

# Role of Cloud Computing with Special Reference to Solving E-Learning Problems

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**Abstract**—The integration of ICT in education field according to the global trend which occupied a great interest in the world through E-Learning (Electronic Learning) techniques. which put it into the form of services within Services Oriented Architecture Technique (SOA) and mixing its input and outputs within the components of the Education Business Intelligence (EBI). Enhance it to simulate reality by educational virtual worlds. This paper describe a creative environment derived from both virtual and personal learning environment based on cloud computing, which contains variety of tools and technologies to enhance the educational process. The proposed environment focuses on designing and monitoring educational environment based on reusing the existing web tools techniques, and services to provide Browser based Applications.

## 1. INTRODUCTION

Here is much more debate among the education and E-Learning in the world, about the advantages and disadvantages of this system of education and most academic seminar papers presented concerned completely with the same topic which is the advantages and disadvantages to the comparison with the traditional educational system. In this paper I shall move from E-Learning evaluation to fly in the gape of implementations.

The problems are no longer to prove the importance of E-Learning but it is switch to E-Learning for most educational institutions collide the barrier of foundation when they plan to move the E-Learning system which requires many hardware, software and e- resources.

Cloud computing system is use to solve the E- learning problems. The educational clouds are provide a magic solution to the problem where any educational institution wants to upgrade its system to E-Learning system. Here is two choices whether to build its own/ private cloud or to go to the specific service provider to share information in the pubic cloud after defining some parameters.

All users are need a host in a data center somewhere in the world or even in multiple data centers scattered around the world and cloud computing providers deliver the common applications through online process that are accessed from web browsers also can provide a storage unit to store all the learners document.

No one can ignore the .NET Framework 2.0 technologies, which have changed the nature of the internet from a place to read static pages to an environment that allows end-users to access applications using web browser without purchasing licenses or without upgrade hardware where all software and files hosted in the cloud and accessed by wide range of devices such as smart phones, personal computers or PDAs while the internet connections is available.

The following sections are focus how to use cloud computing to enhanced the education process specifically in the world. The first section describe the cloud computing concept and its features, the second section describe the E-Learning environment based on cloud and the third section shows the comparison between existing sites to enhance the existing E-Learning sites.

## 2. CLOUD COMPUTING:

Cloud computing is Internet "cloud" based development and it is use of computer technology "computing". It is a style of computing in which dynamically scalable and often virtualized resources are provided as a service over the www or internet. Users need not have knowledge the of expertise or control over the technology infrastructure "in the cloud" that supports them. The concept incorporates such as "infrastructure as a service" (**IaaS**), "platform as a service" (**PaaS**) and software as a service (**SaaS**) as well as the Web 2.0 and other recent technologies trend which have the common theme of reliance on the Internet for satisfying the computing needs of the users. Examples of SaaS vendors include the Salesforce.com and Google apps which provides the common business application online that are accessed from a web browser, while the software and data are stored on the servers. The term *cloud* is used as a metaphor on the Internet based on how the Internet is depicted in computer network diagrams and is an abstraction for the complex infrastructure it conceals. Cloud computing plays a vital role in developing educational systems recently.

Cloud computing provides anytime / anywhere services which can be accessed from any device in such a way that users are not responsible for where the services or applications are

located or how it maintained or updated all this and more will be the responsibility of cloud computing service providers such as Google, Amazon and EC2 etc...

Cloud computing not only saves the money which is needed for upgrading many lab's hardware or purchase many software licenses but also it relieves the user from the periodic maintenance operations. It also provides a high level security and privacy.

But before transforming the E-Learning system to the cloud, the user should identify which services need and create a service catalogue {list of services you will provide to learners who will access your site} to determine the parameters you will need from service provider and also it will help you whenever you need to update your system. Recent research papers categorize the cloud services into two basic branches describe below:

**A. IT Services:**

IT services includes all the services related to the infrastructure of the cloud such as physical resources (as storage devices, school servers and national communication network etc.) and virtual resources which concern with the management and access of the physical resources.

**B. User Services:**

User Services can be divided into two types which are generic services (as E-Mail, search, portal, and social networking) and The Education services (as e-portfolio, content access and creation).

After determining the required services which serves the curriculum requirements provided by the institution to the students and teachers, a service level agreement will be established between the institution and the cloud provider to define the parameters that the institution needs.

**1) E-Learning Environment:**

There are many educational environments which serves the educational process based on computer and its technologies. For example Web 2.0 technologies which provide the teachers with new ways to engage students and help students to participate on a global level by using the network as a platform for the information sharing, interoperability, user-centered design and the collaboration on the WWW (World Wide Web).

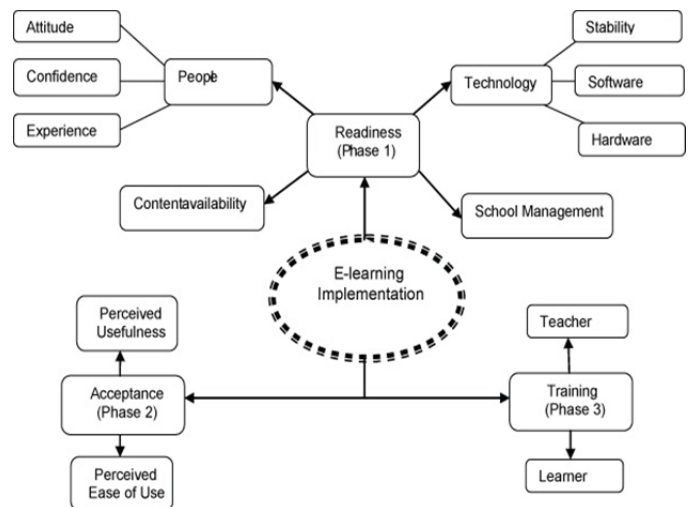
Web 2.0 sites allow the users to interact and collaborate with one another in a social media dialogue as creators of the user-generated content in a virtual community which helped the appearance of the learning environments such as virtual learning environment and the personal learning environment. Before designing a framework for E-Learning environment with the aid of cloud computing technology let's we know more about the pervious environments.

