

Intranet based ubiquitous computing for smart classroom using smart phone

KishorChafekanade¹, Sandip Hange², Pankaj Powar³, Virendra Zond⁴

Prof. M. K. Kekade⁵

Department of computer science and Engineering,

1 to 5 D.Y.Patil College of Engineering & Technologies, KasbaBawada, Kolhapur(India)

ABSTRACT

The idea behind this project is reducing the cost and improving the quality of service in this technology aided learning. Here, The laptop's are replaced with Raspberry Pi. It will also help in improving the quality of service as device will consume less amount of power. The proposed system will be controlled by using a smart phone which will be more convenient. In this system, we are also going to develop a mobile application for Admin and Student. This application includes two modules namely Student and Admin. After the registration procedure, user can login in his/her account. Admin is able to upload the documents for students. Admin can able to send Notifications such as the meeting schedule, events, alerts etc.

Keywords: Raspberry pi, wireless interface

1. INTRODUCTION

Now a days, many classrooms have equipped with variety of advanced information devices. This type of system is called as smart classroom system. Learning style of students is changing in this fast growing world. Traditional style requires to be reviewed to determine their suitability to meet the needs of student learning styles. As the world around us changes, it is essential that this system review their teaching methods to ensure there is an appropriate match to students learning styles.

Ubiquitous computing is a concept where processors and sensors are embedded in various physical objects to form a network and communicate information. Using this concept the focus of faculty-students interaction with the environment is through heterogeneous devices connected to a gateway.

The proposed system is helpful in reducing the cost and improving the quality of service in this technology aided learning. With the help of proposed system, the laptop or any other portable device will get replaced with Raspberry Pi and thus helps in cost reduction. The web interface of raspberry pi will be used to access files stored on server and view them through projector. Android application will be developed to handle all the activities such as uploading and downloading files etc.

2. ARCHITECTURE

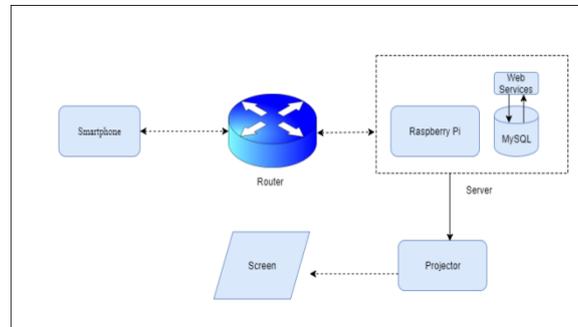


Fig.1 System Architecture

As depicted in Fig.1, the smartphone device with a developed android application is connected to the projector using raspberry pi. The user can also access the data stored at server by using the android application. The user can be admin user (Faculty) or student. Admin will have access rights to upload the data to the server. They can also download and modify the data. Student user can only download the data from the server. It is maintained, operated and managed by a storage service provider on storage servers that are built on virtualization techniques. The server will have different storage units for different departments and only the admin or student of that department can access that particular unit of the server. The faculty can login with their login details. Once the faculty has been logged in, he/she can upload/download the required study material. The android application has a connectivity with the projector through raspberry pi device. Therefore, the faculty can access the projector and start the class from any corner of the classroom without using laptop

3.IMPLEMENTATION

3.1 Android Application

An android application will be used for uploading and downloading the study material. Every user that is faculty or student have to first register. Once the registration is complete the user can login with their login credentials. The admin (Faculty) can upload and download the study material and the student (user) can only download the study material as required.

- Staff -> Registration / login
- Student -> Registration / login

Here faculty can upload the documents, view those uploaded documents, also open it through Raspberry Pi. Faculty can sends notifications and alerts also can view the student profile. Whereas student can search those uploaded documents, view them and also can download .Students can view those notices and alerts which will be send by faculty.

The application has also connected with raspberry pi, so that faculty can access the application from any corner of the classroom and deliver the lecture by using developed android application without using laptop.

3.2 Web Services

Web services are XML-based information exchange systems that use the Internet for direct application-to-application interaction. The basic web services platform is XML + HTTP. All the standard web services work using the following components

- SOAP (Simple Object Access Protocol)
- UDDI (Universal Description, Discovery and Integration)
- WSDL (Web Services Description Language)

A PHP web service will be deployed web service which will be called by android application and those services will return data to android application in the form of JSON.

