most frequently it seems to be used for web-based instruction so that learners can access online courses

via internet [3]. In the contents, basic questions that the Web Systems share with education are: Who are the students? What student's intentions and behaviours will be supported by the system? And, what devices will be used by students? E-Learning platforms solve these questions based on five different aspects: purpose, use, content, functionality and presentation. There are many learning platforms in web based learning system and it compare various aspects like: productivity, communication, participation of students, administration, content development, licensing, and the required hardware and software. Highlighting after such detailed analysis the communication and motivation as key factors in the student learning process, therefore the student should not be or feel isolated. Finally the authors sort the platforms in two types [4]:

- Those that are not attractive for most users, but at the same time they are fully developed and have most of the functionality needed by teachers and students.
- Those that are highly attractive, but do not provide a variety of services.

Cloud computing can be solution for this aspects.

In this paper, we propose cloud learning system for humanities lecture. This lecture is about the general education area. In the section 2, we discuss the cloud computing and education system. In the section 3, we describe the proposal method for e-learning system in cloud computing environment.

Finally in the final section, we summarize our contributions.

## 2. Cloud computing environment with learning

Cloud computing refers to an emerging model of computing where machines in large data centers can be dynamically provisioned, configured, and reconfigured to deliver services in a scalable manner, for needs ranging from scientific research to video sharing to e-mail. While usually described as a single entity, cloud computing can comprise several components at once: cloud infrastructure, cloud platform, and cloud application. Cloud infrastructure is the provision of a computer infrastructure as a service—both computational resources and storage—such as Amazon's Elastic Compute Cloud (EC2) and S3 services. This infrastructure allows users to configure the infrastructure themselves, including the rapid expansion of their infrastructure based on network requirements. Cloud platform is the provision of a computer platform or software stack as a service, such as Google's App Engine or Salesforce.com. Cloud applications are web services that run on top of a cloud platform or infrastructure and are made available to the organization's users or customers. They can include applications that are commonly known to the public including YouTube's video hosting applications and Google's Google Docs set of office applications [5].

Generally, the results of a survey that have

been completed in 2009 by Gartner analysts (Figure 1) about the IT trends (especially cloud computing) show that it is being used more in the areas of finance and business when compared to other sectors [6]. In the figure, we can see almost application use cloud computing technique.

Cloud computing structure can be describe as Figure 2. the lower layer represents the different deployment models of the cloud namely private, community, public and hybrid cloud deployment models. The layer just above the deployment layer represents the different delivery models that are utilized within a particular deployment model. These delivery models are the SaaS(Software as a Service), PaaS(Platform as a Service) and IaaS(Infrastructure as a Service) delivery models.

These delivery models form the core of the cloud and they exhibit certain characteristics like on-demand self-service, multi-tenancy, ubiquitous network, measured service and rapid elasticity which are shown in the top layer. These fundamental elements of the cloud require security which depends and varies with respect to the deployment model that is used, the way by which it is delivered and the character it exhibits [7].

E-learning includes instruction delivered via all electronic media, including: the Internet, Intranets, Extranets, satellite broadcasts, audio/video tapes, interactive TV, and CD-ROMs. In a narrow sense, E-learning refers to the use of Internet technologies to

