Advanced College Surveillance System

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Abstract- Among the various technological devices and systems, GSM based tracking system will pass complete information about the student and there activities. The RFID system is utilized as a board module to attach the parts of the object say student (identity card, tag, etc.) and follow the object then and there. In this paper, a novel fingerprint reconstruction algorithm is used to automate the whole process of taking attendance for staff and lecturers, manually which is a laborious and troublesome work and waste a lot of time, with its managing and maintaining the records for a period of time is also a burdensome task. The designed model is studied under laboratory scale and the results are analysed.

Index Terms*- GSM, RFID, Renesascontroller, finger print reconstruction, Security, GSM modem.

I. INTRODUCTION

In recent year there is need for better way for maintaining student and staff database in institutions, to bring safe and secure campus for better learning environment. Campus as already taken smart steps such as planning, training staff and implementing technology and yet serious maintenance and security vulnerabilities persist.

In certain application such as various activities related to staff and student of the institution, during analysis, data collected on various files, decision points and transactions handled manually. It's time consuming and costly.

College should haven for education. New development in surveillance technology using controller based maintenance in college/ universities. Improves security as well as enhance operations and minimize time.
To overcome drawback of manual system we propose a new digitalized maintenance system.

II. LITERATURE SURVEY

In previous work [1], GSM and RFID based college maintenance system is used where RFID tag provided, when is read by reader, it compares the codes with predefined codes in the machine, based on correctness it sends an acknowledgement to the parents of that student and it also maintains a record of check in and check out timings of student, which can be further transferred to the administrator via network systems.
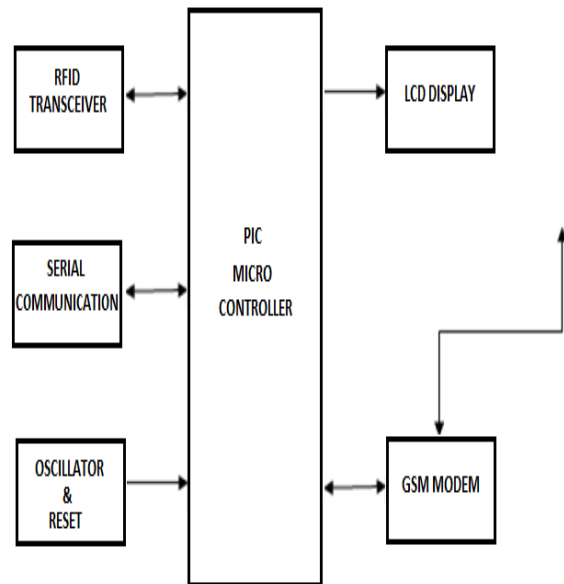

Fig1. Block diagram

In [2] a novel fingerprints reconstruction algorithm reconstructs the phase image from minutiae. The proposed reconstruction algorithm is used to automate the whole process of taking attendance for staff and lecturers, manually which is a laborious and troublesome work and waste a lot of time, with its managing and maintaining the records for a period of time is also a burdensome task**.**
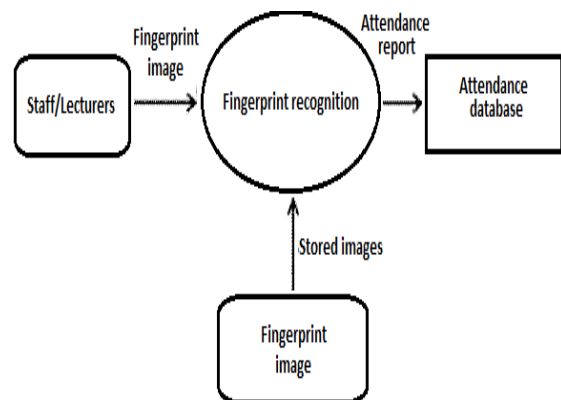

Fig2. Attendance management system

So current research which has been presented above is developed and additional enhancement is carried out in our approach, to overcome the limitation, to provide more efficient and reliable system we propose certain improvements by combining the above two functional blocks which yields more

stable, reliable and high performance system for college maintenance.

