

Cloud Computing based Integrated Virtual Learning Framework for Academic Institutions

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Abstract— Cloud computing is one of the most emerging technologies for the modern business organizations. Dynamic scalability and resource virtualization capabilities of cloud computing also attracted the academic fertility to adopt it for renovation of the existing academic systems. Indian B-Schools have always shown their curiosity to adopt new technology in their curriculum as well for the modernization and improvement of their academic process. We have proposed a new cloud computing based architecture for E-Learning systems (J-CCELS) in B-Schools. This framework is based on public cloud architecture and exploits the open source platform for its prototype development and deployment .Prototype reveals goods results in digital content management, knowledge sharing, knowledge base integration and virtualization of resources. It may be a suitable solution for all the B-Schools for integrating their resources and knowledge sharing.

Keywords— Cloud Computing, Open Source Platforms, E-Learning, Knowledge Management, Virtualization

1. Introduction

Cloud computing has become a buzz word now a days. Cloud computing has expanded its horizon in different sectors and areas. Cloud computing is a conceptual computing model and it is based on n the Internet services .Cloud computing ensures that users can simply use the computing resources on rental basis i.e. demand and pay money according to their usage by a metering pattern. In cloud computing, all the computing resources are treated as service.

E-learning is a network or especially Internet-based learning process. It uses internet technology to design, implement, select, manage, support and extend learning. E-learning replaces traditional education methods and improves the efficiency of education systems and flows [1].

E-learning is widely used today on different educational stages: continuous education, company trainings, academic courses, etc. There are various e-learning solutions from open source to commercial. There are three types of users involved in an e-learning system: Administrator, user (Client/Learner/Student) and the trainers. Generally E-learning systems are developed on distributed platforms. The framework of a distributed e-learning system includes software components (the client application, an application

server and a database server) and the necessary hardware components (client/node, server and telecommunication infrastructure) [2, 3].

The aim of this paper is to present a robust cloud computing based e-learning application for developing a virtual and interactive personal learning environment which includes a wide range of technology, and tools for education like open source platform (Moodle/Joomla), open source applications (PHP) and open source database (MySQL). The proposed framework is intended to support structured and semi-structured learning and integrate multiple clouds along with the local and global knowledge base that enable various interactive learning services , knowledge sharing and applications.

2. Proposed Framework

Runaway We have proposed a cloud computing based architecture for E-Learning system which can be a suitable solution for the B-Schools .We have given the name “J-CCELS” to our system.

This framework contains following logical components:

- **Client:** These are the users which interact with the system .It includes Super user (overall control and management) , Administrator(privileges of managing some specific modules),K-Trainer(we call it knowledge trainer) and the end users(Learners).
- **Local Cloud:** In includes the combination of local group resources .In our case we have created a local cloud of our Jaipuria Group (resources from different campuses of Jaipuria Institutions).
- **B-School Cloud:** In includes the resources of different leading B-Schools which is based on the public cloud framework.
- **Data Center:** It is our local centralized data center .We calls it Jaipuria Data Center. It is connected with local cloud and global cloud and also integrated with B-School Knowledge base.
- **B-School Knowledge Base:** It includes the knowledge resources of different B-Schools which work on public sharing platform with access privileges.

This E-Learning system is developed on open source platform in which knowledge resources are shared with accuracy, participant’s communication is extremely smooth, and cross-platform operations can be executed. The public cloud framework is preferred for global knowledge management.

