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SAAS EXPLOSION LEADING TO A NEW PHASE OF A LEARNING MANAGEMENT SYSTEM

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ABSTRACT

Cloud computing is still a baby having compound eyes with omnidirectional vision. It is slowly embracing all possible sectors and eLearning technology gaining more benefit out of it. The essential characteristic of cloud computing is easy and timely access to the required information. Education has seen a lot of changes from the ancient Gurukula stage where students had to go to the master for a particular period of time to study and to complete their learning. As the time pass by the learning became central many big educational systems evolved through Schools, Colleges and Universities, to impart knowledge. These learning centers offered face-to-face learning. Even further blended learning helped student understand, innovate, and implement faster. With the advent of Learning Management Systems teaching and learning becomes effortless. A distinct stage of development in the field of LMS is Cloud-based LMS wherein time is not at all a constraint. This paper covers interesting aspects of E-learning-Cloud/SaaS LMS, different standards pertaining to LMS, and types of LMS. The authors analyze the case studies of MOODLE, BLACKBOARD and SaaS-based LMS and a comparison of SaaS vs. Installed LMS's.

Key Words: SCORM, AICC, IMS GLOBAL, IEEE, MOODLE, BLACKBOARD, TALENTLMS, HACP, Tin Can, G-Cube

INTRODUCTION

The education and business are the fields which are gaining a steady growth due to the advent of new technologies such as e-learning and similar forms. These technologies are used for the advancement in terms of teaching and learning. Every year we are witnessing new applications to cater to the needs of the education in the form of cutting costs and expanding accessibility. Not only the students and teachers benefitted however, the employee efficiencies are boosted, managements looking for a revolution (Brian Westfall, 2015)[9]. Training no longer time and place dependent; learners can share ideas, infrastructure and tools. Thanks to cloud-based learning management systems, today instructional designers can create courses that are more cost efficient and more accessible. The benefits of the cloud-based learning management systems are mostly grabbed by employee-training rather than academics.

Learning Management Systems are several; it is all up to the user to select. The types are open-source, proprietary, and cloud-based. Open source and proprietary require infrastructure locally and depends mainly on time for installations, configurations, incur cost. The Cloud-based LMSs comes handy for small and large organizations. Since the LMS is stored on a cloud no need to manage the software. User needs to login, create the course content and distribute the courses. The system has the ability to store documents and arrange data that can be created in Excel or PDF reports. One can access the cloud by a variety of internet on devices even through the mobiles (Henson Gawliu, 2014)[8].

LEARNING MANAGEMENT SYSTEM

Managing curriculum, training is the basic essential part of the education system. This has been the challenge from ancient times. For the past 15 years a rapid revolution took place in the field of education. Learning environment becoming digital and powerful software systems such as Learning Management systems have been emerged; capable of managing curriculum, training material, assessment and evalua-

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tion tools electronically. It allows organizations to develop intelligent eCoursework; and deliver it with unmatched reach and flexibility. Nearly a billion-dollar industry, LMS products are associated with ease-of-use and can be a life-long learning as it is impossible with conventional learning. Today's classrooms are changing dramatically with the aid of LMS offering a modern user interface.

The Learning management systems are hosted on the internet and can be accessed by logging into a service provider's site. This does not need any installation, of course design and management software. Instructional designers simply use Internet browsers to upload course content, create new courses and communicate with the learners directly. The entire setup is secured so that the designers can store information in the cloud, which can be remotely accessed by authorized users.

NORMS OF LMS

A) SCORM standard is a result of Department of defense's Advanced Distributed learning (ADL) initiative. The purpose of the ADL is to ensure access to high-quality education and training materials. SCORM-compliant courseware elements are easily merged with other compliant elements to produce a highly modular repository of training materials (David Boggs, Cyber works). The standard uses XML, and it is based on the results of work done by AICC, IMS Global and IEEE.

SCORM Stands for "Sharable Content Object Reference Model", and it is a standard to develop e-Learning software particularly Learning Management System. This is a model containing set of technical Specifications and procedures for building e-Learning software. When applied to e-Learning Course content, produces small, reusable e-Learning objects. SCORM enables interoperability between e-Learning software products. The online learning content and LMS software communicates with each other to bring the specific courses to the learner; the SCORM facilitates to do that.