III. DESIGN AND CONSTRUCTION DETAILS OF PREVIOUS WORK

A. RFID

Many types of RFID exist, but at the highest-level, we can classify RFID devices into two classes namely, active and passive tags. Active tags require power source either connected to powered infrastructure or use energy stored in an integrated battery. In the laterals, tag's lifetime is limited by stored energy, balanced against the number of read operations.

Fig3. RFID reader and tag.

B. GSM System

The GSM system has been recognized as a successful cellular phone technology for diverse applications including the ability to roam worldwide with the certainty of being able to operate on GSM networks in exactly the same way. GSM achieved this by the digital TDMA (time division multiple access) approach. By adopting this technique, more users can be accommodated within the available bandwidth. In addition to this, ciphering of the digitally encoded speech is adopted to retain privacy. Using the earlier, it is possible for anyone with aid of scanner receiver to listen the calls and a number.

C. GSM Modem

A GSM modem is a wireless modem that works with a GSM wireless network. A wireless modem behaves like a dial-up modem. The main difference between them is that a dial-up modem sends and receives data through a fixed telephone line while a wireless modem sends and receives data through radio waves.

D. GSM network interface

The network structure is defined within the GSM standards. This facilitates the information interchanges can take place. It also enables to a large degree that network elements from different manufacturers can be used.

Although the interfaces for the GSM cellular system may not be as rigorously defined as many might like, they do at least provide a large element of the definition required, enabling the functionality of GSM network entities to be defined sufficiently.
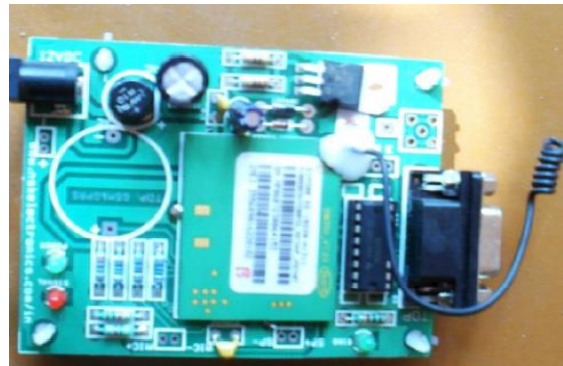
Fig4. GSM module

E. Alpha-numeric LCD display

A liquid crystal display is a thin, flat electronic visual display that uses the light modulating properties of liquid crystals (LCs). LCs does not emit light directly. In liquid crystal displays (LCDs) of liquid crystal technology is the most common applications. An advanced VGA computer screen from the pervasive wrist watch and pocket calculator, this type of display has evolved into an important and ambidextrous interface.
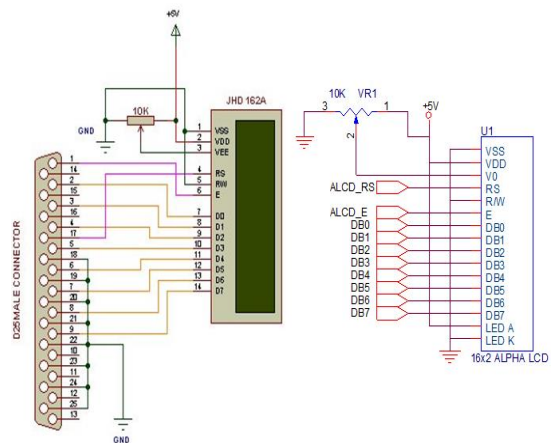
Fig5.ALCD architecture

