Integral System for Automation of Education Board and IT Association using Cloud and Mobilink.

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Abstract— **Most of the educational boards and IT associates still use traditional and inefficient intellectual E-administration system for communicating with their valued clients. The clients may include the students in case of educational boards, employees considering the IT associates. Datasets that grows so large that they become awkward to work with using on-hand database management tools. With the increasing number of students and also the staff members this procedure, becomes troublesome for management, and also adds the problem of data storage. This paper presents the motivation and design of an integral system for automation of educational board and IT association using cloud and mobilink. The existing systems have shown some pitfalls regarding authentication of accessing administrative data. Thus it also involves authentication system considering the need of security. Integral system includes the domain of cloud computing as well as an android application and web-interface.**

Keywords- Authentication, Cloud computing, integral system, Security access.

I. INTRODUCTION

Considering the current scenario, issues in education board and information technology (IT) association management can be listed as erroneous manual work, growing datasets, storage problems, inefficient and unsecured administration system and less interactive communication method. Thus there is need of providing a complete solution which solves all these management and communication issues. The presence of IT in the era of globalization is well received by the industry because it can increase the efficiency and effectiveness of their management. But this technology has not been implemented uniformly in all layers of the industry, especially in small and medium scale enterprises (SMEs) like educational boards and institutes.In today's society, education heavily relies on information technologies and telecommunications. The educational use of mobile phones has evolved from numerical calculations, spreadsheets and word processors, to multimedia and web-based applications. With the rapid growth of Internet and the increasing popularity of the World Wide Web, web-based educational systems are becoming more attractive and integrating more functionality[1].

II. IMPLEMENTAION WITH DIFFERENT MODULES

Our proposed integral system aims at efficient implementation of the booming modern technology by integrating the modules which are most efficient in their respective domain for education board and IT association. In today's world, the working at education institutes are getting worse day by day, in order to bring some discipline and making it more efficient, this project is proposed. This project aims at integrating requirements of education board and by supporting them with the conclusions drawn from the data collected. The system is also an adaptable system which will give the output according to the current scenario and not on

predetermined conditions. This system will help bring some discipline to the working executed at administrative level and will also decrease human efforts and in turn human errors.

Following are the modules of proposed integral system. Each module has its own unique functionality and contributes towards making a foolproof integral solution

Figure1. Modules of Integral System.

A. Cloud Connect

Cloud computing is a delivery of computing as a service rather than a product, where by shared resources, software and information are provided to computers and other devices as a utility over a network. Proposed system offers cloud connect because cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources. So making use of these characteristics the proposed system will be beneficial to the clients by availing them reliable and scalable 24 x 7 active services. Storing data using cloud or giving access to client with the help of cloud is more beneficial as it gives broad network access and it requires lower capital expenditure. As cloud computing is an innovation that allows the use of information technology based on the on-demand utility. This technology can provide many benefits for educational boards and small institutes that have limitations on capital, human resources, and access to marketing network. So this system making use of the excellent features of cloud and storing the database on the cloud which provides option of scalability to the extending databases [2].

B. Web Interface

Educational web portal is single access point to all relevant information, resources and applications in the education process. Web portal integrates different functionalities and services for adaptation of e-learning course. Integration includes: educational web portal users, information, processes and software platforms used in e-learning system.

Main features of our educational web portal are:

(i) To give students easy access to diversity of useful information and students' services;

(ii) To open lines of interaction among the community users;

(iii) To allow both students and teachers to share information;

(iv) To provide a tool for faculties and universities to innovate teaching and a tool for students to experience alternative forms of learning [3].

Web interface will allow access the data of cloud, client must require interface which is interactive between cloud, client and administrator. This accessibility to cloud can be provided using a web portal. Web-portal is simply website that brings information from diverse sources in a unified way. Portals provide a way for association to provide a consistent look and feel with access control and procedures for multiple applications and databases, which otherwise would have been different entities altogether. The interfacing using the web portal will ensure the accessibility to the registered clients as well as authenticated administrator.

C. Authentication System

In case of public cloud infrastructure the information's are stored in cloud data centres. The users to access the existing data's before processing to verify the requested user is an authorized user or not. Considering a need of security, system must be consists of verified and validated administrator. Similarly access to the cloud and web-interface should be allowed to only registered or the members of association. This kind of authentication will dealt in proposed system using digital signature, barcode reading or biometric authentication.

