

Combine Cloud Services Based on Web for Educational ERP and E-Learning

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Abstract—Today ERP is very costly so it is tough to create due to limited budgets of educational institutions. So we have designed a standard system which can give more facilities to the educational systems with limited budget. Also it will be web based and it will have Pay As You Go model which can be achieved using the cloud based Educational ERP. In the market, available E-learning tools are also expensive and are not personalized, so there is a need to much easy and standardize tool, which will satisfy the needs of the organization with minimum cost, high outputs and Zero preservation cost. Our E-Learning tool gives distribution of contents and knowledge with the students, which is particular to the users. This tool is having Pay As You Go (PAYG) model because of which the today consumption of the organization will decrease.

1. INTRODUCTION

In today's era of computing where information is a key constraint in the students and teachers community, updated information plays a vital role in the development of the teaching and learning methodologies [1]. Most of the printed books are outdated as soon as they are released. As information is evolving every second in this digital era, it's important to keep yourself updated. All the teachers should get the updated contents so that they can deliver the latest information to their students. Today most of the books are digitized because of which it's possible to keep the contents updated. Hence it is possible to impart updated knowledge to the teachers and students. Moving ahead with digitization of books, today we have more advanced stages of books called the interactive books where the students and the teacher can interact with the books. The books are no more static entities. They are now having dynamic objects, videos and movies integrated in them. Moving ahead books are now more advanced. Today we have audio books where the information written in the book is converted to audio format and there is no need to read the book. In fact the students and teachers can now listen to the books. Today we are also facing the problem of global warming. We, the engineers, can concentrate at this and reduce the carbon emission done by the heavy server machines running in the server rooms. Also the cost of cooling these servers can be neglected. Hence the web based cloud service for E-learning environment can be a boon for the

society as green computing infrastructure can be used for E-learning purpose.

To manage all these contents we need integrated software which can manage contents and information together with a single user interface. The educational ERP software available in the market today does not provide these facilities. In fact they are more costly and need more infrastructure and maintenance throughout the academic year [2]. To bridge this gap between the need to the day and the cost we have designed an integrated solution, which will serve the need of the users.

2. CLOUD SERVICES FOR E-LEARNING

Some of the functionalities, which will be provided as a service in the E-learning for both teachers and the students, are as follows.

- 1) Service of authentication for user.
- 2) Management of User for
Teacher
 - a) Creation of student account
 - b) Generation of results
 - c) Creation of assignments and Quiz.
 - d) Insertion of attendance
 - e) Uploading of studying and teaching materials

(Audios, Videos, Documents,, Presentations, Books ,Etc.)

- 3) Students view
 - a) Materials related to learning
 - b) Scores
 - c) Achievements
 - d) Record of attendance

The Fig. 1 Below shows the Service that is based on web that will be given to the system's user. The validation web service will give user validation for authorized users and also will limit the unauthorized users because no access will be given to the users that are unauthorized. Only authorized users will be able to use the other web services that are supported on the user's level. The Teachers' View and the Students' view are

the two levels of users. For documents, notes, student account creation the teacher will have access and the student module will help the student to get all the study materials. He will also be able to check his performance online. The information will be synchronized and updated because the entire system is cloud based.

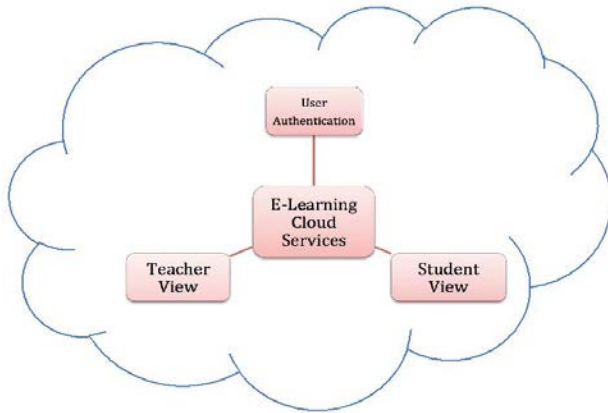


Fig. 1: Services that are based on Cloud for E-Learning

3. CLOUD SERVICES FOR ERP

Cloud ERP is a system that is organized around the platform of cloud and is available on demand [5]. It offers all the modules and services that are offered by any standard ERP application. The Educational ERP will have the following web services, which will help the organization to reduce the cost of infrastructure required to deploy the ERP [3]. Some of the Modules are listed below:

- 1) Finance Account
 - a. Teachers Salary
 - b. Students Fees
 - c. Scholarship
- 2) Academic
 - a. Student Admission
 - b. Teacher recruitment
- 3) Alumni
- 4) Cloud Ready Library
- 5) DSR (Dead Stock Register)
- 6) Planning
- 7) Operation
- 8) HR

These individual cloud based modules will be provided as web services to the end users clients. The clients will have Zero maintenance cost and will require zero efforts to deploy the modules. All the modules will be preconfigured on the cloud servers. The end user will only get the API's or the URL's of the specific modules requested by the organizations. Hence the entire cost will be negligible of the modules as we are having Pay As You Go (PAYG) model for the model of Education ERP which is based on cloud.

The Fig. 2 Below depicts the cloud based services for the ERP environment. Various phases are based on the levels of user authentication all the module are designed as web services and all the web services collaborate with each other. The entire system is deployed on the cloud. Hence the synchronization is possible within various module of the ERP software.

A. Financial Account

The system maintains all the financial data over the cloud. The financial team is connected to the cloud web services designed. The financial team can prepare the salary of the employees depending upon the number of days the employee has worked for the organization. As financial data is crucial it's important to maintain replica of the data. Hence we have used Hybrid Cloud environment where the information about the employee's salary is replicated from the global server to the local server which will be located in-house.

