**Multi-Tenant System for Digital School**

**Introduction**

Currently there are a lot of new schools coming up in many cities and towns in India. A lot of schools have setup their IT infrastructure, but this is limited to bigger schools or school chains. Many small schools even in big cities rely on manual processes. With the penetration of smart phones and tablets, there is an opportunity to start digitalizing these schools. The main objective of my project ‘Digital School’, is to provide a software support solution for schools, to make use of the digital devices like tablets, cell phones, computers to provide students and their parents, an easier access to the day to day activities of the school. The objective of this research is to host a ‘Software as a Service’ application on Microsoft Azure cloud and deploy it on the Internet[5][6]. Digitizing schools refers to reducing a lot of manual effort which is required in performing small activities by teachers, students, as well as parents. The motivation behind constructing such a system is to automate certain processes of the school, thus reducing manual intervention. Also, the system will work on a cloud based platform, thus the user will not have to worry about any updates, security concerns and system memory.

**Purpose**

The main objective of the project ‘Digital School’ is to provide a software support solution for schools, to make use of the digital devices like tablets, cell phones, computers to provide students of the school and their parents, an easier access to the day to day activities of the school. This software aims to reduce the paper work and the time involved in processes of schools like, the payment of fees, submission of leave notes, notices to be displayed, homework assignments given to the students, feedback from the parents about the school and so on. This system also introduces the feature of buying used textbooks from other students of the school. Career recommendation module of this system, recommends a career path for a student, depending on his marks and provides some advanced study materials or resources about the subjects of his interest. There will be a section which will provide online tests for various subjects. Moreover, this system will dynamically allocate students to appropriate buses, to maximize the efficiency and saving time and fuel. Thus, this will become an all in one system for school management and will successfully complete the task of minimizing human efforts involved in tedious tasks by the smart software which will incur cost savings than the traditional methods. This project will be a part of the Smart City Initiative.

Thus, we aim to make a robust multi-tenant, cloud based systems for schools to serve as a web portal for school’s various activities. The goal is also to create a SaaS Application for multiple schools (cloud tenants) who can use this software at the same time[8]. Thus, this will bring uniformity if all the schools in the city or state use the same system in the process learning which will further lead to equal opportunities of enhancement and development of skills among students. This system will provide ‘more with less’ as only a working internet connection will be required to use this application, and rest all the requirements will be handled by Azure cloud. We will make use of various Azure cloud services for authentication, scheduling, SQL, storage, etc [9]. Thus, we aim to develop a robust multi-tenant, cloud-based system for schools to serve as a web portal for their daily activities [1].

**Significance**

Most of the schools in India do not use digital portals or websites for the school’s day to day activities. Many schools even in developed cities like Pune use manual processing methods for daily activities involving the students or their parents. If a digital portal is developed for such schools, it will become extremely easy for the parents to stay in touch of their child’s day to day activities using the portal and it will also be beneficial for the students to get information through such websites instead of using the pen and paper mode for everything.

Thus, we plan to make a system which will provide easy access to the ongoing activities of the schools, and provide certain features which would make the lives of the students and parents a bit easier by designing a SAAS application for schools, to digitize multiple functionalities and provide a portal for its activities. SAAS application will be deployed as a multi-tenant service on Azure cloud [2].

**Project Design**

System Architecture:

The system can be accessed by multiple tenants at the same time and each tenant will feel that he is the only user of the system. Every user can access the system using digital devices like smart phones, tablets, laptops, desktop computers etc.

**Figure 1: System Architecture Figure 2: Deployment of Software using Azure Cloud**

Algorithmic Methodology and Experimental Evaluation:

1) Acquiring databases from schools.

2) Subscribing to Microsoft Azure and keeping the use limited to free version limits.

3) Using .NET for basic UI designs of all the modules.

4) Module by module implementation of the system, keeping in mind the multi-tenant nature requirement of the final software.

5) Deployment of software using Azure cloud.

As the proposed project works in a Microsoft Azure environment which is a cloud computing platform and infrastructure, multiple schools will use the same system, but will be provided an abstracted view of the system, such that no information of one school will be provided to another school. User is not given access to any content before login credentials are verified. The application GUI is simple, easy to use and to understand. As the cloud uses a pay per use model of payment, the scale up or scale down is rapid according to the number of customers using the software at that time, as it will be essential for very high cost savings while using Azure cloud services [7][9].

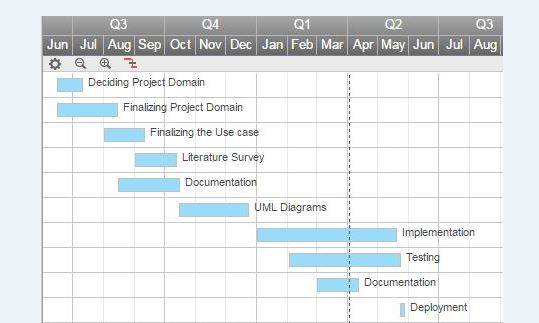
**Dissemination**

* + - * + Paper Publication: International Journal of Computer Applications (0975-8887)
* Paper Title: Digitizing Schools using Azure platform
* Paper accepted/rejected: Accepted and Published
* Review comments by reviewer: Deemed as an invention and published on May 3,2016
* Publication: Digitizing Schools using Azure Platform in International Journal of Computer Applications (0975-8887) <http://www.ijcaonline.org/proceedings/ncacit2016/number4/24718-3058>
  + - * + Conference: 2nd National Conference on Advancements in Computer and Info. Technology (NCACIT) ISBN:978-93-5258-291-4
        + Best Paper Presentation Award at National Conference on Advancements in Computer & Information Technology (2016)

**Work Completed**

Literature survey and project planning is done. All the project functionalities are finalized. Database schemas are created. The project use cases are finalized.

Refer Figure 3 for more details of the project plan.



**Figure 3: Project Planning Year 2017-18**

**Budget**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sr.No. | Item | Parameter and Minimum Requirement | Cost | Justification |
| 1. | Desktop system | Intel core i7, Octa core, 16 GB RAM, | $700 | For efficient working of IDE and Web Standalone Server |
| 2. | Microsoft Azure Cloud subscription | App Service, Active Directory Storage, SQL Database, | $200 | For deploying and managing application on cloud. To use its services like security, load balancing and automatic updates. |
| Total Request |  |  | $900 |  |

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