Cloud-based E-Learning Integrated Approach

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Abstract

This study presented the Cloud-based E-learning Integrated Approach which is the integration of different e-learning resources such as: classroom content, e-learning educational portals, and e-learning resources in the cloud. The authors briefly discussed the steps such as course development, integration approach, intellectual property, assessment and articulation. This approach addresses the challenges that the e-learning systems have. First, when it comes to infrastructure, the cloud-based e-learning is cost-effective. Second, the human resources - there is no need much because the learning materials can be out source in other company and open source learning management system (LMS) like Moodle is available. Third, the maintenance - cloud based service provider has its own maintenance, and IT infrastructure for university is not much needed.

Keywords: E-learning, cloud computing, LMS

I. Introduction

There has been increasing interest for cloud-based e-learning this is due to the introduction of Cloud-Based Learning Management Systems. This technology brought many advantages to the side of the learner and the instructor. Easy and fast creation of online learning lessons and easy access from the users is one of the features that convince the customers to use the cloud-based LMS. There are some flaws that must be addressed before there is full integration of e-learning in the university [1][2].

With the emergence of increasingly robust connectivity infrastructure and cheaper computers, school systems around the world are developing the ability to provide learning opportunities to students "anytime, anywhere" This trend requires a rethinking of the traditional one hour lesson. In addition to hardware and Internet access, it requires the availability of virtual mentors or teachers, and opportunities for peer to peer and self-paced, deeper learning [3] [4].

The advances in information and communication technology brought societal change and along with these changes the demand for more optimized learning avenue become options to many [5] [6].
E-Learning provides many benefits such as flexibility, diversity, measurement, and others, even though its implementation still exist many difficulties. The main problem experienced when to start applying e-learning is the high initial cost or in other words is the economic factor. It is becoming a major focus for the institutions that will implement e-learning [7] [8]. The initial cost consists of three main problems: Infrastructure; Human Resources; Maintenance. Another problem might occur when implementing e-learning is access to the learning material. Along with the development of the IT world, cloud computing is gradually become the new paradigm of innovation in the IT world, cloud computing is a computing services that can be used through the Internet in accordance with the needs of users with little interaction between service providers and users. Cloud computing technology as well described as a computing resource that provides a highly scalable as external services through the Internet. Therefore, cloud computing can be considered as an alternative to minimize the cost of infrastructure and human resources for development and maintenance process of e-learning systems [9][17].

This paper is organized as follows: First section is Introduction, second section is background, section three (3) Challenges, and section four (4) the cloud-based e-learning integrated approach (5) Conclusion and Future Works.

II. Background of the Study

2.1. E-Learning Progress

Figure 1 show the comparison of the three (3) learning trends in terms of information and communication media and learning environment and opportunities. The learning concepts shift as fast as we could never imagine before [10][19].

![Fig. 1. Progress in learning paradigm [19]](image)

2.1.1. E-Learning

E-learning comprises all forms of electronically supported learning and teaching. The information
and communication systems, whether networked or not, serve as specific media to implement the learning process. The term will still most likely be utilized to reference out-of-classroom and in-classroom educational experiences via technology, even as advances continue in regard to devices and curriculum. It uses standard tablet/laptop PC with wireless and landline network cards [11] [19].

2.1.2. M-Learning

An m-learning environment can extend the availability of the e-learning environment. The m-learning objectives may be just those of the e-learning environment, and may only support a sub-set of the e-learning objectives. Of course, mobile devices have technical capabilities which are additional to and distinct from those of desktop devices, and these should be exploited, where appropriate, to attain further educational goals. Uses pocket PC/phone/PDA with radio local network connectivity and/or GPRS access [12] [19].

2.1.3. U-Learning

The term “ubiquitous learning environment” is from the term “ubiquitous computing”, used to describe the moving of general computing off desktops and into many devices, to make computing available in all facets of everyday life. Handheld computers with Internet access, provide an opportunity for developers to explore and implement u-learning environments. The addition of the mobile component can extend the availability of the desktop environment, and exploit specifically mobile technologies for identifiable educational aims [13] [19].

2.1.4. Location Based Service Ubiquitous Learning

Location based service ubiquitous learning is “anytime, anywhere” learning service. People in the park, museum, in the house or in any public area that learning is needed like for example in finding a certain store you can use your mobile phone to locate the exact location by answering series of questions and with the help of the positioning system [14][19].