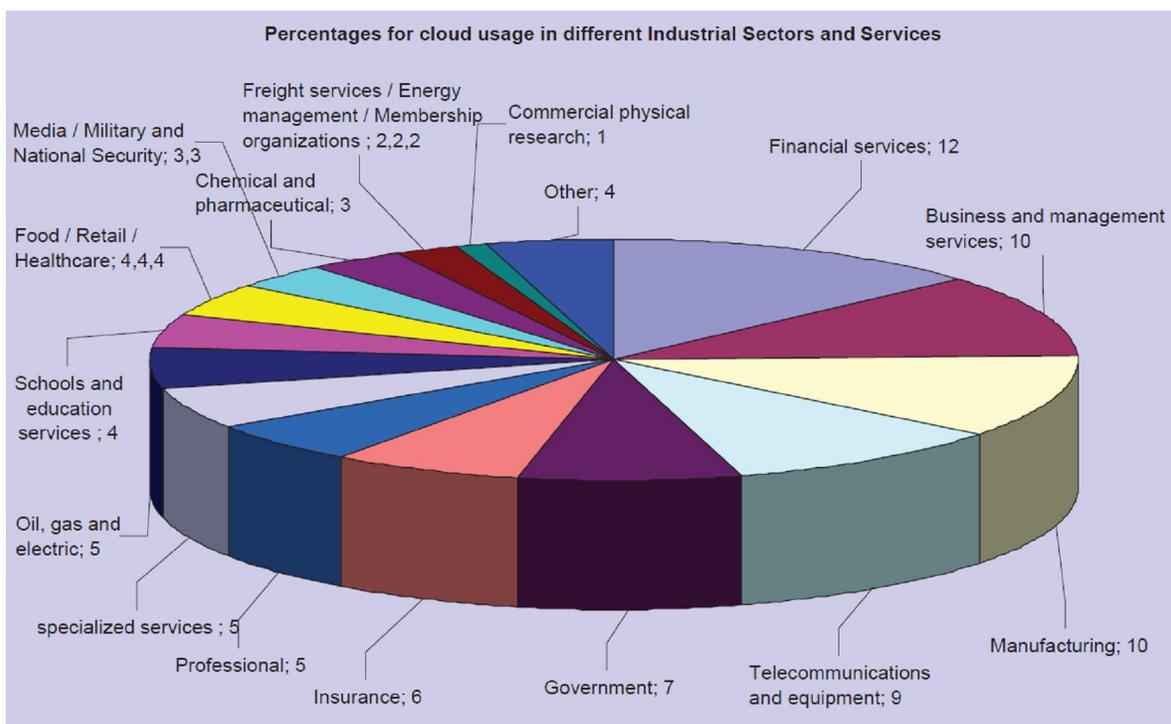


Figure 1. Cloud usage [6]

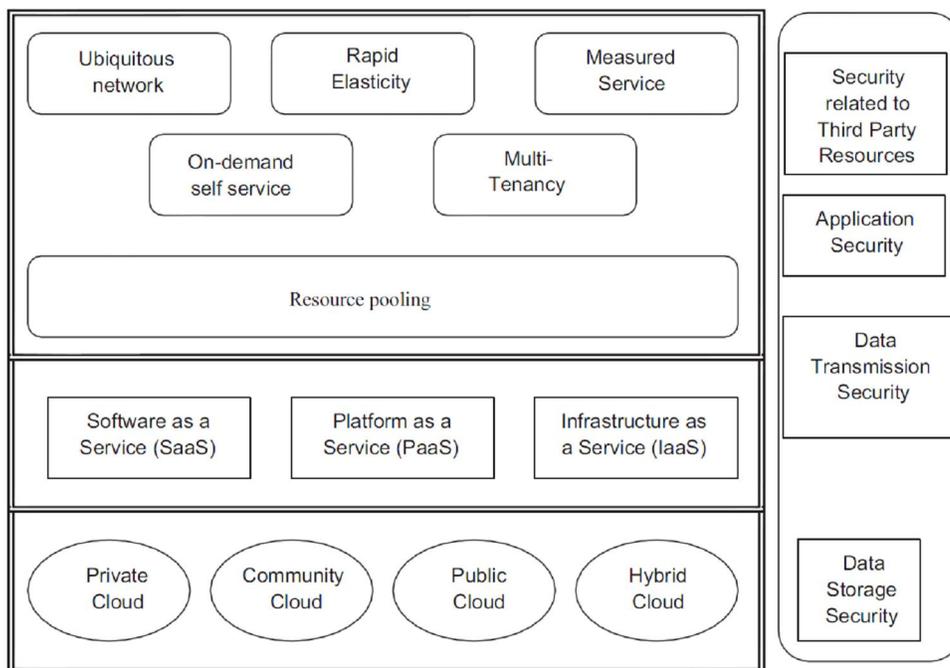


Figure 2. Cloud computing environment [7]

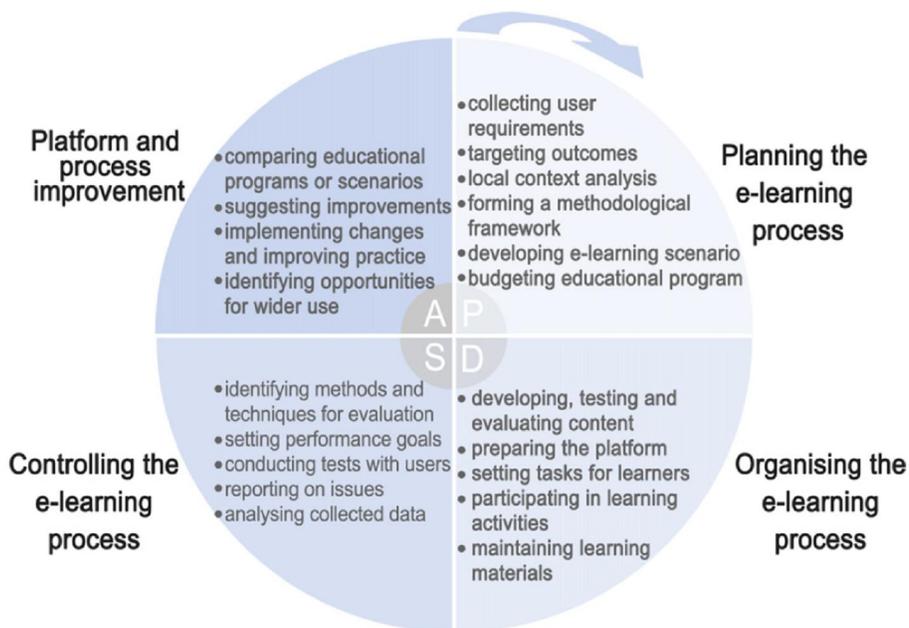


Figure 3. E-learning system model [9]

deliver a broad array of solutions that enhance knowledge and academic performance. Web-based courses are numerous and allow students to perform various learning activities in a virtual classroom [8].

