Smart Campus

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Abstract- Nowadays the electronic techniques are advanced, and smart phones are equipped with powerful processors and large memories. A smart campus can be seen as a smaller version of smart city. As it is observed that providing the data by faculties to students is difficult and also students to acquire the important notices and required files, a system is designed to view important information by the students using an application by Wi-Fi connectivity. This will help in better sharing and spread of important message or information amongst the campus students. The students will get required data and important message through the application and will be able to download the required files and other information. Also using the application light and fan can be controlled.

Keywords—smart phone, Wi-Fi, application

I. INTRODUCTION

In today's system of college management, the students and teachers have to communicate everyday for certain activities. The notice or any other sort of information is to be spread through either or internet access, this might consume a lot of effort as the paperwork is slow and also everyone at college may or may not have the privilege of internet access. The current process of information sharing has problems such as

• Notices are shared on paper from class to class.

• searching backdate data might be difficult.

• manual process may cause error.

• every student or faculty in the college may not have access to the internet.

• excessive use of paper and other resources.

As the electronic techniques advanced, computing machines have been miniaturized and smart phones are equipped with powerful processors and large memories. In the consequence, various services become available on smart phones. Since a smart phone is a personal belonging it is an excellent candidate device on which a context-aware services provided. As an example of context-aware service on smart phones we have picked the campus guide and we are introducing our implementation of it in this paper. The smart campus consists of the server and the client. The main features of the client include sharing of information and important data between the client and server in android mobile phones. This will help in better sharing and spread of important message or information amongst the campus students. The students can get the required data and important messages through the application. With the use of same application, we can control the electrical appliances also. The application does not need internet access hence no internet service is mandatory. The application only is needed to be connected to the raspberry pi Wi-Fi in the college or department premises. This proposed system will ease the communication and data sharing without using the resources such as papers, manual effort, and internet connection.

II. MOTIVATION

The present day smart campus systems propose the application of knowing or measuring the area of a building or classrooms in a college etc. The other smart campus system proposes the application such that the location of a user using the android app in the college area or campus area can be known through the android app. The major issue in the college or a campus is the difficulty of data sharing amongst the students and the staff. While many of the users are not connected to the internet facility among the college hours and also the important notices are to be displayed on the notice board or shared from class to class increasing the manual effort. This process might be time consuming and also cause manual error and also is the problem of controlling the light and fan in the classes where one has to go and manually switch on/off the appliances. In this smart campus project this issue can be solved by using the android app and raspberry pi module where a student can access the data sent by teacher on the wi-fi module and also the power control is added so that the light and fan control can be done in the range of raspberry pi.

III. LITERATURE SURVEY

The main focus of this project is targeted at colleges and the synchronization of all the sparse and diverse information regarding regular college schedule. Generally, students face problems in receiving important notifications at right time, sometimes important notices such as campus interview, training and placement events, holidays and special announcements. Smart Campus bridge this gap between students, teachers and college administrators. Therefore, in the real-world scenario, such as college campus, the information in the form of notices, oral communication, can be directly communicated through the android devices and can be made available for the students and teachers and the maintenance of application will be easier in later future.

The paper presents the planning and design of smart campus construction. It mainly discusses the construction of Internet of Things based on ubiquitous network and the construction of cloud data center. A more humane and high-efficiency learning and living environment can be built by establishing Internet of Things based on ubiquitous network because it can transform traditional passive service to active service. Meanwhile, building cloud data center by utilizing virtualization can endow it with storage capacity and computation capacity which are more extensible and more efficient, and aspects, such as robustness, reliability and security, can also be improved greatly.

The paper presents the design and implementation of a home security system to detect an intruder at home when nobody is present. The low-cost security system uses a small Pyroelectric Infrared module, Infrared sensor and is built around ARM7 microcontroller. Presence of individual is detected when the system senses the signal generated by many sensors. The system sends a message to the user through GSM modem after detecting the presence of unauthorized person. The user then monitors the intrusion from anywhere, on an Internet enabled device by using IP address of the installed IP webcam of mobile in home, and alerts the neighbors and police. The user can also save the images and record the videos.

The paper first introduces the application of the internet of things and the cloud computing in education. Then discussed the current status of smart campus and the difference between digital campus and smart campus. By the means of raising the model and application framework of smart campus based on the cloud computing and the internet of things, analyzed the function and construct a safe, stable, green, efficient campus, and make smart campus as integral part of the smart earth.

The paper presents Automatic lighting and control using Arduino for the efficient use of energy in Class room condition where the class room are divided into grids. The system controls lighting in particular area of class room based on the presence of human using relay control compared to the one placed in ceiling which would switch on or off based on presence of human in room irrespective of position. In addition to relay control, it also provides mobility and remote command execution to system using Android mobile App via Bluetooth to control lighting based on voice command.

The paper proposes a high-level framework for a peer-to-peer protocol with the constraints addressed. In addition, it investigates the feasibility of a practical implementation of a peer-to-peer file sharing model on smartphones, including an analysis of how performance is impacted by various variables that can be dynamically controlled in the protocol. Through experimentation on smartphones, it gives various strategies, including minimizing the upload-to-download ratio to conserve battery life, using larger file segments to increase throughput, and using sockets to decrease memory overhead.

