ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Vol 5, Issue 4, April 2018

# Implementation of Interactive E – Learning System using Cloud Computing

[1] N. Harika, [2] S. Geetha, [3] S. Nasrin, [4] J.C. Kavitha
[1][2][3] B.E-Computer Science and Engineering
[4] Assistant Professor, Department of Computer Science and Engineering
RMK College of Engineering and Technology

**Abstract: Currently the variety of possibilities of browsing the Web either via PCs, tablets or mobile phones has allowed learners to have access to a large repository of learning resources. However, given that most E-learning platforms, mainly used by universities and academic institutions around the world, do not actively follow the technological development as they usually require a lot of hardware and software resources, having recourse to Cloud computing technologies will certainly change the way applications are designed and accessed, and will, at the same time, contribute in cutting down costs. In this respect, the use of Web 2.0 technologies, which have completely revolutionized the way in which individuals communicate, are capable of enhancing the ways both learning and teaching are conducted. Our objective in this paper is, two-fold: examine the current state and the challenges of using Cloud technologies in E-learning environments propose a Cloud-based service that would monitor and foster students' learning and provide educators with recommendations to improve platforms and resources.**

**Keywords-Cloud computing, Cloud community, E-learning, sentiment analysis architecture.**

## I. INTRODUCTION

Cloud computing is an information technology (IT) paradigm that enables ubiquitous access to shared pools of configurable system resources and higher-level services that can be rapidly provisioned with minimal management effort, often over the Internet. Cloud computing relies on sharing of resources to achieve coherence and economies of scale, similar to a public utility. Third-party clouds enable organizations to focus on their core businesses instead of expending resources on computer infrastructure and maintenance. cloud computing allows companies to avoid or minimize up-front IT infrastructure costs. cloud computing allows enterprises to get their applications up and running faster, with improved manageability and less maintenance, and that it enables IT teams to more rapidly adjust resources to meet fluctuating and unpredictable demand. Cloud providers typically use a "pay-as-you-go" model, which can lead to unexpected operating expenses if administrators are not familiarized with cloud-pricing models. The Internet is a place to read web pages that allow users to environmental education and implementation of software applications that is changing. As with rapid growth of the cloud computing architecture usage, more and more industries move their focus from investing into processing power to renting processing power from a specialized vendor but education field is no different. E-learning systems usually require many hardware and software resources. Cloud computing technologies have changed the way applications are developed and accessed. They are aimed at running applications as services over the Internet on a scalable infrastructure. Now, Cloud computing that introduces efficient scale mechanism can let construction of E-learning system be entrusted to suppliers and provide a new mode for E-learning. Therefore, an 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.

E-learning is also trending above regular classroom teaching for the sake of convenience, comfort and savings it offers in terms of space, pace, money and time. Instead of attending regular classroom lectures, e-learning websites allow students to learn from the comfort of their own home, library, or anywhere else with a PC/Mobile/Tablet/Laptop and a working internet connection. The study content of various grades can be easily accessed by the student in the format of ebooks, online study guides and stepwise solution manuals, e-mail exchange with online tutors, live chat with online tutors, downloadable videos, pre-recorded lectures, audio study guides and pre-loaded content on controlled Tablet devices. E-learning has rapidly evolved from a thing of the futureto a practical approach towards education. It will continue to be an extremely useful classroom

ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Vol 5, Issue 4, April 2018

teaching tool as well as self-study platform. With the rise of virtual reality technology and augment reality solutions, experimental subjects, skill-based learning and military training will come to depend more heavily on e-learning solutions. Various education technology providers are also hinting towards the rise of mobile learning solutions (also known as mlearning) as the advanced stage of education technology in future. I phone and face time based online tutoring has also become popular and is being termed as I learning platform.

## II.EXISTING SYSTEM

The world wide web(WWW or web in short) E-Learning provides a simple 'point' and 'click' means of exploring the immense volume of pages of information residing on the internet. Information on web is presented on web pages, which appear as a collection of text, graphics, and pictures. In addition, a web page can contain hyperlinks to other web pages. Much of the web's success is due to the simplicity with which it allows users to provide, use and refer to information distributed geographically around the world. The problem definition for the existing system is, E-learning system lack the appropriate infrastructure and integrated application model. Browsing the Web has allowed learners to have access to a large repository of learning resources. E-Learning platform do not actively follow the technological development. Requires a lot of hardware and software resources.

