Security Advantages of Cloud ERP and its Databases in Higher Education

Amudha T, Saravanan K

Abstract: An EduCon is a Lead Management cum Customer Relationship Management Software for Educational Consultants. It is cloud-based software hosted on Linux environment. Developed on Php with database on MySQL and Mongo DB, it is heavy-duty software which can handle 500 instances at once with 1 lakh+ active records. EduCon has a strong communication system with bulk SMS and bulk Email server integration with Text Guru and Mail Chimp respectively. This communication system is used to contact leads and send notification and transactional messages. This communication system is also used to take after service feedback from leads.

Key Words: AWS, Booster, Cloud ERP, FileZilla, JetBrains, NoSQL, PHPStorm, SQLyog Ultimate, and Web Browser

I. INTRODUCTION

As the entire world is moving towards digitalization and the need for extraction of information from existing data to make more meaningful decisions is increasing, the requirement and expectations for information-based software is also on the high. Today, each and every organization whether small or medium or big requires a software to handle the data and provide information based on that. This information is used to make an effective decision which takes the organization towards success. The traditional method of storing data on paper-based system is obsolete and everyone wants to store the data digitally for numerous benefits. The increases the data security, timely reaches and permission levels on the information. These systems help in creating a centralized database for the organization which solves problems like data redundancy. This centralized database also enables the organization to get real time updates from all the departments of the organization.

The organizations nowadays not only want to store the data digitally but also want to store the data on the cloud. The new Technologies work better on clouds and the data in more secure and safe. There is very less chance of data lost and the Cloud services provide control panel which enables us to take back up and snapshot at regular basis. This increases the data safety on the cloud.

The data present on the cloud gives a very big advantage of accessibility. The cloud is accessible 24 hours 7 days a week from anywhere in the world from any type of device. This enables the data reach easy and effective. The organizations choose cloud over traditional local server because it also enables the employees to work from any part of the world via internet. Schools and colleges choose cloud as it enables the parents and students to be able to access the data from anywhere at any time. This helps in better communication between the school and parents.

1.1.1 Cloud Enterprise Resource Planning (ERP)

Cloud Enterprise Resource Planning or Cloud ERP is a software suite consisting of various modules to manage the resources of the enterprise or organization. These resources can be material, clients, human resources, etc.

Typical Enterprise Resources Planning software mainly manages the data of the complete organization and consists different portals or modules like Accounts, HR, Production, Sales, Billing, Reception, Marketing etc., to make the resources effective. This effectiveness is achieved by centralizing the data of the organization or enterprise at one place and using data of one portal in another to connect the different segments of the enterprise on real time.

Cloud Enterprise Resource Planning or ERP can also be termed as a process used by companies to manage and integrate the important parts of the businesses. Many Cloud ERP software applications exist to help companies implement resource planning by integrating all of the processes it needs to run a company with a single system. A cloud ERP software system can integrate planning, purchasing inventory, sales, marketing, finance, human resources, and more.

Figure 1.1: Modules in ERP System

An ERP system doesn't always eliminate inefficiencies within the business. The company needs to rethink the way it's organized, or else it will end up with incompatible technology.

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ERP systems usually fail to achieve the objectives that influenced their installation because of a company's reluctance to abandon old working processes that are incompatible with the software. Some companies are also reluctant to let go of old software that worked well in the past. The key is to prevent ERP projects from being split into many smaller projects, which can result in cost overruns.

1.1.2 Educational Cloud ERP

When Cloud Enterprise Resource Planning or ERP software is implemented in an educational organization, it is termed as Educational ERP. The educational organization can vary in different structure and requirements.

Educational organization can be a high school with requirements of less student interactions and more focus of faculty and parent interaction. These require modules which collect information from office and faculty and interact with parents to display information like marks and attendance.

On the other hand, educational organizations can a play school where the focus is on child's special need, attendance and security. Timely notification to parents and interaction of the Cloud ERP with office staff.

