Bluetooth Based Attendance Management System

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Abstract-These days, instructors in universities and colleges take the attendance manually either by calling out individual's name or by passing around an attendance sheet for student's signature to confirm his/her presence. Using these methods is both cumbersome and time-consuming. Therefore a method of taking attendance using instructor's mobile telephone has been presented in this paper which is paperless, quick, and accurate. An application software installed in the instructor's mobile telephone enables it to query students' mobile telephone via Bluetooth connection and, through transfer of students' mobile telephones' Media Access Control (MAC) addresses to the instructor's mobile telephone, presence of the student can be confirmed. Moreover, detailed record of a student's attendance can also be generated for printing and filing, if needed.

Keywords – Attendance Management System,Authentication,Biometric,Bluetooth,Mobile Phone,MAC,RFID

I. INTRODUCTION

Student Attendance System is a project based on Bluetooth and RFID reader application.These projects are developing to take learner attendant during class hour as the students enter the class or lab. This RFID reader gets the student information through student matrix card.After get the student information, it will send to the computer in that class or lab. After that the individual in charge (professor, staff, and student) must connect to the PC using Bluetooth to make his/her see the student attendant in that class. These systems are to avoid student cheating about their attendant. At the same time, this system will send a student attendance details to the lecturer e-mail after the class dismiss. Bluetooth based new wireless applications can add comfort and security by automation of the tasks earlier controlled manually. In this paper advantages of low cost, low power and robustness of Bluetooth have been exploited to propose and execute two new consumer systems in the form of a garage door opening system and an electronic attendance record system.

A. Problem definition:

This project is derived from a topic suggested by Mr. H.R. Gerber for the development of an automated class attendance recording device. The device must positively identify students and provide reliable class attendance logs for the benefit of students, lecturers and the University, as described in the previous section. Attendance logs must be stored on a centralised database in order to generate reports and statistics. Therefore, the device must be able to communicate with a central database server. Students should be able to access information and personalized reports generated by the system for effective self-assessment and keeping up to date. Lecturers should be able to view attendance information and be able to add information to the system.

B. Goal–

The reason of the development of biometric system is to take student attendance more efficiently. This method uses the student's matrix card to track student's attendance and sent information to the computer and the computer will send data to a mobile phone lecturer. The listing of students will be automatic, quicker and more security intensive than current methods of registration.

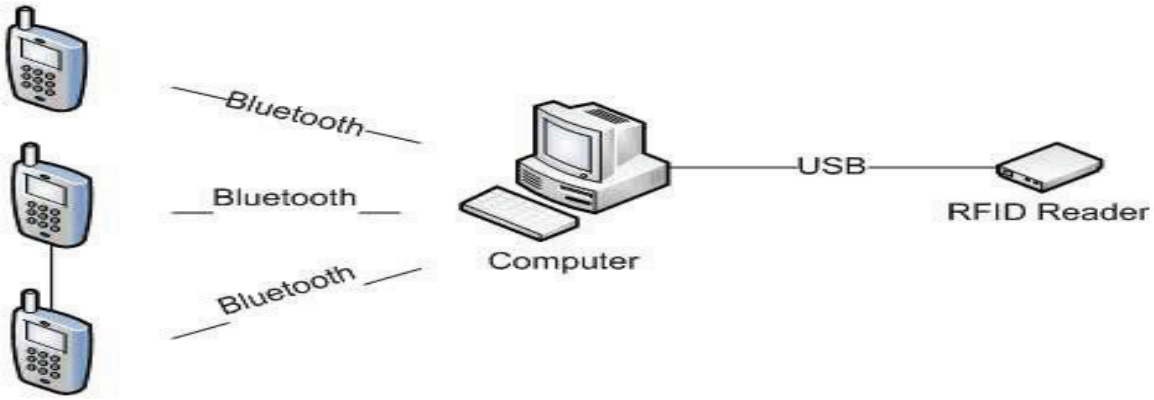


Figure 1.Bluetooth Based Attendance System

C. Attendance Management System-

Attendance Management System is the easiest way to keep track of attendance for community organizations such as school clubs, scouting units, church groups, athletics, or volunteer groups. Attendance Management System covers the requirements of the Personnel Department in terms of Manpower Analysis, day-to-day monitoring of the Attendance, Maintaining Statutory Registers, Monitoring of Leave Records, Calculation of Overtime and transfer of relevant information to the Payroll System. We can classify the attendance management system to four classes:

1. Simple systems: card based. The use of the attendance card is not new. Widely popular for many years now, OTR cards or punch cards have been used for clocking in working hours. These are paper cards that are inserted in a machine which will then record the exact time when the employee has arrived. The paper cards have eventually been replaced by sturdier cards that are sized just like the bank card or ID. In fact, some ID cards issued by companies can also be used for time keeping and are inserted into digital time recorders. An issue with the attendance card is that some workers will actually ask co-workers to time in for them. Some have attempted to remedy this dilemma through the use of signature logs that are attached next to the attendance recorder.

2. Large-scale companies: Attendance fingerprint. If you want something that is more precise and unlikely to be tampered with by the naughty employee, the fingerprint based attendance system is the choice for you. These systems make use of fingerprint readers, or little glass panels attached to the attendance machine. The employees will simply put their fingerprints on the reader which will then scan the print and identify the employee. The fingerprint readers will then automatically log in the employee on an electronic database.

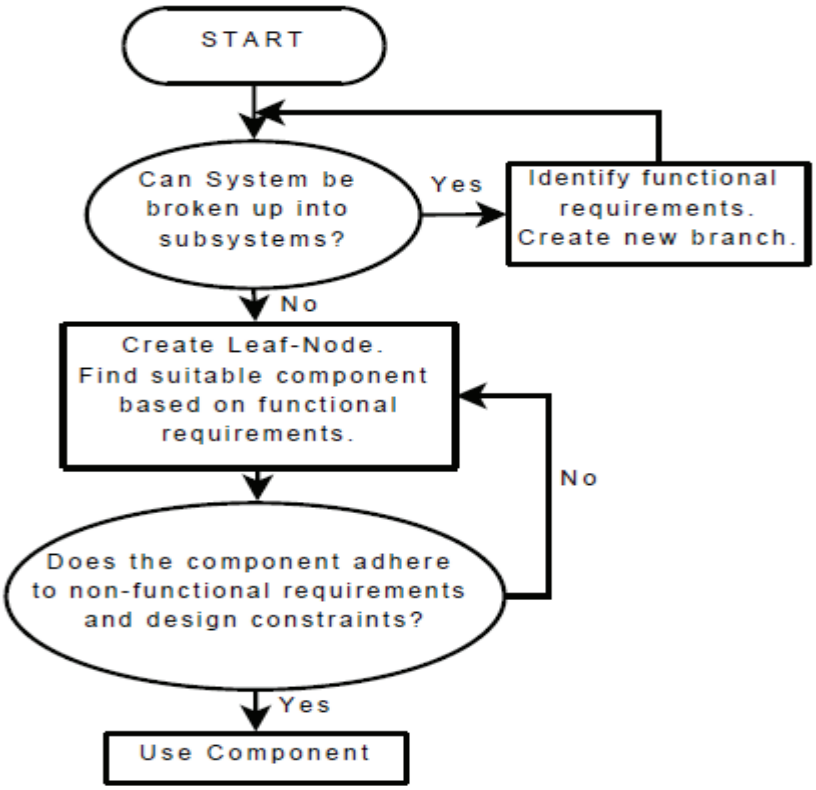
3. There are other variants to the fingerprint reader, such as the iris scanner. Like the fingerprint, no two people have the same eyes. A scanner will scan the eyes and automatically log the employee in. keep in mind, however, that these high technology systems are much more expensive than the usual card reader. You will also need to create a fingerprint or iris database from all of your employees so that the scanners will be able to make comparisons. The theoretical study and the experiments show that the Iris recognition mechanism is the most accurate and reliable recognition system, for this reason our article is based on iris recognition
   .