## III.PROPOSED SYSTEM

A cloud technology gives platform to run our e-learning application on services basis to any end users using internet over the cloud infrastructure.It will provide a optimum affordable price package to educational organization in particular for trainer and learner. The requirements specification is a technical specification of requirements for the software products. It is the first step in the requirements analysis process it lists the requirements of a particular software system including functional, performance and security requirements. The requirements also provide usage scenarios from a user, an operational and an administrative perspective. The purpose of software requirements specification is to provide a detailed overview of the software project, its parameters and goals. This describes the project target audience and its user interface, hardware and software requirements. It defines how the client, team and audience see the project and its functionality. With most programming languages, you either compile or interpret a program so that you can run it on your computer.Compilation happens just once; interpretation occurs each time the program is executed. The user logs in with their username and password. The user may be trainer or learner. The authentication module checks the given details of the user stored in the database. Only authorized users will be directed to home page. Trainer uploads the materials for the learners based on the department. Different department trainers will upload materials in cloud. If they want to upload in private cloud they will upload it privately. If they want to upload in public cloud they will upload it publicly. The materials which is uploaded by the trainers will be visible in the learner side. The user logs in and studies the materials uploaded by the trainer. The admin is responsible for monitoring these process. The materials which is uploaded by the trainers will be visible in the learner side. The user logs in and studies the materials uploaded by the trainer. The admin is responsible for monitoring these process.

## IV .IMPLEMENTATION

Coding standards are guidelines to programming that focuses on the physical structure and appearance of the program. They make the code easier to read, understand and maintain. This phase of the system actually implements the blueprint developed during the design phase. The coding specification should be in such a way that any programmer must be able to understand the code and can bring about changes whenever felt necessary. Some of the standard needed to achieve the above-mentioned objectives are as follows:
Program should be simple, clear and easy to understand.

### NAMING CONVENTIONS

Naming conventions of classes, data member, member functions, procedures etc., should be self-descriptive. One should even get the meaning and scope of the variable by its name. The conventions are adopted for easy understanding of the intended message by the user. So it is customary to follow the conventions. These conventions are as follows:

**Class names :**

Class names are problem domain equivalence and begin with capital letter and have mixed cases.

Member Function and Data Member name :

Member function and data member name begins with a lowercase letter with each subsequent letters of the new words in uppercase and the rest of letters in lowercase.

ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Vol 5, Issue 4, April 2018

**VALUE CONVENTIONS**

Value conventions ensure values for variable at any point of time. This involves the following: Proper default values for the variables. Proper validation of values in the field.

Proper documentation of flag values.

**SCRIPT WRITING AND COMMENTING STANDARD**

Script writing is an art in which indentation is utmost important. Conditional and looping statements are to be properly aligned to facilitate easy understanding. Comments are included to minimize the number of surprises that could occur when going through the code.

**MESSAGE BOX FORMAT**

When something has to be prompted to the user, he must be able to understand it properly. To achieve this, a specific format has been adopted in displaying messages to the user. They are as follows:

X – User has performed illegal operation.

! – Information to the user.

## V. TESTING PROCEDURES

**SYSTEM TESTIN**

Testing is performed to identify errors. It is used for quality assurance. Testing is an integral part of the entire development and maintenance process. The goal of the testing during phase is to verify that the specification has been accurately and completely incorporated into the design, as well as to ensure the correctness of the design itself. For example the design must not have any logic faults in the design is detected before coding commences, otherwise the cost of fixing the faults will be considerably higher as reflected. Detection of design faults can be achieved by means of inspection as well as walkthrough Testing is one of the important steps in the software development phase. Testing checks for the errors, as a whole of the project testing involves the following test cases:

Static analysis is used to investigate the structural properties of the Source code. Dynamic testing is used to investigate the behavior of the source code by executing the program on the test data.

**TEST DATA AND OUTPUT**

**UNIT TESTING**

Unit testing is conducted to verify the functional performance of each modular component of the software. Unit testing focuses on the smallest unit of the software design (i.e.), the module. The white-box testing techniques were heavily employed for unit testing.

**FUNCTIONAL TEST**

Functional test cases involved exercising the code with nominal input values for which the expected results are known, as well as boundary values and special values, such as logically related inputs, files of identical elements, and empty files.