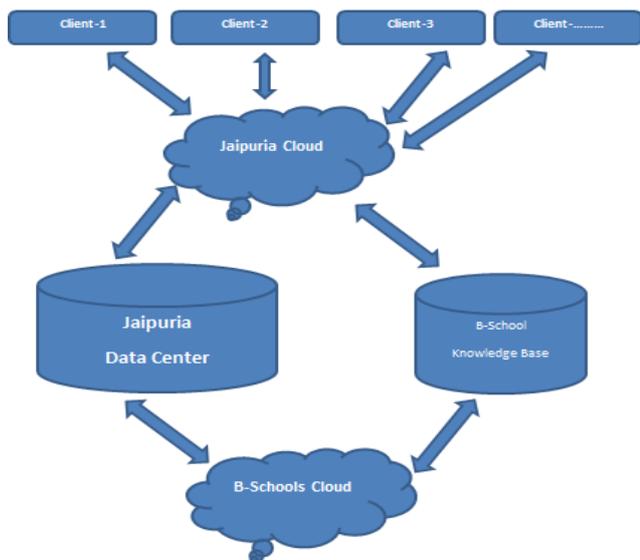


Fig.1: Proposed framework of J-CCELS

Our E-Learning System is based on multi-layered architecture which includes three layers: Infrastructure layer, Platform integration Layer and Application layer.

L-1(Infrastructure): It contains the resources and logical architecture of the information infrastructure .It provides the facility of cross platform content sharing.

L2 (Platform Integration): It provides the cross platform integration for variety of resources of different knowledge base locations and different platforms.

L3 (Application): It is a robust frontend through which the users interact with the system. The interactive resource includes trainer and learners. Our system is based on the full sharing method of the resources. Clients need a web browser to use the interactive experience, mobility and storage services. It contains the interactive materials (audio, video, chat, and forum), courses and sharing teaching resources [6, 7, 8, 10].

3. Prototype Development of J-CCELS

We have developed a prototype of the proposed E-Learning system with highly interactive GUI features .It is developed on open source platform (PHP as a front end & MySQL as backend) Welcome screen provide the panel for different categories of users of the system. Id & Password based first level access control is applied.