4. E-Commerce: performance based systems. Finally, there is performance based attendance keeping systems. These are increasingly being utilized to ensure not only employee attendance, but their productivity and efficiency as well. an example are the computer companies and online companies that will log in the employee based on factors such as when the employee logs in to the company web site or computer, and other activities such as mouse clicks, and keyboard taps. This is still in the experimental phase, however, but is widely being studied by many companies. One major limitation, however, is that these attendance keeping systems will not work for companies and business that do not require the emplouees to make high use of the computer.

II. PROPOSED ALGORITHM

A. System Analysis and Design

The design approach used in this project involves breaking the main system up into subsystems called 'branches'. Each subsystem branch may be broken up further into subbranches, and subbranches may again be broken up into 'leaf-nodes', which represent the lowest level of subsystems. This method forms a tree-like structure overview of the system as represented in figure 2.2. In this way, system level analysis and design is done by looking at the overlaying structure of the system, while detail design is limited to the leaf nodes. At the lowest level, components and design methods are chosen based on functional and non-functional requirements and design constraints. Once the lowest levels of sub-systems are designed, they are integrated and tested in a 'Bottom-up' approach until all subsystem branches are combined into the all encompassing top-level system. In essence, a 'Top-Down' analysis and design method with 'Bottom-Up' integration and testing process is used. Figure 2.1 is a flow-chart representation specifying the design approach used for this project, with inherent awareness of design constraints and limitations. Focusing on designing subsystems provides an advantage in that once one sub-system's design is completed, it may be sent in for manufacturing while design of the other subsystems can continue in parallel with manufacturing, which saves time. If one subsystem fails, it can be redesigned without influencing other sub-systems, and in this way valuable time is saved.



B. Fundamental Concept In Basic System–

This system will implement at class room and laboratory. This system is use to take students attendance by RFID and the data will be sent to mobile phone. The purpose of this system development is to take student attendance more efficient. This system using student metrics card to detect the student attendance and sent the information to computer and computer will sent the data to lecturer hand phone. This system will be implementing at classroom and laboratory. The system will be implemented in classrooms and laboratories. This system is used to take attendance by RFID and data will be sent to the mobile phone using Bluetooth. The purpose of the development of biometric system is to take student attendance more efficiently. This system uses the student's matrix card to track student's attendance and sent information to the computer and the computer will send data to a mobile phone lecturer.So, this system can mark class attendance and update quickly, print class attendance sheets if necessary, automatically generate report of class attendance, and the lecturer can see who attendance and who was not present at that time and many more function. So RFID can be use to implement this project. When student attend the class the RFID will detect student matrix card. After that, RFID will send data to the computer to be stored and it will send a notification to the mobile phone via Bluetooth.So student list of attendance will be received by lecturer through mobile phone at the meant time.This system proposes to be put in the class. Something like this happens when a student enters the class, & the mobile application helps in uploading the information data of that student.

C. Design of management software on PC-

Management software consists of communication interface DLL (Gong, 2004) and corresponding management setting program. Communication interface DLL charges the communication between wireless communication module and PC and management setting program is able to transmit data processing, information of stuff and shift managing, inquiry and print information of attendances.

