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Enhancing E-Learning using New Technologies: A Review

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ABSTRACT

With the advancementsinInformation Communication Technologies and therequirementfor enhanced learningenvironments withinnovativetechnologies andresources has created aneed to teach students more effectively. The present study discusses recent advancements in technologies for assisting learning and teaching.In this paper the studies related to cloud based E- learning models are discussed in order to help educationalinstitutes to manage their E-learning contentinanefficient andcost- effectiveway.

Keywords: E- Learning, Cloud Computing, LMS, LCMS, GAFE etc.

I.INTRODUCTION

E-learning systemsare complex, datasystems primarily determinedforthesupport of E-learningactivities[1].They haveseveralnameswhichbasicallymeanthesame:Virtual learning environment, learning management system, Course management system, Learning content management system, Learning support system [2].In India under the umbrella of MHRD, government has initiated E- learning through various programs in order to utilize ICT for education to improve quality and quantity of educational services like NPTEL, Virtual Labs, A-View, e- Yantra and FOSSEE and many more. Technologies like Learning Management System, Learning Content Management System and Cloud Computing have added new dimensions to E- learning.

II.E- LEARNING SUPPORTIVE ADVANCEMENTS IN TECHNOLIGIES

Learning Content Management Systems: An LCMS is a system designed to creating and managing teaching content for ICT based learning. It is used to centralize learning content in order for easy search and reusability. The LCMS is excellent tool for creatingtraining content,thatcan be maintained by the teaching design teams.The LCMS platform is thus intended for training and is used for content dissemination via LMS platform.(http://www.wethetalent.co)

Learning Management System: The LMS platform is a training dissemination tool particularused for distance training. This is an online platform in order to provide learning content to learners, records training monitoring data such as score, time spent, etc. The results are recorded and the LMS generates comprehensive results of thestudents' progress through the courses they have attended.

(http://www.wethetalent.co)

The main characteristics of an LMS are capability of integrating multiple media, support different languages and resources and presenting information in an organized manner to provide learning through interaction. Many studies concluded that well-planned course, based on innovative teaching methodologies is essential for effective e-learning. The comparison of LCMS and LMS is depicted in Table 1.(http://www.wethetalent.co)

SNo	Features	LCMS	LMS
1	Users	Training Services Production studios	Training Services Learners
2	Training Content Creation	Yes	No
3	Training Content Dissemination	No	Yes
4	Content Production Process Management Features	Yes	No
5	Content Optimization and reuse assistance	Yes	No
6	Data sharing between trainers and learners	No	Yes
7	Analysis of Training results	No	Yes

Table 1: Features of LCMS and LMS

*Google Applications For Education:*Google Apps for Education (GAFE) is collection of applications offered by Google to schools and educational institutions for free. These communication and collaboration apps include Gmail, Calendar, Drive, Docs and Sites, and a GAFE account unlocks access to dozens of other collaborative tools supported by Google.(http://edtechteacher.org/gafe/)

These applications are completely available online or in the cloud. All Google Apps save to the cloud provide users flexibilityto work from any device with an Internet connection. The suite allows users to create and edit files online while collaborating with other users in real-time.(https://en.wikipedia.org/wiki/Google_Docs,_Sheets,_and_Slides)

Cloud Computing :"Cloudcomputing canbe definedasanew styleof computing inwhich dynamically scalableand often virtualized resources are provided asa services overthe Internet"[3].Thecloud model hasfiveessentialcharacteristics-on demand self-service,broad networkaccess,resourcepooling, rapid elasticity andmeasuredservice.Italsoliststhreeservice modelsas–softwareasservice,platform asservice, infrastructureasserviceandthefourdeploymentmodels - private, public ,community and hybrid [4].

III. LITRATURE REVIEW

Phankokkruad (2012)[5]proposed cloud based e-learning architectureconsistedofthreelayers:(1)infrastructurelayer,(2)platform (middle)layer,and,(3) application layer.Infrastructure layer providesthecomputing andstoragecapacityforthehigherlevel .ThePlatform (middle)layerusedforproviding thelearningresources as aservice. It hastwomodules:itemclassification module(ICM)and courseselectionmodule(CSM).Theyareusedforaccessing theitemsfromtheitem bankand selectingsuitablelearningcontentfromthecontentdatabase.The Applicationlayerwhichisresponsibleforinterfaceprovisionforthestudents.