Every association works at different administrative levels i.e. Association may include head office, principle co-ordinator, regional co-ordinator and local co-ordinator which works at local centres. Thus to provide a security according to administrative levels there is a need of some authentication levels, those will impart the secured accessing of data. In the proposed system authentication will be provided at adminstator's levels as well as at the client and portal side using hardware, supporting the different authentication approaches.

D. Mobilink

Recently, more and more people use smart mobile communication devices, such as smart phones and tablet computers. In institution of higher education, the student number owning mobile phones is far more than the one owning computers [4].

Although email is considered a high speed communication method, mobile alerts can be more effective.The proposed system will provide the integrated facility of sending messages or alerts via cloud to the specific individual recognized by the system as per urgency and client's need. Mobile alert system will provide faster and quicker service to clients which results into efficient working.

With the rapid development of mobile communication technology, mobile phone not only be used to call or send short messages, but also a smart tools, through which one can browse the web pages, send and receive e-mails, can view notifications and alerts via android apps and connectivity facilities. This system provides its users a very flexible and portable facility of viewing the notifications with the help of their android devices having basic connectivity feature. An additional feature of android application is that it provides notifications to its users according to their preferred courses so the initial filtration process is carried out by the application itself reducing the efforts of its users [4].
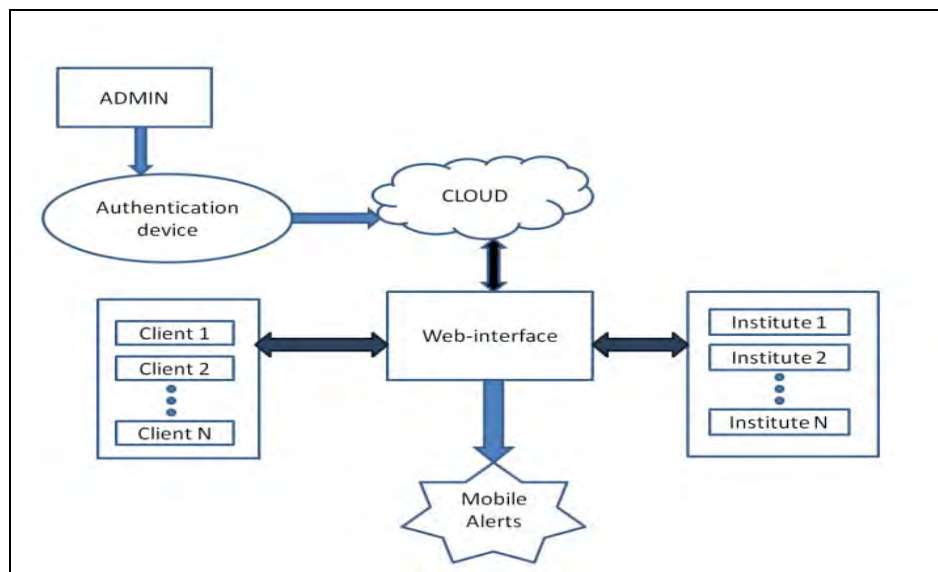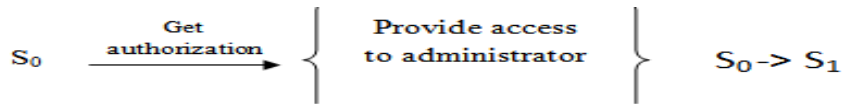

Figure 2.Integral System Overview
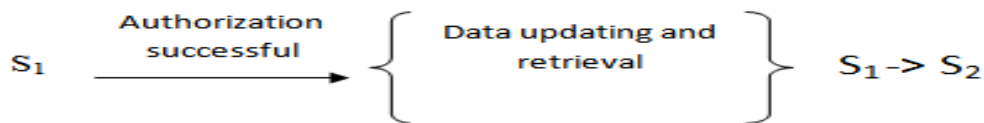
III. WORKING SCENARIO OF PROPOSED INTERGRAL SYSTEM

As stated above, the proposed integral system has four modules as cloud connect, web interface, authentication system and mobilink. The actual working of these four modules can be clear by studying following state transitions of the proposed system.