The third category is when educational organization is a college of undergraduates or graduates. Here, the ERP needs to collect information from all segments of the organization like faculty, HOD, office, students as well as parents. This type of educational organization requires the most complex modules and their integration.

A typical Educational cloud ERP software which are available in the market have only limited number of modules like Accounts, Attendance, Marks, Communication, Student Information, Reports and Certificates. These are very limited and outdated modules which depend on obsolete technologies and do not provide the bigger picture.
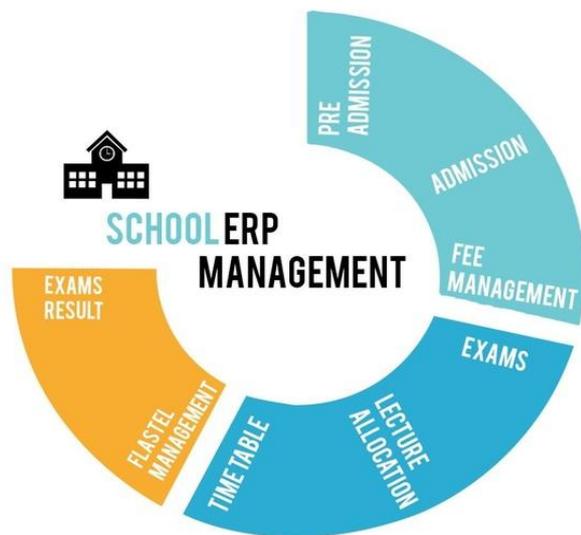

Figure 1.2: Modules in Educational ERP System

1.2 Motivation and Scope

With availability of outdated modules in the market for Educational ERP and scattered systems with outdated technologies, this study will compare the existing module and propose a final set of modules which can be implemented in any type of educational institution.

II. LITERATURE SURVEY

2.1. Cloud ERP Systems in Higher Education Institutions: Review of the data frameworks and ERP modules

This examination surveys the cloud enterprise resource planning (ERP)) frameworks in higher education institutions (HEIs), as an investigation like this is rare in writing. Since ERPs are comprised of modules, understanding modules intended for HEIs has stayed hazy. The ebb and flow landscape of research is dispersed with examination led fundamentally in disappointments or examples of overcoming adversity, or explicitly factors for progress during a module usage.

In any case, to this date there are no investigations that give extensive picture of cloud ERP modules for HEIs. This examination contributes by diminishing this hole by making an unmistakable refinement between the ERP modules in HEI and business. The consequence of this investigation demonstrates that it is questionable that standard apparatuses for business associations can be comparably connected in HEI. Or maybe, ERP frameworks in HEI are altogether different regarding usefulness and modules contrasted with corporate ERPs. The principle commitments of this examination is its innovation and is the primary investigation that furnishes a review of HEI ERP with the center and broadened modules, the functionalities and contrasts with the business EPRs.

Today the impact of innovation is seen as a changer of the scene wherein advanced education establishments work. The utilization of data frameworks and the uses of accessible advancements are developing logically. Existing data the board and key administration speculations, techniques and writing are unfit to depict, clarify, and demonstrate the effect of data frameworks in advanced education organizations.

The point of this investigation is to lessen the examination hole in regards to the methodologies of big business asset arranging (ERP) frameworks and data frameworks (IS) usage in advanced education organizations (HEIs). ERP frameworks that are based on hierarchical presumptions don't relate with the qualities of advanced education associations. Since ERPs are comprised of modules, the issue of having an intelligible image of the qualification between those that are for organizations and those for HEIs has stayed misty. The ebb and flow view of research is dissipated with examination led for the most part in disappointments or examples of overcoming adversity, or explicitly factors for progress during a module execution. A far reaching image of the IS and ERP modules for HEIs still stay vague. This examination contributed fundamentally to decrease this hole.

2.2 Implementing EPR Systems in Higher Education Institutes Critical Success Factors Revisited

The aim of our study is to investigate ERP project critical success factors (CSFs) with a focus on higher education institutes (HEIs).