B. Academic

The Academic System will contain various functionalities such as student's admission, registration and Faculty recruitment. All these functionalities are integrated and communicate with each other as and when required. Various departments and other modules of ERP require this information about students and faculties. Hence this information is synchronized across various servers in-house and globally.

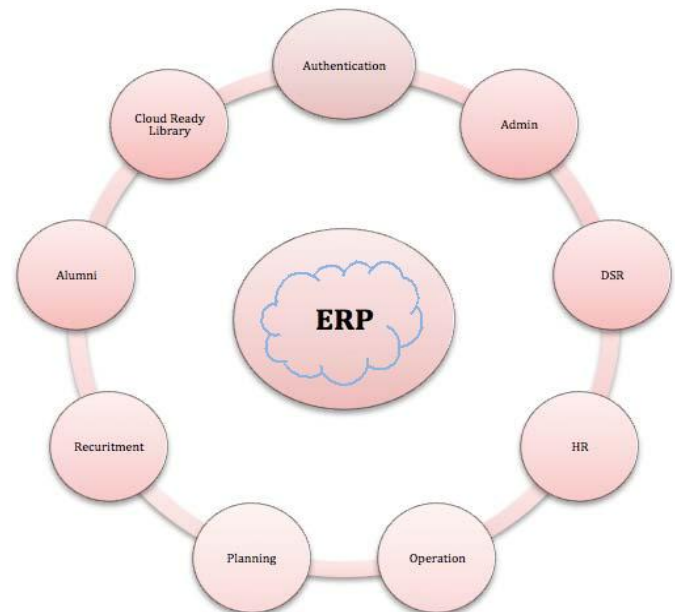


Fig. 2: ERP Cloud Based Architecture

4. ADVANTAGES OF USING CLOUD SERVICES FOR E-LEARNING

Students today are becoming more used to E-learning environments. Also the use of cloud computing is increasing day by day.

The cloud services give so many advantages over the stand-alone application used today for E-learning [4]. Some of the major advantages are listed below

A. Convenience

E-learning system which is based on cloud will be convenient over different platforms because the system is not dependent on platform and also can work on different devices. So it's also independent from hardware.

B. Availability

Today availability is a major issue. This system's bandwidth will be unlimited. Both uplink and downlink and will be available 24x7 and 356 days because there is no restriction on unloading and downloading data or file.

C. Scalability and flexibility

As the cloud based E-learning system is modular it's highly scalable. Each module is a web service and whole web services can be updated without keeping down the entire system. And the system is also highly adaptable because it can work under different operating conditions. The user interface will adjust itself accordingly.

D. Modularity

The E-learning system will have various modules, which can communicate and mutually exchange information with the modules as and when required by the modules to perform various operations. Each module is independent service.

5. ADVANTAGES OF USING CLOUD SERVICES FOR EDUCATIONAL ERP AND E-LEARNING

The advantages of using cloud services for educational ERP and E-learning are as following:

1. Interactive and Better teaching learning process
2. Replacing aging legacy system
3. Help Improve service to customers
4. Prepare students for the future of work
5. Decrease costs and ease of IT management
6. Modernize campus IT environment
7. User Authentication Services
8. Accountability/Regulatory compliance
9. Increase efficiency
10. Keep institution competitive

Effective teaching and learning can help to increase student outputs. Conveying fascinating courses make it easier for teachers to create fascinating multimedia presentations and course materials with Windows, Microsoft Office, Microsoft SharePoint, and Skydrive. Teachers can get the recording of their classes, edit them as professional podcasts and videos, and then again upload them for students to access online. With

Office Web Apps 2010—online companions to Word, Excel, PowerPoint, and OneNote—you can review, edit, share, and work together on documents from any supported web browser, across devices. And Office Mobile 2010 makes it easy to view and edit documents from supported smart phones.

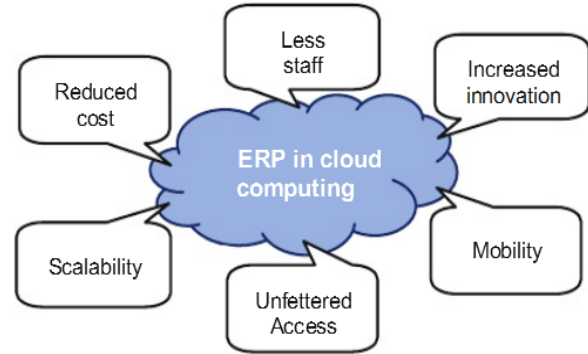


Fig. 3: Benefits of ERP in Cloud Computing

6. WORKING EXPLANATION OF VARIOUS CLOUD SERVICES FOR E-LEARNING AND ERP

Service Oriented Architecture (SOA) concept is used to design the software. So all the web services are separately designed and can transmit between each other. Knowledge will be obtained and presented using techniques of data mining. Fig. below shows some screen shots of the working environment of software application developed.

Fig. 4: Authentication Module for E-Learning and ERP

Fig. 5: Cloud based Teachers Module for E-Learning

Fig. 6: Cloud based Finance Module for ERP

7. CONCLUSION

Cloud services for E-learning will provide a service based tool which will enhance the higher education. It will provide collaboration model, which will help in integration of the various features. All the module of E-learning will be Web Services. Hence it's easy to integrate and plug-in modules as when required by the end users. The overhead of maintenance will be reduced as software will be available 24x7 without any maintenance cost. The ERP module will provide integration of various modules like DSR, Students' and Teacher's module and the management overview. All the modules will be independent and will communicate with each other when required. Information will be collaborative and data mining techniques will be used to pull information from the various sources to display the required information. The phases of the ERP will be individual modules, which are independent web services, and hence the overhead of procuring all the modules of ERP will be reduced. Also the maintenance and deployment cost of the ERP will be negligible.

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