SelviandroandHasibuan (2013)[6]proposed five layeredarchitecture: infrastructurelayer, platformlayer,applicationlayer, accesslayeranduserlayer. Firstlayercontainsarchitecturesupporting infra- structure likeCloudplatform,virtualmachine,virtualrepositories andphysical infrastructure suchasservers,network devices,storage, buildings andotherphysical facilities.Theplatformlayer consists of operatingsystem and various software for the execution of e-learningapplication.Theapplicationlayerisaspecifice-learningapplication thatisutilizedfor sharinglearningresourcesandinteraction amongusersthatincludessynchronous or synchronous discussionandchatting. Theaccesslayer is responsible for managing accesstocloude-learning serviceswhichisavailableonthearchitecturesuchas:typesofaccessdevicesand presentationmodels. The last layer is theuserslayerconsistsofvariouseducational institutionsthatwillusecloude-learning. The researchers havedevelopedaprototypeofacloud-based e-learning and a pilot study is conductedatthreehighereducationinstitutions. The study suggested to performanevaluationoftheuseofcloud-basede-learning.

Cenka and Hasibuan(2013)[7] presented a study of EnhancingEducationalServices Using Cloud Technology and proposed design ofCloud Educationarchitecture asan alternativesolution to enhanceeducationalservicesdistribution. The studygoes through variousphasesidentifying problemsand need,determinethe servicemodel, designof Cloud Education,implementation,testing,and lastisevaluation. The proposed model consists of five layers:(a)Userlayer that contains theuserofCloudEducation, (b)AccessLayeris responsibleprovidingmulti-channelaccess;(c) ServicesLayer containsapplications, data,andinfrastructure services,(d) OperationalLayerisresponsibleformanagingtheoperationalactivitiessuchas:business,resources,quality,user,security ,andservicesmanagement,(e)Infrastructurelayercontaining a functionalandphysicalinfrastructure.Theresultsofsimulation testsconcluded that theeducational stakeholderhasmanyservicesmodels amongothers:(1) application servicessuch as:e-Learning,e-Library,e-Lab,e-Academic,and e-Course,(2)dataservicessuch as:learning materials,librarycollections,scientific publications,student identity,lecturersprofile,and highereducation profile,(3) infrastructureservicessuch asvirtualstorage. Meanwhile,allof serviceson Cloud Education canbeaccessedusinganydevices such asmobilephones,computers,and tabletcomputers.

Alfi, Amin and Hosary (2016)[8]conducted a study to adopt cloud computing technology to enhance the architecture of a proposed learning content management system.The proposedsystemwas developedtobe multi-platform,cross- browsersystem that can helpeducationalinstitutesandteacherstomanage E-learning contenteffectivelyandcostless.Themethodology adoptedGoogle Applications For Education (GAFE)toenhancetheE-content management process.Itincludesa listofcloud- basedapplicationsfor teachers toquickly accessthe requiredapplicationandcreate, manage,store,andshareE- content through Web browser as well a setof demonstrationvideostohelpthemknow about howtousethese applications. Furtherdepending ona heuristicevaluationchecklist,theproposed systemwasevaluatedbyagroup ofcomputerandinformation technology teachers. The study concluded that the systemachieved92.4%ofusabilityandefficacy,soithas beenhighly

recommended,sinceitshowedahighlevelof availability, accessibility,andcosteffectiveness.These benefits ofcloudcomputing canhelp to buildnew cloud-basedsolutions that givemaximum efficiency andutilizationofresourcesto enhance E-learning system'sarchitecture.

IV. CONCLUSION

This paper reviewed the proposed architecture of cloud based E-learning by various researchers. It concludes that the implementation of such systems in developing countries like India for delivering school education will boost to provide quality education in rural as well as urban areas. In spite of this it also reduce the burden of educationalinstitutionsto provideinfrastructure becauseall required infrastructure of E- learning will beprovidedbythecloudserviceprovider. Educationalinstitutions willonlypayforthe services used like forthecostofdeveloping e- learning systems, maintenance charges etc. Cloud based systems will help educators to create engaging learning experience and delivering outcome based education.

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