$$S_0 \xrightarrow[\text{authorization}]{\text{Get}} \Big\{ \text{Provide access to administrator} \Big\} \quad S_0 \rightarrow S_1$$
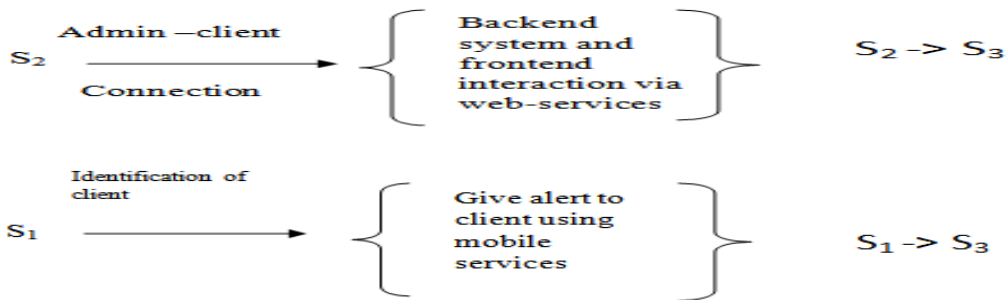
When a request for authorization is made by administrator at backend office then valid access notification is generated and it allows administrator to access data. A transition is made from state S_0 to S_1

$$S_1 \xrightarrow[\text{fails}]{\text{Authorization for } Q_i} \Big\{ \begin{array}{c} \text{Get next} \\ \text{authorization} \\ \text{administrator.} \end{array} \Big\} \quad S_1 \rightarrow S_0$$

If authorization fails, authorization for next administrator is tried. This is continued until registered or valid administrator get access.

$$S_1 \xrightarrow[]{\begin{array}{c} \text{Authorization} \\ \text{successful} \end{array}} \Big\{ \begin{array}{c} \text{Data updating and} \\ \text{retrieval} \end{array} \Big\} \quad S_1 \rightarrow S_2$$

Successful authorization provides particular facilities as per client requirements and also allows edition of information of cloud.

$$S_2 \xrightarrow[\text{Connection}]{\text{Admin} - \text{client}} \Big\{ \begin{array}{c} \text{Backend} \\ \text{system and} \\ \text{frontend} \\ \text{interaction via} \\ \text{web-services} \end{array} \Big\} \quad S_2 \rightarrow S_3$$

$$S_1 \xrightarrow[]{\begin{array}{c} \text{Identification of} \\ \text{client} \end{array}} \Big\{ \begin{array}{c} \text{Give alert to} \\ \text{client using} \\ \text{mobile} \\ \text{services} \end{array} \Big\} \quad S_1 \rightarrow S_3$$

The above process needs to be followed until information is provided as per priority of the clients.

$$S_3 \xrightarrow[]{\begin{array}{c} \text{Client Log out of} \\ \text{system} \end{array}} \textbf{Success}$$
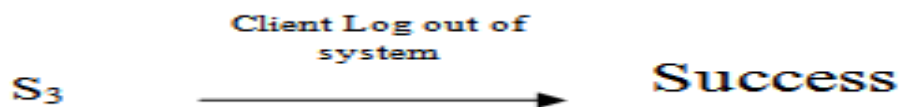
Thus when data from all available sources is converted into internal representation, then it determines a success state. When no sources are available gathered information is considered as NULL and results in a failure state.
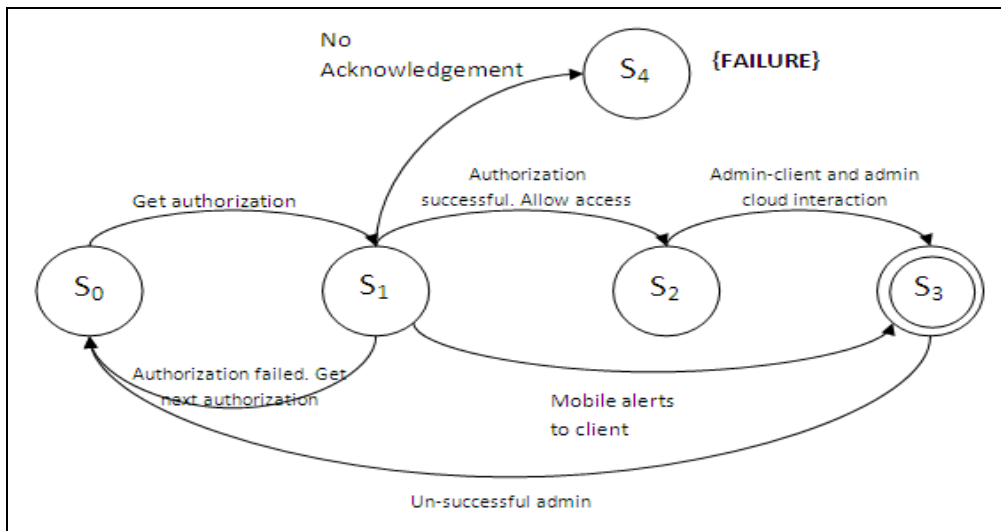
Figure 3.State Transition Diagram