SCORM has several modules such as Content Aggregation Model (CAM), Run-time Environment (RTE), and Sequencing and Navigation (SN). These modules are the core of the SCORM.

There are various LMS supporting SCORM: They are Blackboard, Contento LMS, DLMS, DoceboLMS, Dokeyos, and Moodle etc.

B) AICC started in 1988 by Aircraft manufacturers to address Airline concerns about e-Learning training materials. A series of development took place and it has now been the one of the standards of e-learning. AICC stands for Aviation Industry CBT Committee and primarily uses HACP (HTTP AICC Communication Protocol) Protocol to provide communication between the course content and LMS. In comparison with SCORM, AICC is older. Both are efficient and SCORM is more user friendly. Features of AICC are same as of SCORM.

These standards provide Interoperability, Durability, Accessibility and Reusability of learning objects. Apart from SCORM and AICC, the other e-Learning standards are xAPI or Tin Can, CC/LTI and CMI-5 (e-Learning Chef, 2014)[4].

MOODLE AS AN OPEN SOURCE LMS

Moodle is free, open source software learning management system written in PHP (Hypertext Pre-Processor). Moodle is used for blended learning, distance education, and workplaces (Martin, 2003). A Moodle acronym for Object-oriented dynamic learning environment allows for extending and tailoring learning environments.

Fig 1: A sample Screen shot of Moodle (Curtesy : Moodle)

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A Sample Look on the Moodle Screen as shown in fig 1. A flexible tool sets called plugins allow moodle users to extend the features. There are over thousand plugins available for moodle as per the new moodle report. Graphical themes are used to change the look and functionality of a moodle site or of an individual course. People in different countries can use moodle in their languages. There are over 100 Languages moodle supports. Even through mobile moodle can be accessible. Moodle adopted a number of eLearning standards such as SCORM 1.2, Tin Can and AICC (Aviation Industry Computer-Based Training Committee), and LTI (Learning Tools Interoperability). Moodle can be deployed through the Apache HTTP server; a number of database management systems such as PostgresSQL are supported. Different platforms like Microsoft Windows and Macintosh are moodle supported. Moodle can be portable to UNIX, Linux, FreeBSD, Windows, Mac OS X, and Netware without any modification. In the higher education sector moodle is the second largest provider with a 23 % market share following Blackboard with 41%. In the corporate market the sixth largest LMS providers constitutes approx 50% of the market (Forbes, 2015)[2]. Moodle has released about 20 different

versions. The new release is expected by the end of 2015. According to the survey conducted in 2014 by Technology enhanced learning in higher education in the UK, Moodle tops the table with most aspects.

BLACKBOARD AS A COMMERCIAL LMS

Blackboard LMS established in 1997 and owned by Blackboard; it is an online Virtual Learning Environment (Yefim Kats, 2013)[6] Blackboard LMS provides Enterprise software applications as well as services for learning and development. It can be used for small and medium sized business associations and government agencies. It can be deployed based on customer need. Blackboard comes in flavors such as Installed version, web version, and even a mobile version. It offers training through webinars, live online, documentation and in person. It supports any types of rich media from computer or from a mobile. End user license agreement is required for the use; slightly expensive, US-centric, rigid design.

SAAS BASED LMSS

The Present buzzword across the world is eLearning. Specifically the SaaS-based LMS is getting popularity constantly. The SaaS-based LMS can also be called as Web-based or Cloud-based LMS. Most organization's human resource departments are thinking to adapt the technology to save the valuable resources instead of spending money for training their employees conventionally. New Employees will get their training from their home or wherever they are there. Not only the training, however the evaluation of the employees is done using LMS software. Even academic administrators are able to open their branches worldwide to provide courses through online. Some of the Cloud-based LMS is Digital Chalk, TalentLMS, Sky Prep, LitmosLMS, FirmwaterLMS (Stephanie Miles, 2013)[5].

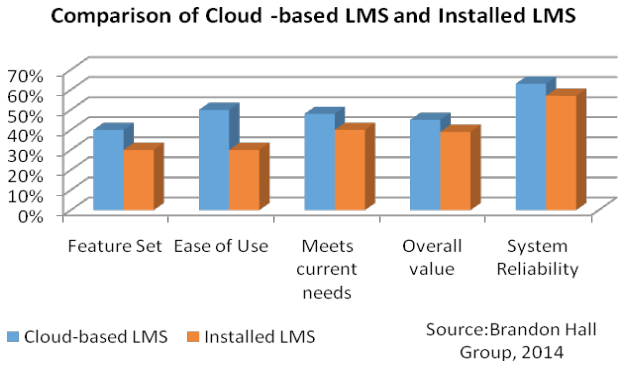

Figure 2

A report published by Brandon Hall Group, 2014 shown in fig: 2 clearly indicate the upper hand of Cloud-based LMS with certain parameters over Installed LMS's.