Maja Cukusic, et al [9] shows e-learning system model as Figure 3. This model has four factors; platform, controlling, planning and organizing.

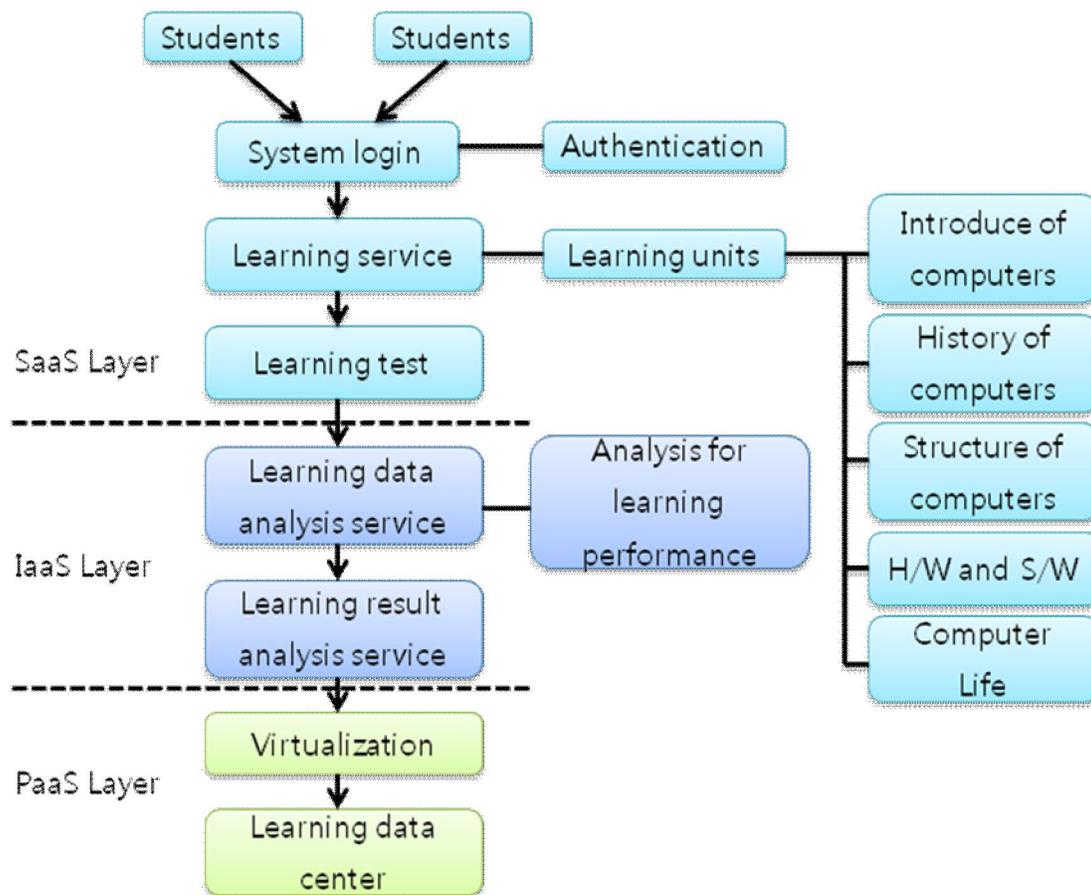


Figure 4. Proposed e-learning system in cloud computing environment

### 3. Learning System in Cloud Computing Environment

In this contents, we propose learning system for cloud computing environment. The target system is humanities lecture that is about computer science lecture in general education. Figure 4 shows proposal model structure for learning system in cloud computing by three layers. This structure has 4 layers as below.

- SaaS Layer  
System login  
Learning service  
Learning test
- IaaS Layer  
Learning data analysis service  
Learning result analysis service
- PaaS Layer  
Virtualization  
Learning data center

### 4. Conclusion

This paper proposed an advanced learning system model in cloud computing environment. The target system is humanities that is about computer science lecture. The learning units are consist of 5 process; Introduce of computers, History of computers, Structure of computers, H/W and S/W and Computer Life. It has 3 layers for SaaS, IaaS, and PaaS. Especially, in SaaS layer, almost learning application service is located in this layer.

We expect this research will contribute next and future cloud computing learning model.

#### Corresponding Author:

Dr. Hae-Gill Choi  
Dept. of Digital Media Engineering  
Kyunghee Cyber University. Hoegi-dong, Seoul,  
130-701, Korea  
E-mail: [hgchoi@khcu.ac.kr](mailto:hgchoi@khcu.ac.kr)

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4/28/2014