We conducted a systematic literature review to identify specific CSFs affecting HEIs' project outcome. Building on these results, we led several interviews within selected German HEIs. Overall, there is little literature dealing with the HEIs' CSFs, but nearly all factors found in the literature were also mentioned by the interviewees. However, for HEIs, factors like ERP system tests or ERP system configuration are even more important than Top management support or Project management that are the most important CSFs in general studies. Our study shows that in spite of the maturity of the field, revisiting CSF research for specific types of organizations/institutions is still worthwhile.

These days, organizations should most likely productively and adequately respond to rising globalization just as changing markets and financial conditions. Notwithstanding, open administration and particularly higher education institutes (HEIs) for example, University and colleges of connected sciences are confronting comparable difficulties as private endeavors. They not just need to react to expansive changes in government and society yet in addition need to contend broadly and universally. Difficulties incorporate declining money related help from state-level governments, unusual vacillation of understudy numbers, globalization, and worldwide challenge among colleges just as expanding rivalry on the national dimension for understudies, researchers, and

Outsider assets. In this manner, because of these evolving conditions, colleges need the most noteworthy conceivable productivity and adequacy in their authoritative procedures as expressed by a few specialists.

III. REFERENCE MODEL

3.1 Achiever

Achiever is an Educational Cloud Enterprise Resource Management (ERP) application implemented in Secondary and Senior secondary school. It is hosted locally for few users and on cloud for few users depending on the availability and reliability of internet in their offices.

Achiever is mainly used by the staff and faculties of the schools and students get a very limited access to the system. This system is responsible to handle the information of students which includes marks, attendance, basic information, contact details, fees, transport information, parent's information, library identity etc. The system manages the accounts information and statements, library books, employee records, reports etc.

Achiever has different user roles for different types of users in the school. These are:
- Teacher
- Incharge
- Library
- Reception
- Accounts
- Principal
- Admin

Achiever has a set of modules used by the users for managing the school:
- Marks and Attendance
- Student Information
- Fees Management
- Reports and Report card
- Class management
- Transport Management
- Certificate Management
- Communication System
- Subject Management
- Employee Management
- Library Issue register
- Library Books Management
- Library User Management

The above modules are sufficient to manage a standard size school but lacks many advance technologies like implementation of Analytics into the reports are better exchange of information between the modules. Also, the system lacks the interaction with the student and their parents for proper exchange of information and student performance updates. It lacks the options for the parents and teacher interaction through the platform.
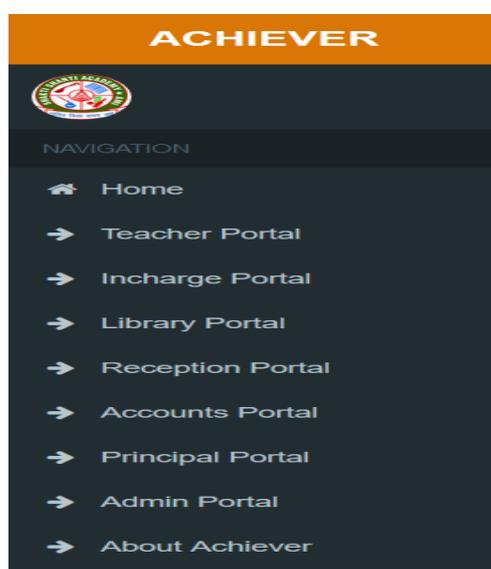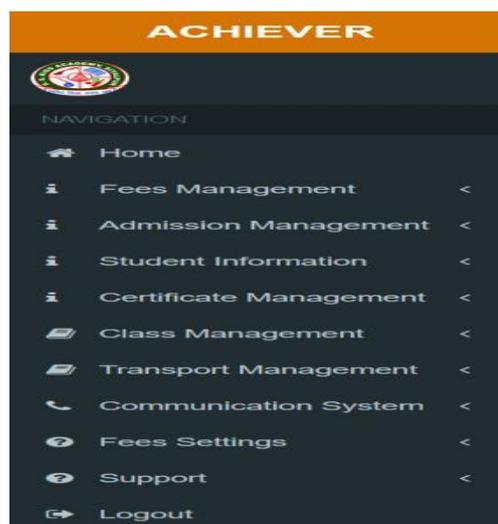