IV. MAIN BENEFITS OF THE SYSTEM

Cloud connect offers 24 X 7 support, measured service, lower capital expenditure and promotes green computing[5]. Mobilink utilizes text messaging technology to alert individuals to a variety of time-sensitive information. This technology can be one of the best tools to use when numerous people need to be informed on short notice. The proposed system will provide the integrated facility of sending messages or alerts via cloud to the specific individual recognized by the system as per urgency and client's need. Mobile alert system will provide faster and quicker service to clients which results into efficient working. Presence of authentication system at the backend office allows access of cloud data to valid administrators. An interactive web interface is implemented through integration of services and applications that enables collaboration and communication among users in education system, realization of all activities, as well as adaptive functionalities. The integral system as a whole strives hard for better management of various education boards and IT associations. The android application will provide information as per requirement of client on the basis of parameters like details of courses, available registered institutes. There will be a provision of grading or rating system implemented on registered institutes to show the user best available institutes. The application will also provide study material in free time of client.

V. APPLICATION OF INTEGRAL SYSTEM:SMALL AND ENDIUM SCALE ENTERPRISES

Small and Medium Enterprises (SMEs) are always looking for automation and technologies to improve their business operation in the most cost effective way possible, especially to save operational cost. In house software solutions and network infrastructure historically have been one such solution to help them accomplish this. However, these technologies were out of reach for SMEs due to cost constraints and necessary staffs required to monitor and administer these applications. That all changed with the advent of cloud based solutions and applications, which provide cost effective and easily accessible way to incorporate more powerful and more reliable hardware and software programs into their operations. Recent studies have shown that could technologies are helping small businesses not only in making servers more dependable but helping them to prepare for disaster. The survey found that more than 40 percent of SMEs are deploying public cloud in their operation while 43 percent using private clouds. Moreover, same percentage of businesses is now taking the advantage of mobile and tablets devices for business use [6].

The proposed integral system offers a simple way to use best technologies from the current market. It cuts down the requirement of setting up a huge infrastructure and thus reduces expenses of the organisation. The proposed integral system does not require an entire IT team to handle it. Thus absence of internal IT does not affect usage of this system. Two-three members within the organisation can operate it effectively. It allows SMEs to focus on their key business areas. Ecosystem connectivity enables information exchange across business partners. About a one third of survey respondents like how cloud better facilitates external collaboration with partners and customers. This integral system i.e. software-as-a-service solution facilitates better collaboration and information sharing, helping deliver improved care at a low cost, particularly important in growing markets [7].

VI. FUTURE SCOPE AND CONCLUSION

Future work can be directed towards deploying this system on a private cloud, improving adaptation mechanism and automation using machine learning.

Due to cost and time factor we have currently deployed this proposed system on public cloud. But each client has a different requirement. So if the user requires, this system can be shifted on private cloud too. Deploying this system on private cloud provides various advantages like user can self design the cloud architecture and there will guaranteed network access. With introduction to machine learning we can write an algorithm to recognize user search. With context-driven variability, intelligent assistants are possible. Because of its expanded computing power and capacity, cloud can store information about user preferences, which can enable product or service customization. More than 50% of respondents to a survey see this as an advantage for addressing fragmented user preferences. In a nutshell, it leverages the computing capabilities and capacity of cloud to enable individualized, context-relevant customer experiences [7].

Statistical analysis for distribution of load among educational institutes can also be performed since data of client as well as institute is present on the cloud .For instance, if an institute A has heavy load for C# course during summer batch, system should give options to the client to join other institutes.

In this paper we have proposed an approach for implementation of an integral system which offers complete solution to today's education board and IT association issues. Considering the need of simplification, ease of use and ease of maintenance this system strives for interactive communication and betterment of small and medium scale enterprises. System is implemented through integration of services and applications that enables collaboration among users in e-education system. Future researches can be directed towards improving adaptation mechanism and automation using machine learning.

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