**PERFORMANCE TEST**

It determines the amount of execution time spent in various parts of the unit, program throughput, and response time and device utilization by the program unit.

**STRESS TEST**

Stress Test is those test designed to intentionally break the unit. A Great deal can be learned about the strength and limitations of a program by examining the manner in which a programmer in which a program unit breaks.

**INTEGRATION TESTING**

Integration testing is a systematic technique for construction the program structure while at the same time conducting tests to uncover errors associated with interfacing. i.e., integration testing is the complete testing of the set of modules which makes up the product. The objective is to take untested modules and build a program structure tester should identify critical modules. Critical modules should be tested as early as possible. One approach is to wait until all the units have passed testing, and then combine them and then tested. This approach is evolved from unstructured testing of small programs. Another strategy is to construct the product in increments of tested units. A small set of modules are integrated together and tested, to which another module is added and tested in combination. And so on. The advantages of this approach are that, interface dispenses can be easily found and corrected. The major error that was faced during the project is linking error. When all the modules are combined the link is not set properly with all support files. Then we checked out for interconnection and the links. Errors are localized to the new module and its intercommunications. The product development can be staged, and modules integrated in as they complete unit testing. Testing is completed when the last module is integrated and tested.

ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Vol 5, Issue 4, April 2018

## TESTING TECHNIQUES / TESTING STRATERGIES

### a)TESTING

Testing is a process of executing a program with the intent of finding an error. A good test case is one that has a high probability of finding an as-yet –undiscovered error. A successful test is one that uncovers an as-yet-undiscovered error. System testing is the stage of implementation, which is aimed at ensuring that the system works accurately and efficiently as expected before live operation commences. It verifies that the whole set of programs hang together. System testing requires a test consists of several key activities and steps for run program, string, system and is important in adopting a successful new system. This is the last chance to detect and correct errors before the system is installed for user acceptance testing. Testing is the process of executing the program with the intent of finding the error. A good test case design is one that as a probability of finding an yet undiscovered error. A successful test is one that uncovers an yet undiscovered error. Any engineering product can be tested in one of the two ways:

### b) WHITE BOX TESTING

This testing is also called as Glass box testing. In this testing, by knowing the specific functions that a product has been design to perform test can be conducted that demonstrate each function is fully operational at the same time searching for errors in each function. Basis path testing is a white box testing.

### c) BLACK BOX TESTING

In this testing by knowing the internal operation of a product, test can be conducted to ensure that "all gears mesh", that is the internal operation performs according to specification and all internal components have been adequately exercised. It fundamentally focuses on the functional requirements of the software. The steps involved in black box test case design are:
Graph based testing methods
Equivalence partitioning

### d) SOFTWARE TESTING STRATEGIES:

A software testing strategy provides a road map for the software developer. Testing is a set activity that can be planned in advance and conducted systematically. For this reason a template for software testing a set of steps into which we can place specific test case design methods should be strategy should have the following characteristics: Testing begins at the module level and works "outward" toward the integration of the entire computer based system.Different testing techniques are appropriate at different points in time. Testing and Debugging are different activities but debugging must be accommodated in any testing strategy.

### e) INTEGRATION TESTING:

Integration testing is a systematic technique for constructing the program structure while at the same time conducting tests to uncover errors associated with. Individual modules, which are highly prone to interface errors, should not be assumed to work instantly when we put them together. The problem of course, is "putting them together"- interfacing. There may be the chances of data lost across on another's sub functions, when combined may not produce the desired major function; individually acceptable impression may be magnified to unacceptable levels; global data structures can present problems.

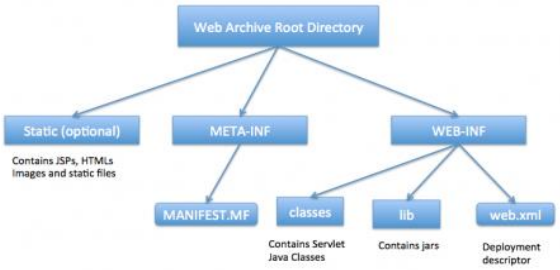


*Fig.4 Web Application Directory*

## VI. OVERVIEW

The complete overview of the system is depicted through the following flowchart.