Cloud-based Learning Management System (LMS) usage is a key trend in the market. With growing competition, companies are trying to remain competitive with the help of a skilled workforce and for this; they are using cloud-based LMSs to provide training at substantially reduced cost. The technical barriers to LMS implementation has become a major challenge for the market. Users are facing difficulty while installing an LMS in their organization, as they are unable to customize it as per their requirements (Research and Markets, 2015).

IT companies earlier concentrated more towards corporate business, now most of the IT companies are geared up towards building tools for education. Google tools and apps have started to provide the means to create educational material without any start-up cost. These kinds of systems are aimed at innovative education and at reasonable cost. Especially cloud-based LMS is better in all aspects compared to commercial LMSs such as Blackboard, and open source LMS Moodle. However, user interface and navigation needs to be improved. That will definitely be reflected in the future, upgrades and releases (nghudson, 2015).

Cloud solution is better than the open-source because the data and process activity is housed on external trusted servers, offers, services scalability, training can be anywhere anytime however a high speed Internet connection is required. Cloud-based solutions can be applied to virtually every type of content distribution. Cloud based LMS provides a blended learning through a virtual classroom environment through Skype.

The reasons for organizations switching from conventional LMS to Cloud-based LMS environments are firstly, due to the additional features being incorporated in the cloud are readily available to every user. Secondly, there is an adequate support to the users. Thirdly, the user need not worry about technical aspects of LMS.

EFFECTS OF CLOUD-BASED LMSS

Cloud Technology is being used in various fields due to its simplicity and user satisfaction. The education field is not far behind in this sense. Cloud-based LMSs have better effects than the installed ones. There are various effects which highlight cloud-based LMSs are:

(a) No Initial Expenses: No panic for users and they need not worry about purchasing the software, installations, configuring systems network-wide. This reduces the initial cost by a big margin. The Instructional designer only needs to sign up with the LMS service provider and begin creating content and courses, irrespective of small or a large company the cost incurred is the same.

(b) *Robust Data Security*: People often use social networking sites such as Facebook, Twitter and similar kind of applications to communicate with the collaborators[7]. Of course, these free sites do not have the security features offered by a cloud-based LMS. Even then there is no worry. The cloud-based LMS platforms are well secured and safe to use. The LMS service providers employ a series of methods to ensure security and privacy of the data stored with utmost importance. Most of these systems are better encrypted using the SSL protocol. A strict authentication procedure is followed in order to allow only authorized users. Online payment transactions are done through PayPal and payment processors.

(c) *Improved Accessibility*: There are two kinds of users who access cloud-based LMS, learners and instructional designers. Instructional designers can use any internet-ready device to upload content and communicate other collaborators and learners. For Learner training is independent of place and time. They simply log into their LMS account and start learning new skill sets and expanding their knowledge base, without limitations.

(d) *Rapid Deployment*: Here there is a need to differentiate the deployed vs. cloud-based LMSs. In normal deployment the worry part is the setup; it requires different hardware and software are to be configured and takes much of the time and effort. On the other hand the cloud-based eLearning is faster to setup and requires less time to actually deploy. The instructional designers just have to sign up with a cloud-based service provider once and allow learners access it. The training sessions can be started immediately and begin offering courses to students.

(e) *Storage Space*: Put an end to corrupted hard drives or permanently deleted files. Since the all the information is stored in cloud including images, content, will be uploaded directly to the LMS and in turn frees up space on local devices. Users such as content creators, collaborators, will be able to share information with ease and these are stored on a remote secured server.

(f) *Cost Predictability*: In Cloud-based LMSs tariffs are very much clear that means the cost per monthly or quarterly, or half yearly is known. Organizations have a clear picture on money to be invested in. There are typically different hosting and service packages; based on the need the respective package can be selected. The administrators have the ability to choose between the tariff plan.