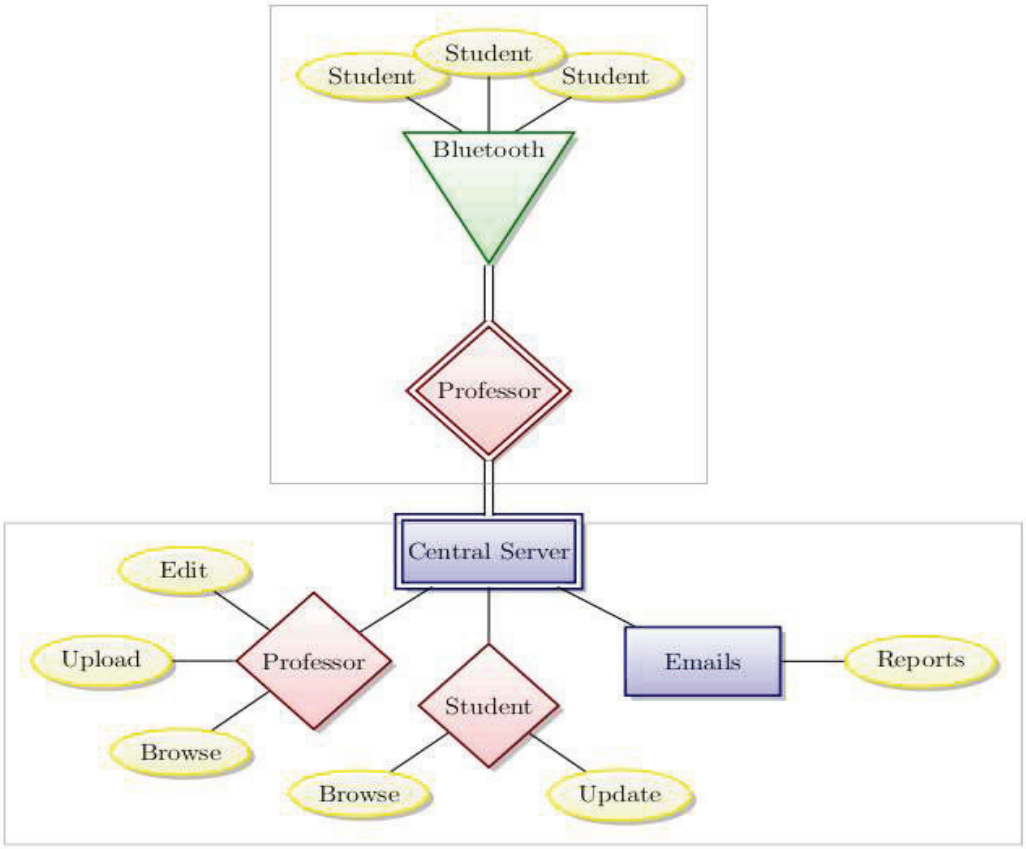


Figure 2.E-R Diagram.

D. Communication Architecture–

The system employs heterogeneous communication protocols in its operations. Within the internal structures of the system in which the implementation is hidden from the user, Transmission Control Protocol / Internet Protocol (TCP/IP) is used. This ensures that data transmitted within the system is reliably received.Communication between phones and the multi-threaded terminal is by Bluetooth. Between the tags and the phones, NFC is employed. The fingerprint reader is directly connected to the terminal through a Universal Serial Bus (USB) cable. The figure below illustrates communication architecture between the various components of the system.