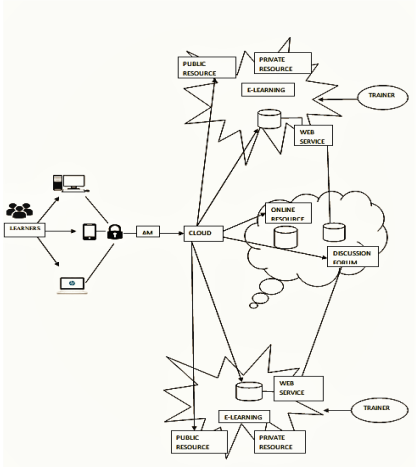


*Fig. 5 Flowchart depicting the overall system*

ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Vol 5, Issue 4, April 2018

## VII. RESULTS

A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the users and to other system through outputs. In output design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source information to the user. Efficient and intelligent output design improves the system's relationship to help user decision-making. Designing computer output should proceed in an organized, well thought out manner; the right output must be developed while ensuring that each output element is designed so that people will find the system can use easily and effectively. When analysis design computer output, they should Identify the specific output that is needed to meet the requirements. Select methods for presenting information. Create document, report, or other formats that contain information produced by the system. The output form of an information system should accomplish one or more of the following objectives. Convey information about past activities, current status or projections of the Future. Signal important events, opportunities, problems, or warnings are Trigger an action and Confirm an action.

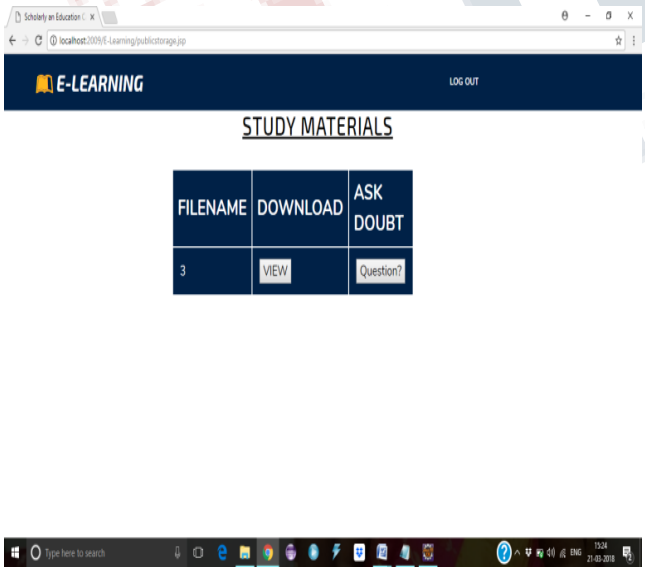


*Fig. 6 Viewing Material in E-Learning Portal*

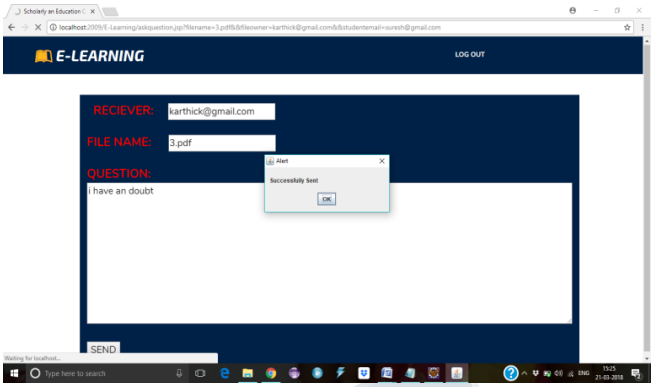


*Fig. 7 Asking Questions in E-Learning Portal*

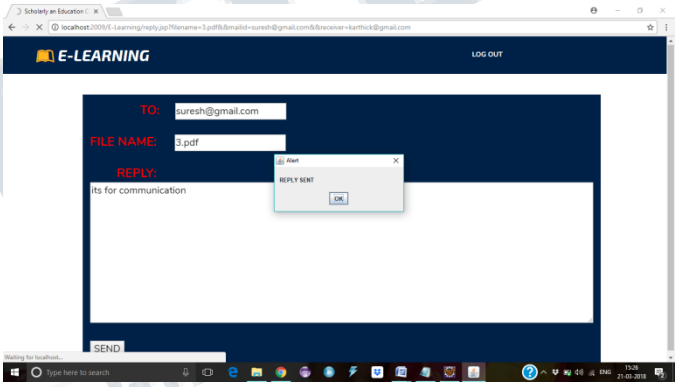


*Fig. 7 Reply from the trainer in E-Learning Portal*

## VIII CONCLUSION

Cloud computing technologies have changed the way applications are developed and accessed. They are aimed at running applications as services over the Internet on a scalable infrastructure. Now, Cloud computing that introduces efficient scale mechanism can let construction of E-learning system be entrusted to suppliers and provide a new mode for E-learning. Therefore, an 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. Our future work is to implement e-learning using cloud computing as an virtual reality model which provides more interactive atmosphere between the trainers and learners.

ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Vol 5, Issue 4, April 2018

## REFERENCES

[1] Mitra, Sugata, and Vivek Rana. "Children and the Internet: Experiments with minimally invasive education in India." British Journal of Educational Technology 32.2 (200 I): 221-232.

[2] Keller, Christina, and Lars Cernerud. "Students' perceptions of e-Ieaming in university education." Journal o( Educational Media 27.12 (2002): 55-67.

[3] Biggs, John B. Teaching for quality learning at university: What the student does. McGraw-Hill Education (UK), 2011.

[4] Schank, Rocher C. "Designing world-class e-Ieaming: How IBM, GE, Harvard Business School, and Columbia University are succeeding at elearning." (2002).

[5] Khan, Badrul H. "A framewark for web-based learning." Web-based training (2001): 75-98.

[6] Mell, Peter, and Tim Grance. "The NIST definition of cloud computing." (2011): 20-23.

[7] Dong, Bo, et al. "BlueSky cloud framework: an e-Ieaming framewark embracing cloud computing." Cloud Computing. Springer Berlin Heidelberg, 2009. 577-582.

[8] Doelitzscher, Frank, et al. "Private cloud for collabaration and eLeaming services: from IaaS to SaaS." Computing 91.1 (2011): 23-42.

[9] Vishwakarma, Alok Kumar, and A. E. Narayanan. "E-learning as a service: A new era far academic cloud approach." Recent Advances in Information Technology (RAIT), 2012 1st International Con(erence on. IEEE,2012.

[10] Dong, Bo, et al. "An e-Ieaming ecosystem based on cloud computing infrastructure." Advanced Learning Technologies, 2009. ICALT 2009. Ninth IEEE International Conference on. IEEE, 2009.

[11] Cucinotta, Tommaso, et al. "Virtualised e-Learning on the IRMOS realtime Cloud." Service Oriented Computing and Applications 6.2 (2012): 151-166.

[12] Phankokkruad, Manop. "Implement of cloud computing for e-learning system." Computer & Information Science (ICCIS), 2012 International Conference on. Vol. 1. IEEE, 2012.

[13] Yan, Shixing, et al. "lnfrastructure management of hybrid cloud far enterprise users." Systems and Virtualization Management (SVM), 2011 5th International DMTF Academic Alliance Workshop on. IEEE, 2011.

[14] Ghazizadeh, Aida. "Cloud computing benefits and architecture in eleaming." Wireless, Mobile and Ubiquitous Technology in Education (WMUTE), 2012 IEEE Seventh International Conference on. IEEE, 2012.

[15] Liang, Po-Huei, and Jiann-Min Yang. "Virtual personalized leaming environment (VPLE) on the cloud." Web Information Systems and Mining. Springer Berlin Heidelberg, 2011. 403-411

[16] Grewal, Angad, et al. "The e-Ieaming lifecycle and its services: the Web services approach." (2005): 4-1.

[17] Pankratius, Victor, Olivier SandeI, and Wolt'fried Stucky. "Retrieving content with agents in web service e-learning systems." The Symposium on Professional Practice in Al, IFIP WGl2. Vol. 6. 2004.

[18] Xu, Zhengfang, Zheng Yin, and Abdulmotaleb EI Saddik. "A Web services ariented framewark far dynamic e-learning systems." Electrical and Computer Engineering, 2003. IEEE CCECE 2003. Canadian Conference on. Vol. 2. IEEE, 2003.

[19] Pang, Bo, and Lillian Lee. "Opinion mining and sentiment analysis." Foundations and trends in information retrievaI2.1-2 (2008): 1-135.

[20] Ayral, Hakan, and Slrma Yavuz. "An automated domain specific stop ward generation method for natural language text classification." Innovations in Intelligent Systems and Applications (INISTA), 2011 International Symposium on. IEEE, 2011.