(g) *Easier to Maintain*: Basically there are no maintenance and service providers solve each and every issue then and there. The new features and upgraded functions are available to the end user on a regular basis. The organizations can concentrate or devote IT resources to other aspects.

(h) *Fully Customizable and Scalable*: Cloud-based LMS is an advantage to organizations in training their employees, be it for small or large companies. The training Programs can be easily customizable according to the need and organizations expands their learning environment without much of the investment[10].

SIGNIFICANCE OF DIFFERENT LMSS

(a) Talent LMS: This is a SaaS eLearning platform or cloud-based Management system. This is currently aimed at training employees of small, medium and large companies. This platform offers tools for content creation, re-purposing, test building, assignment management, reporting, internal messaging and discussions, surveys. Presently, this product is used by over 20,000 organizations and business world-wide, including education, retail, construction, public sector and nonprofit companies.

(b) Litmos: It is used for corporate training. 1.6 million Users worldwide, including technology, education, retail, public sector and non-profit companies. The most user friendly enables rapid creation of web based courses and easy distribution to learners of all kinds. There is no social learning aspect.

(c) WizdomLMS: This product is from G-Cube with over a million users and offers two flavors such as online as well as offline courses. Users can choose between the options. It prioritizes the ease of use, lightweight structure. It has won many awards, including Brandon Hall award and LearnX awards.

(d) Mindflash: This is a cloud-based LMS contains features such as course preparation, corporate learning. However, doesn't support standard like SCORM. Automatic conversion of PowerPoint, Video, Word or PDF files into an online course are possible.

(e) ScholarLMS: It is a cloud-based; Tin Can enabled learning management system based on the world's most popular open source virtual learning environment (VLE). Free for startups and nonprofits.

(f) VTA Talent Management Suite: This product from RISC integrates training, assessment and robust reporting to support the needs of organizations spanning multiple-sites, languages and currencies. RISC is a technology innovator as a Tin Can early adopter and a cloud LMS provider since 1999 supporting hosted sites on six continents in a number of heavily regulated industries.

FUTURE OF CLOUD-BASED LMS

The Cloud-based LMS and installed LMS, both have a very bright future. A recent research study (eLearning Industry, 2015) indicates about 87% of organization choosing Cloud-based LMS. This shows very good prospects for Cloud-based LMS in the future. The reasons we have discussed in the effects of cloud-based LMS. In addition to that the framework provides privacy within a teaching environment for instructors as well as students. It provides flexibility to accommodate a variety of teaching styles. More importantly, it provides greater accountability and transparency demanded by institutions[7].

CONCLUSION

The association of E-Learning and Cloud-computing is well-composed and it has promoted the knowledge sharing to greater heights. Students and Teachers can exchange their thoughts by sitting apart far distances with no time restrictions. The reuse of learning objects is another important feature of LMS thereby reduces redundant work. We have seen a steady growth of Cloud-LMS and it is the best among other forms of LMS's. Finally, the Cloud-computing paved way for the e-Learning significantly.

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REFERENCES

1. Julie Voce, Joe Nicholls, Elaine Swift, Jebar Ahmed, Sarah Horrigan and Phil Vincent, 2014, "2014 Survey of Technology Enhanced Learning for higher education in the UK". UCISA Richard Walker.
2. Bersin, Josh., 2015, "Talent Management Software Market Surges Ahead". Forbes. Forbes. Retrieved 13 April 2015.
3. E-Learning India, 2014, "SCORM and AICC – A Comparison", E-Learning Articles.
4. eLearning Chef, 2014, "AICC,SCORM,xAPI,CC/LTI,CMI-5… What does it all mean?"
5. Stephanie Miles. 2013, "Cloud-Based Learning Management Systems", GetApp.
6. Yefim Kats, 2013, "Learning Management Systems and Instructional Design: Best Practices in Online Education", Idea Group Inc.
7. Arunima Majumdar,2014, "Benefits of the Cloud LMS – Is it the future of Learning Management Systems?", G-Cube.
8. Henson Gawliu Jr, 2014, "Cloud-based LMS - 4 Reasons Why is it Important?", LITMOS.
9. Brian Westfall, 2015, "LMS Buyer's view" , Software Advice.
10. Gauri Reyes, 2015, "Uncovering the Full Advantages of Cloud-Based Learning Solutions", MindFlash.