3.3 Raspberry pi server configuration

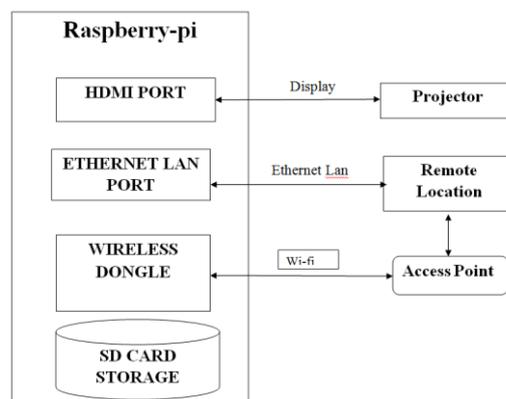


Fig.2 RB-pi Configuration

The connectivity of raspberry pi as shown in Fig.2. It comprises of a 1GB RAM model with four USB ports and a 10/100 Ethernet controller. The figure above shows the model. It exhibits the Broad com BCM2835 ARM11 700Mhz 'System on Chip' Processor. One can program as well as learn programming conveniently due to the presence of the free, versatile, and highly developer friendly Debian GNU/Linux Operating System.

4. RESULTS

Following are results of our project

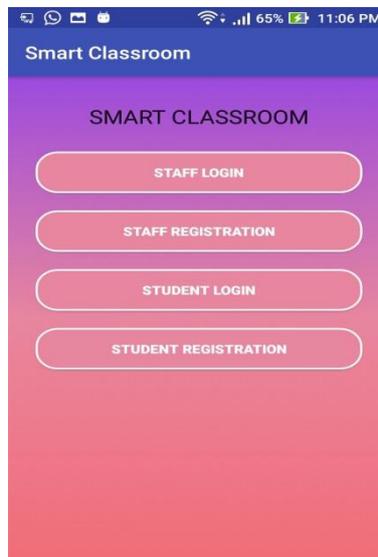


Fig.3 Home Page

As shown in Fig.3 contains the four credentials by using these credentials staff or student can login into the system or otherwise complete the registration and login with proper login credentials.

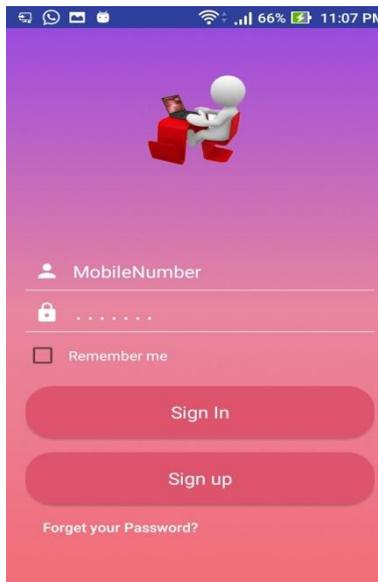


Fig.4 Login Page

The figure 4 shows the login page. By using Login credentials user can login in to system.

5.CONCLUSION

This system creates an innovative platform for teachers to use their android phones like as controlling device. This product indeed has tremendous potential of replacing laptops, especially for the particular application of storage and projecting.

REFERENCES

- [1]. J. Lee, Y. Park and M. Suk Cha, "Smart Classroom: Converging Smart Technologies, Novel Content and Advanced Pedagogies for Future of Education", Journal of Education and Vocational Research. 4, No. 1, pp. 5-9, Jan 2013.
- [2]. I. Singh and J. Kaur, "Ubiquitous computing: everywhere and anywhere", International Journal of Research in Computer Applications & Information Technology, Volume-2, Issue-3, May-June, pp.01-08, 2014.
- [3]. C. Jiang, Y. Shi, G. Xu and W. Xie, "Classroom in the era of ubiquitous computing smart classroom".
- [4]. Yuanchun Shi, Weijun Qin, YueSuo, Xin Xiao" Smart Classroom: Bringing Pervasive Computing into Distance Learning".
- [5]. Smart Classroom: Design of a gateway for Ubiquitous Classroom Hichem BARGAOUI, Rawia BDIWI
- [6]. Upton, Eben, and Gareth Halfacree. Raspberry Pi User Guide. John Wiley & Sons, 2012