2.2. The Future E-Learning

E-learning is here to stay. As computer ownership grows across the globe e-learning becomes increasingly viable and accessible. Internet connection speeds are increasing, and with that, opportunities for more multimedia training methods arise. With the immense improvement of mobile networks in the past few years and the increase in telecommuting, taking all the awesome features of e-learning on the road is a reality with smartphones and other portable devices [14] [15] [19].
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Technologies such as social media are also transforming education constantly. Generally speaking, learning is expensive, takes a long time and the results can vary. E-learning has been trying for years now to complement the way we learn to make it more effective and measurable. The result now being that there are a number of tools that help create interactive courses, standardize the learning process and/or inject informal elements to otherwise formal learning processes. Several e-learning trends give us a view to how e-learning and learning tools will be shaped in the future: Micro-learning, Gamification, Personalized Learning. The distant future: Automatic learning.

2.3. Learning Platforms

LMS stands for Learning Management System and it's a global term for a computer system specifically developed for managing online courses, distributing course materials and allowing collaboration between students and teachers. A LMS will allow you to manage every aspect of a course, from the registration of students to the storing of test results, as well as allowing you to accept assignments digitally and keep in touch with your students. In essence, the LMS is the backbone of most e-learning activities [21].

2.4. Advantages of using cloud-based e-learning system

The lack of data security, unreliable access, and the absence of IT support resources are some disadvantages of using cloud-based e-learning system. However, some advantages are worth considering. These are the following:

* Easy to setup and maintain.
* A cloud based e-Learning platform is cost efficient.
* Improves employee retention.
* Allows for seamless collaboration in the distributed workforce.
* Grows with the company’s ever-evolving training needs.
* Cloud based e-Learning platforms are dependable.
* No internal IT support is required.
* Cloud based e-Learning platforms are safe.

E-Learning system based on cloud computing infrastructure is feasible and it can greatly improve the efficiency of investment and the power of management, which can make E-learning system development into a virtuous circle and achieve a win-win situation for suppliers and customers.
The introduction of cloud based e-learning management system has brought a good impact to education.

Several e-learning educational portals, e-learning resources are being used today. Some of these are Khan Academy, Udemy, Ted Talks, Coursera, Open Study, Academic Barth and Freelanceteachers.com.

The issue of granting the college or university credits is not yet addressed. Though online courses are useful for lifelong learning or continuous education, it is not counted for formal education. Thus, the approval for credit to degree-granting institutions is needed to bridge between the gaps. This study aims to introduce the cloud-based e-learning system for university. The LMS is to be utilized by universities to support online distance learning courses. It would be useful to have standard LMS for university usage. The university can offer online courses with much more organized and standardized instructions.

Mostly of the cloud-based e-learning management system nowadays are used by private companies and it becomes a business.

The use of LMS is growing fast, as part of lifelong learning. Many scholars, entrepreneurs participate in these courses, usually for continuous education and self-training for specific area. These online lessons are for fee but some are for free. The LMS platforms are seen to be easy, fast and all in one usage. It supports multimedia (audio, video, text, image and others). Many forms of learning tool platforms and tools have been introduced, yet the practical use for university students for distance learning is not largely in practice.

III. Challenges

The transfer of course credit between schools for equivalent courses, between virtual universities and traditional degree granting institutions has to be addressed. Institutional challenges to implementing effective e-learning tend to be top-level and strategic. First, an institution must face the initial costs related to technology, infrastructure, and training. An adequate communications infrastructure goes without saying where the speed and reliability of a network are vital to success. This issue, however, has become nearly obsolete in much of the world and remains important only in some developing countries. Nor are technology costs any longer an issue for most institutions and learners as the price of the software needed for web-based teaching has fallen rapidly. This is even more so for large state or public universities since they can typically negotiate advantageous licensing terms. The software associated especially with e-learning 2.0 may cost virtually zero many of the most popular applications are free or open source such as wikis, Moodle, and the various social networking tools. Perhaps the only remaining significant initial cost today is faculty, staff, and student training. But that too tends to fall over time as the tools used
for web-based learning increasingly become standard practice [21].

IV. Cloud-based E-Learning Integrated Approach

In comparison public institutions often have a mandate to provide subsidized educational services to less fortunate populations. One approach that has been tried is for e-learning companies to form partnerships with educational institutions to develop institutional content into online courses and to provide technology, in exchange for the ownership of the online content. Even though the institution is allowed to use the courses at no cost, few if any of these partnerships have survived to the current day [19]. A popular business model for providing e-learning is to find groups such as corporate managers who pay for an online course. The figure 2 is the cloud-based e-learning architecture.