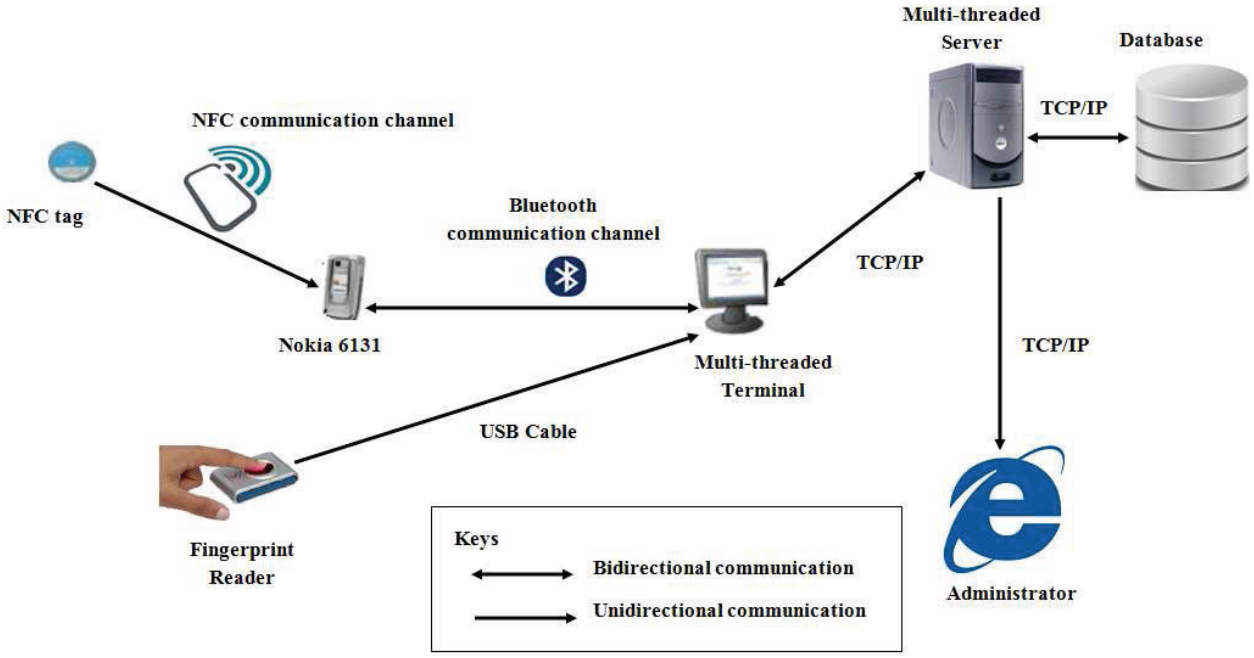


Figure3.Communication Architecture Of the System.

III. EXPERIMENT AND RESULT

A. Why To Use Bluetooth For This Approach–

While there are many other technologies like WIFI, AIRPORT, INFRARED, ZIGBEE and many more but the key among them are range, power consumption, and intended use.*Bluetooth* wireless technology in its most common implementations has a range of 30 feet(10m). This range, depending on the *Bluetooth* device class, can extend to 100 meters and has been shown, in some tests, to support an even greater range. *Bluetooth* technology consumes a low amount of power and is therefore appropriate for cell phone and battery-operated devices . The technology provides voice, data, and audio connections between devices.

B. Motivation–

Taking attendance in large classes is

- cumbersome
- repetitive
- Consumes important class time
- Universality of mobile phones motivates to make better use of this technology.

C. Merits–

- Detection of Remote Devices.
- Broadcast of "Obex Listener" for delivery of objects requests from remote devices.
- Receipt and storage of objects from remote devices.
- Data management of received files,extracting the student ID information.
- Comparison of arriving data with previous registration lists.
- Transmission of information to remote devices.
- Receipt of Registration.
- Error Detection.
- Confirmation of error rectification.
- Production of registration lists for Lecture.

D. Demerits–

- Proxy Attendance
- Persistent problem that needs to be addressed
- Need a robust solution

IV.CONCLUSION

We covered almost all the technologies in the Bluetooth attendance system and conclude that with the advancement of this technology and with the increasing demands of the people new procedures are been developed. It will be really beneficial for the students as well as the professors of the respective universities and colleges as with the advancement of this technology they can utilize their lectures in a best manner. Therefore, we can conclude that in future, we can consider Bluetooth attendance tech system as a good option in near future to meet the growing requirements of the generation in effective manner. The system is very easy to use. Users are directed as what step to take next by providing them withtimely information displayed on their phones. Accidental touching of tags which may result in an unnecessary trigger is avoided since users need to deliberately connect to the terminal via Bluetooth first before the tag application is activated.The system requires minimal initial calibration to initialize which tag is

used as Entry tag or Exit tag. The system is very useful in school environment, work places and any organization that requires strict authenticated and authorized users to be at the premises. Prediction of unacceptable user behavior is automatically sent to the administrator. This saves administrator's time from manually scrutinizing the system to make inferences from users' data.

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