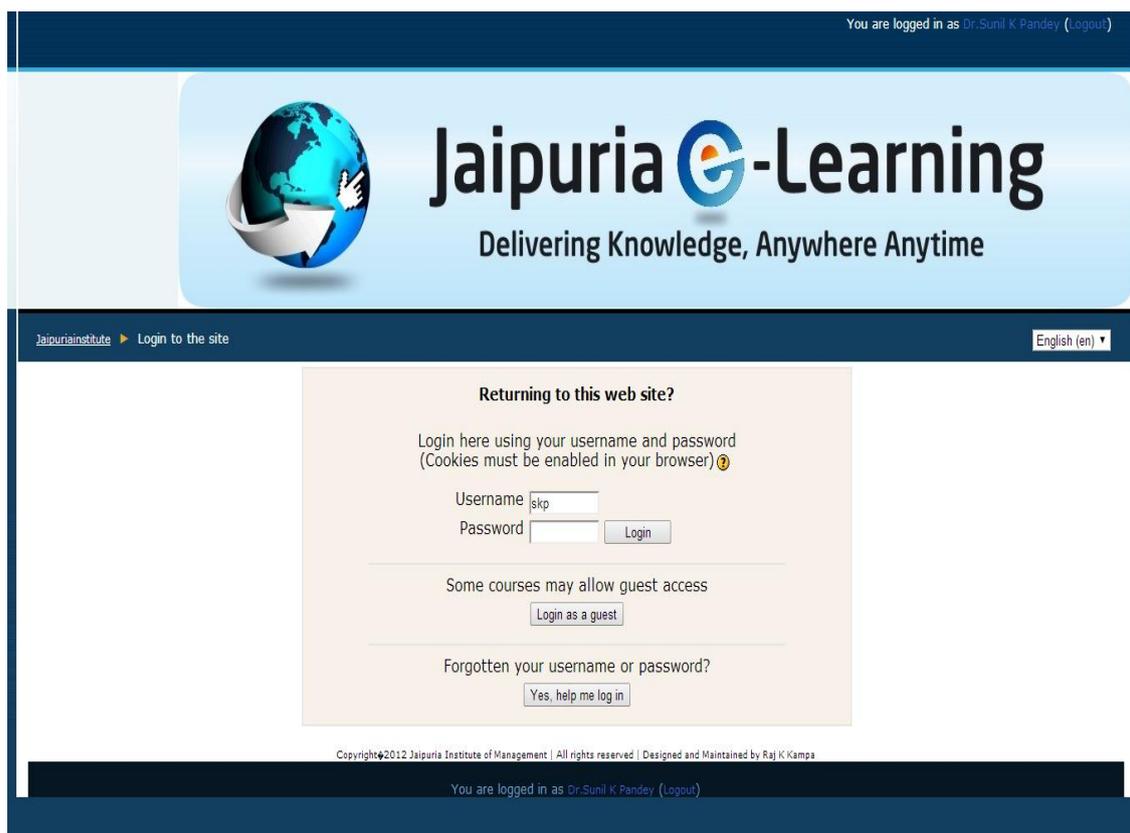


Fig.2: Welcome screen of J-CCELS

After login to the system, the main screen appears which includes all the resource management modules.



Fig.3: Course Panel

We have to just turn off the editing option to enable the creation of resources and activities.

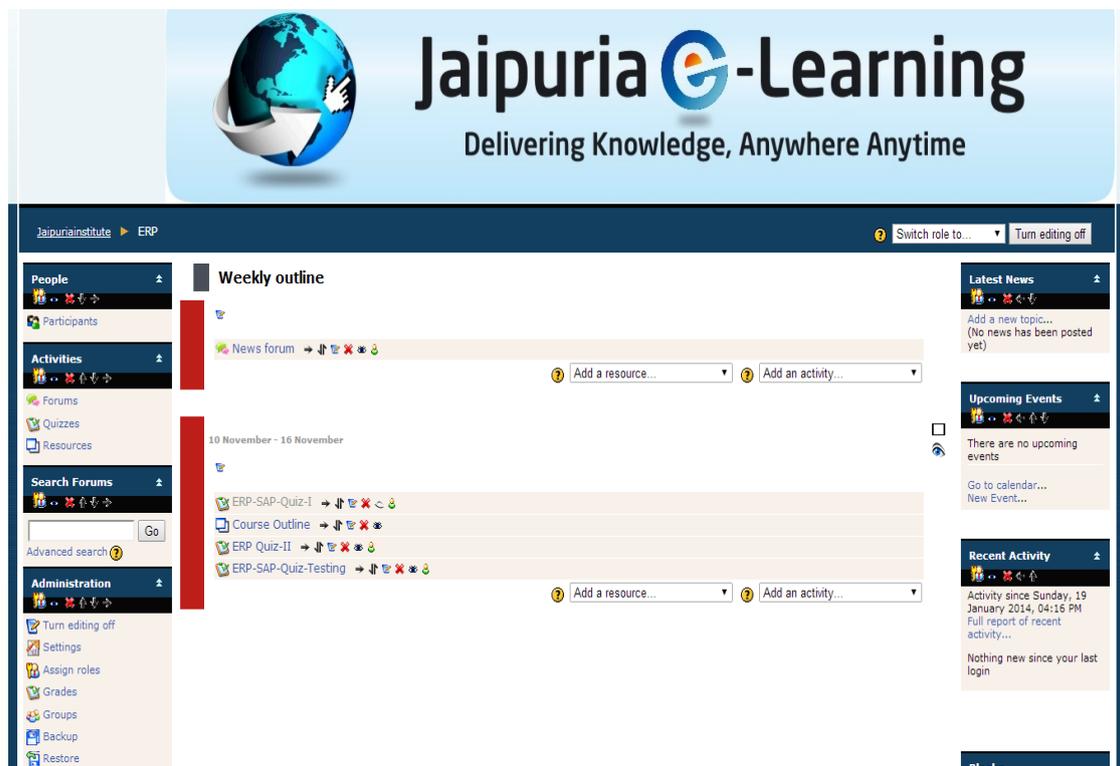


Fig.4: Resource Management Panel

The following screen displays how to create the chat panel for the users.



Fig.5: New Resource Management

The following screen displays how to create the IT forum for the users.



Fig.6: Creating Forums for group

The simple in interactive GUI of the system ease the process of e-learning activities.

4. Conclusion

Our e-learning system is an open source of learning. This system is working fine for the requirement of B-Schools and it may be used for other Institutions for different online web based academic purpose. The system has some limitation of cross platform integration which can be achieved with new technologies and we can produce a robust and efficient e-learning system.

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