IV. ALGORITHM

Start

Change the directory path to location at predefined path

Set the direction of GPIO pin to output

Open the socket with fixed port number

To accept connections, the following steps are performed:

1. A socket is created with socket().

2.The socket is bound to a local address using bind(), so that other sockets may be connect()ed to it.

3.A willingness to accept incoming connections and a queue limit for incoming connections are specified with listen().

4. Connect socket With connect() method

5. Connections are accepted with accept().

6. Read the data on socket 1 byte

7. Convert that byte from ascii to int by atoi() function

8. Check the byte put into the switch case

9 if switch case 1:

   ➢ Read file data from client and save on server
   ➢ First read file size
   ➢ Allocate memory to read filename using malloc()
   ➢ Now read actual file data
   ➢ Now read name of file, for that first read size of filename
   ➢ Allocate memory to read filename
   ➢ Now read actual file data
   ➢ Write file data into file
   ➢ Free the allocated memory in malloc() fuction

9 if switch case 2:

- ➢ Now read pathname, for that first read size of pathname
- ➢ Allocate memory to read pathname using malloc()
- ➢ Now read actual path data
- ➢ Now pass the directory path for list_dir() function
- ➢ From this function return value are file and directory listing and it's length
- ➢ Write the data on socket it's file and directory length and it's length

- ➢ Free the allocated memory in malloc() fuction

11 if switch case 3:

- ➢ Now read file, for that first read size of filename
- ➢ Allocate memory to read pathname using malloc()
- ➢ Now read actual filename
- ➢ Now read the filename with fread() function and it will return the file content and length of the file name
- ➢ Write the file length and file content on socket
- ➢ Free the allocated memory in malloc() function

12 if switch case 4:

- ➢ Device 1will get turn ON

13 if switch case 5:

- ➢ Device 1will get turn OFF

14 if switch case 6:

- ➢ Device 2will get turn ON

15 if switch case 7:

- ➢ Device 2will get turn OFF

16 if switch case 0:

- ➢ All devices are OFF

V. METHODOLOGY

Various services become available on smart phones. Since a smart phone is a personal belonging it is an excellent device on which a context-aware services are provided. As an example of context-aware service on smart phones we have picked the campus guide. The smart campus consists of the server and the client. The main features of the client include sharing of information and important data between the client and server in android mobile phones. This will help in better sharing and spread of important message or information amongst the campus students. The students can access the required data and important messages through the application. As it becomes difficult to enter into every classroom or lab to switch on or off the lights and fans, this system will also include to control it remotely. Using the same application lights and fans can also be controlled.
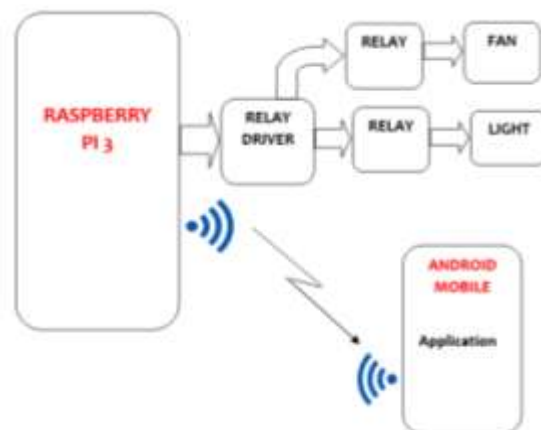

Fig 1: Block diagram of the system

The system works as a storage medium plus being wi-fi enabled which uploads the information on web server designed for our application. We are able to turn On/Off the devices like fan or lights remotely from server with the help of raspberry Pi and relay assembly. The uploaded file will be stored in cloud storage and can be viewed or downloaded using an android application.

The system uses a raspberry pi 3 version as the heart of the system which will look after the whole communication in the system. In this the Wi-Fi of the raspberry pi will be used as a medium to connect the android apps. The program such as socket programming is used for the communication purpose where an app is designed in such a way that it can be accessed by an authorized person only. If a student has to access the app they will be given a separate password and id, and if a faculty has to access the app they will have a different password and id. Thus, system also prevent the privacy of the users and miscommunication occurrence.

The memory of the raspberry pi will be used as a storage unit for the data being uploaded, this it will work as a cloud memory for the android app. The android app will have options such as upload, download, view, etc. The GUI design will be different for teachers and students based on their respective login as a faculty or as a student. This GUI is created using the eclipse software. The faculty can also control the electrical appliances of the department using their android app whereas student's login will not be provided with this extra feature. This option will only be provided in the faculty login GUI.

VI. APPLICATION

This system is useful for easy communication between students and the faculty without the use of internet access and paper wastage. The system GUI will differ from user to user depending upon their login as a faculty or as a student. The faculties with their own login can also operate the fans and lights in a particular classroom.

VII. CONCLUSION

After all the survey of different smart campus systems, a smart campus can be implemented. It will give easy access to students for getting the required notes and important notices by using an application and will also be able to download. All the devices will be connected through wi-fi using an application on android phone. The system makes the task of sharing files and important data easy. Using the same application light and fan are also controlled. Which will reduce the human effort of sharing the important notice from class to class or faculty to students and will also help in the light control from a distance instead of manually going to the place and switching it ON/OFF. It will also be easier to access the previously shared information.

ACKNOWLEDGEMENTS

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