The cloud-based E-learning Integrated Approach aims to integrate different course materials from different e-learning portals such as Khan Academy, Udemy, Ted Talks, Coursera, Open Study, Academic Barth and Freelanceteachers.com. Different multimedia resources (videos, audios, text and graphics) can be integrated to develop e-learning course materials which are deployed in the cloud. These approaches of preparing the e-learning materials are cost effective and easy to integrate.

A cloud-based e-learning Integrated Approach is the integration of different e-learning resources such as classroom content, e-learning educational portals, and e-learning resources in the cloud. There are several steps that have to be followed, these are the following: course development, integration approach, intellectual property, assessment and articulation.

4.1. Course Development

Course Development process includes the mapping, decision of the curriculum and the available
e-learning resources from different e-learning educational portals and the classroom contents. About two or three times more work is required to set up an online course than a comparable course taught in a classroom. The amount of work and the cost can be much higher depending on the amount of multimedia incorporated into the course. For those institutions that have content in the form of existing traditional courses, the challenge is whether it is better for the organization to develop this into online courses using in-house resources, or to have an outside company do it. The design of a course template and assistance in the form of "surrounds" or supporting services, such as online chat and webcasting, may be obtained from private companies. Purchasing services or entering into an agreement with these e-learning companies focuses attention to costs, the quality of the course and intellectual property [21][24]. The cloud-based B-learning Integrated Approach aims to integrate different course materials from different e-learning portals. Different multimedia resources (videos, audios, text and graphics) can be integrated to develop e-learning course materials which are deployed in the cloud. These approaches of preparing the e-learning materials are cost effective and easy to integrate.

4.2. Integration Approach

The integration approach of different e-learning resources would require permission to the copyrighted resources, the selection and mapping of the right contents. Several e-learning educational portals, e-learning resources are being used today. Some of these are Khan Academy, Udemy, Ted Talks, Coursera, Open Study, Academic Earth and Freelineteachers.com. It also may require the reinforcement of the intellectual property right. The different learning materials can be integrated using LMS programs like Moodle.

4.3. Intellectual Property

The agreement for the Intellectual property must be reinforced. There are several e-learning contents, resources that being used. Prior to online learning, it was agreed that instructors owned the content of their courses. Now some institutions claim to own the content, probably because it sees the material as a potential long-term revenue source. Technology partners of the institution may own the technology that delivers the course - in other words co-own the course, since the content can't be easily separated from the technology. In fact the institution may have an agreement with the tech provider and can't separate the content and technology.

4.4. Assessment
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The e-learning module should meet a certain grade of assessment to be certified e-learning module of a certain course. Assessment may eventually show that virtual education is as good as the traditional approach, although it could point to differences depending on the material covered and the type of student. Attempts to teach certain types of courses online could be abandoned, whereas other courses could move from the classroom to cyberspace at the student's convenience. It also follows that an integrated approach may be the best approach for certain material. The initial cost consists of three main problems: (1) Infrastructure; (2) Human Resources; (3) Maintenance. Another problem might occur when implementing e-learning is access to the learning material. This approach addresses the challenges that the e-learning systems have. First, when it comes to infrastructure, the cloud-based e-learning is cost-effective. Second, the human resources - there is no need much because the learning materials can be outsource in other company and open source learning management system (LMS) like Moodle is available. Third, the maintenance - cloud based service provider has its own maintenance, and IT infrastructure for university is not much needed [21][22][24].

4.5. Articulation

A challenge for e-learning is how articulation, the transfer of course credits between schools for equivalent courses, occurs between virtual universities and between virtual and traditional degree granting institutions. A particular concern is how to handle individuals who, for various reasons, are not in a degree-granting program but want to transfer their course credits into one [21] [24]. Articulation is important. There must be a standard regulation to transfer the e-learning lessons to course credits between schools for equivalent courses.

![Fig. 3. Cloud-based E-Learning Integrated Approach process](image-url)
V. Conclusion and Future Works

This study presented the cloud-based e-learning integrated approach, which is the integration of different e-learning resources such as classroom content, e-learning educational portals, and e-learning resources in the cloud. The authors briefly discussed the steps such as course development, integration approach, intellectual property, assessment and articulation. The integrated approach for developing an e-learning course is believed to be easy and cost effective.

The future works of this study includes the deeper study of the standard regulations for intellectual property, Articulation and implementation.

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