Figure 3.1: User roles in Achiever

Figure 3.2: Modules available in Accounts User role in Achiever

3.2 BMS Institute Mentoring System (BIMS)

BIMS is an Educational Enterprise Resource Management (ERP) application implemented in graduate and post-graduate college. It is hosted on the cloud to make it accessible from anywhere, anytime.

BIMS is mainly used by the staff and faculties of the college and students get a very limited access to the system. This system is responsible to handle the information of students which includes marks, attendance, basic information, contact details, parent's information, proctor details, meeting records, academic reports etc. The system manages the subject allotment, student batches, etc.

BIMS has different user roles for different types of users in the college. These are:

- Faculty
- Proctor
- HOD
- Chief Proctor
- Vice-principal
- Principal
- Admin

BIMS has a set of modules used by the users for managing the college:

- Marks and Attendance
- Student Information
- Student-Proctor Meetings
- Reports
- Subject management
- Proctor Management
- Communication System

The above modules can help in managing a college by supporting few activities in the college but lacks the new technologies and many more modules which can help in proper and efficient management of the college with the help of ERP system.

Figure 3.3: User roles available in BIMS

IV. METHODOLOGY

A proper educational ERP should be compatible with any type of educational institutes and should be scalable for any size of institute. The system should have all the required modules and should share data among themselves for proper utilization. These modules should use latest technologies for better results and reports.

4.1 Core Modules

- **Marks, grades and attendance**: This module should manage all the academic scores of the student. The faculties should have access to enter the data and generate reports using data analytics in the form of graphs. This should also allow the students and parents to check the marks of the student.
- **Student Information System:** This is an important module of Education ERP system and it should be diverse in nature to accommodate any and all information about the system regardless of the nature of data.
- **Human Resource Management:** ERP system is responsible to manage the human resource of the institution and give proper access to information to the employee. This module should also log the information about the performance and feedback of the and from the employee.
- **Financial Management:** This module should help in managing the financial activity of the institute with keeping records of all the transactions and fees related information of the students. This should provide timely notification of dues and ease of payment through online payment gateways.
- **Class and Subject management:** All the institutes will have different number of classes and courses and also different types of schemes for subjects. This module should be flexible to adopt any kind of schemes and patterns
- **Transport Management:** All the information related to transport vehicle, its route and fees should be available to concerned user. Also, the students availing the transport service should be charged transport fees via Financial Management System
- **Communication System:** SMS, Email and push notifications should be used to communicate with the students for proper interaction and timely updates to students, employees and parents.
- **Library Management:** Manages all the books in the library and also keeps record for the book issue register
- **Proctor Management:** Provide complete and timely information to proctor about their proctor students so that they can guide the students properly for better performance
- **Certificate Management:** System to store all the issued certificates and to generate and issue new required certificates
- **Feedback System:** It helps to get anonymous feedback from students, parents, employees to generate report about the performance or service in the institution.
- **Admission Management:** Using of technology to select good candidates from a pool of candidates for the right course in the institution.

4.2 Extended Modules

- Learning Management System (LMS)
- Facility Management
- Training & Placement
- Content Management System
- Research Management
- Customer Relationship Management (CRM)
- Grants Management System:

V. CONCLUSION

Many Educational ERP systems are available in the market. These systems are not compatible with all the educational institutes as they lack one or the other module. Also, the existing system does not utilize the data properly but not using the latest technologies likes data analytics.

This study compiles all the required modules for an Educational ERP which will be compatible with every type of educational institute irrespective of the course it provides or the number of students it has. It also provides the extended modules which can be implemented to further increase the utilization of the system in a school or college. It also has modules to make the system a communication medium between the student, faculties, parents and institute management.

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