**a) Virtual Learning Environment (VLE):**

VLE is a set of teaching and learning tools designed to enhance a student's to learning experience by including computers and the Internet in the learning process where included web-based access to class content, grades, assessments, and other class tools. It is also a social space where students and the teacher can interact through threaded discussions or chat using different messengers. It also includes the students and the teacher meeting online through synchronous web-based applications. The teachers are able to present lessons through video, PowerPoint or chatting. The students are able to talk with other students and the teachers as well as collaborate with one another, answer a questions or pose questions. They can use the available tools through the application to virtually raise their hands or send messages or answer a questions on the screen given by the teacher.

**b) Personal Learning Environment (PLE):**

The expression does not refer to the specific service or applications but rather to an idea of how learners achieve their learning materials. PLE provide the learners with support in managing their contents and the communication with peers in the process of learning by dividing them into groups for discussions providing context and illustrating processes. After identifying the E-Learning environments and the recognizing features of each environment, we will move to the following section which is concerned with the outline a framework for the E-Learning environment with aid of cloud computing technology as shown in bellow at Fig.1.



**Fig. 1:- E-Learning Framework**

**2) Cloud-based E-Learning System:**

In this *Cloud-based E-Learning System* section concerns with the designing web-based E-Learning system that contains various social tools, smart agents and interactive environment of the web 2.0 techniques uploaded to the cloud as shown below in Fig. 2. The system has three major parts. The first part describe the web-based Course Management System

(CMS) which is managed by the web server for register learner to access course materials which are provided and maintained by teachers.

The second part is a PLE which provide various tools and services to help the learners in building their own environments. The third part addresses building of a Conceptual Overview of online virtual computing lab as shown in Fig. 3, Fig. 1 Site Map. providing a remote access service that allows the learner to reserve a computer with a desired set of applications and numerous windows environments and remotely access it over high-speed internet connection.

All of this are shown through an attractive easy-to-use interface represented in a Learn my way web interface which achieves a set of criteria to facilitate the students' tasks as shown in fig. 2.

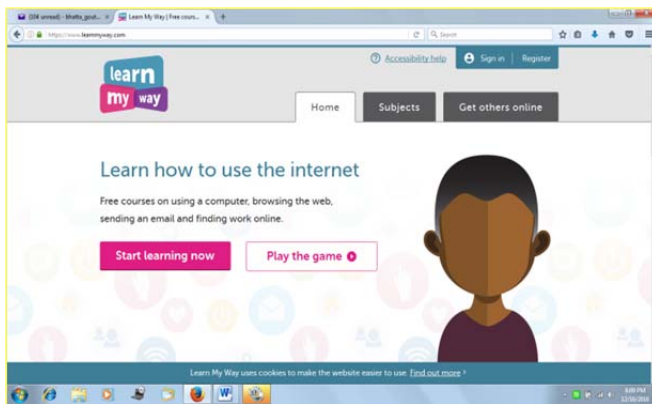


Fig. 2:- Learn my way Web Site, Homepage.

Learn my way achieves the learning objectives of Education and teacher-defined course goals.

- Learn my way provides the means to deliver high quality digital learning applications which fully integrated into any course. Learners learn by access text and multimedia contents.
- Learn my way provides both teachers and learners the ability and storage area to upload all their documents, projects, homework and photos at their fingertips for the registered members.
- Learn my way provides the technology, tools and professional development that facilitate the students' task and help them to share and present their ideas, thinking and learning by using Learn my way forums.
- Learn my way provides the technology, tools that helps students to access their virtual computing lab to implement their educational activities by providing a number of Windows and Linux environments and set of suggested programs.

- Learn my way provides the students with online test which provide various questions on various topics to improve the students' skills.
- Learn my way provides learners the ability to follow up their performance level by assignment report, progress report, working portfolios, and projects Evaluation.
- The user interface is friendly, and accessible.

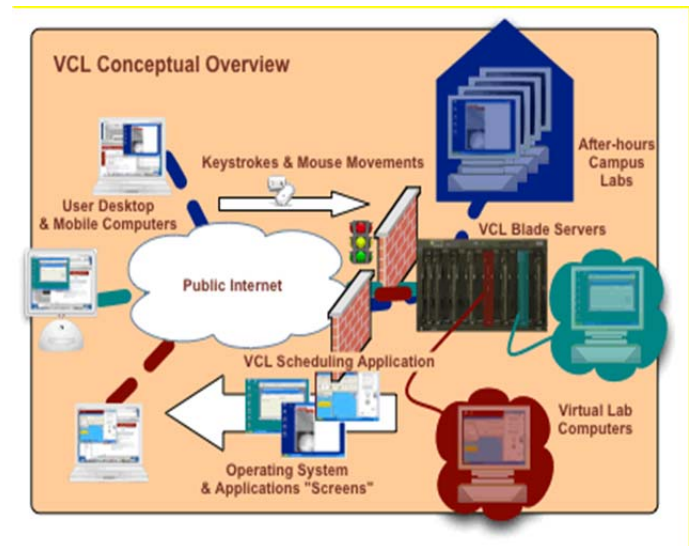


Fig. 3: The Conceptual Overview of Virtual Computing Lab

### 3. CONCLUSION

In this paper I tried to prove that the cloud computing changed E-Learning future systems. wide world of knowledge and tools now is available to the teachers and learners through cloud based services at all the times and accessed from anywhere, from any device.

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