F. PIC micro controller

PIC 16F77A PIC micro controller is used for this project. The PIC micro controller program reads the data of RFID. The micro controller programming is done using embedded C, a middle level language for control units. The PIC microcontroller 16F877A has an operating speed Max 20 MHZ, voltage (2-5.5v). Memory consists of flash program RAM, EEPROM and data memory. Displayed data of RFID are transferred into RS 232, which is interfaced with microcontroller through MAX232.
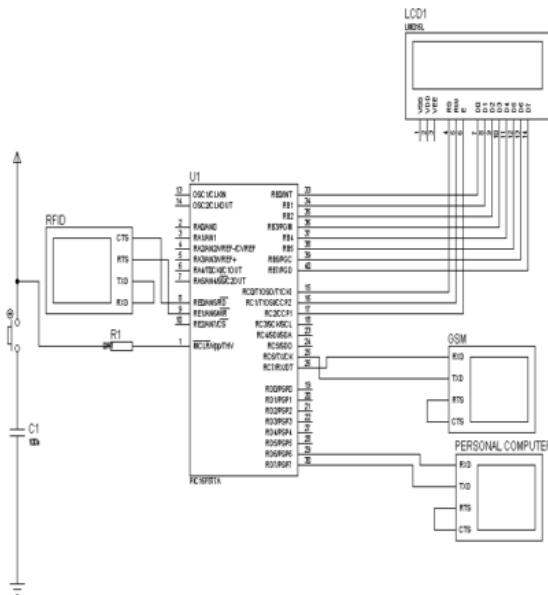
Fig6. Circuit diagram

IV. PROPOSED WORK

In our paper, we illustrate a compact system which can perform following functions

1. Biometric authorization (finger printing)
   - For staff/lecturers attendance validation, after verification controller sends remainder message about timetable of current day.
   - Certain rooms in colleges needs extra security, such rooms can be monitored automatically by allowing the persons (lab assistants attenders etc.) with limited access.

2. RFID

In institutions, students should be present for predefined hours.
   - Student's attendance is updated in the database and also informing about the Students check in and checkout timings for his/her parents through a message sent from the controller using GSM.
   - At the end of semester if any student has a shortage of attendance controller brings into notice of student's parents by sending a message, whose GSM mobile numbers are stored in database.
   - Due status of student
     - E-notice to students by keeping a remainder (beginning 3 to 4 days) half yearly or quarterly (say any month when college starts) by making use of his/her unique code (usn).
     - An atm deposit facility to pay fees as his/her dues are cleared, Hence after his/her deposit automatically e-receipt is generated for confirmation of payment

3. GSM

- If any student wishes to know his due details, instead of going to college, by using GSM SMS facility with his/her usn as code, controller verifies and replies to respective students.
- Instead of manual notice system, notices can be displayed using GSM on the display systems located in some remote area.

4. AUTOMATED PERIODIC BELL

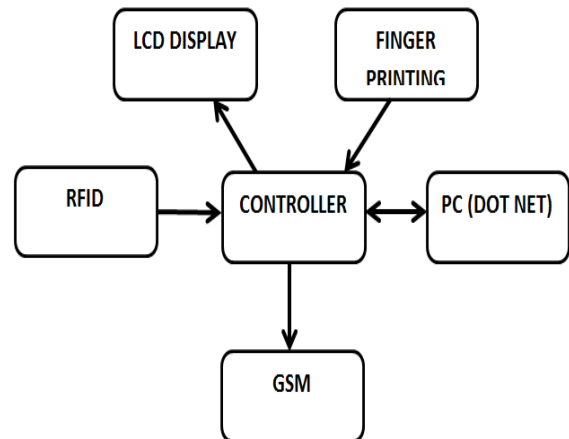To generate periodic alarms automatically according to the reprogrammed timings.

Fig6. Block diagram of proposed system

Fig7. Snap shot of proposed system

V. RESULT AND DISCUSSION

In our system we have combined RFID, fingerprint and GSM are connected with Renesas controller and varying data is sent to GSM modem which is displayed in LCD. Through this experiment and implementation, we came to know that, staff can be monitored using fingerprint module, students can be monitored using RFID and GSM module is used for transceiving SMS's for assigned function. Our system can be extended to monitor the objectives and also can be controlled the hijacking further consequences.

VI. ADVANTAGES AND DISADVANTAGES

> *Merits*

- Attendance is checked and validated automatically, so that paper usage is reduced.
- Conventional methods followed in institutions are time consuming and costly these can be overcome by adopting our proposed method.
- Manual periodic bell are replaced by system which generates periodic alarms automatically according to the reprogrammed timings.
- Conventional notice boards eradicated completely by smart board displays.

> *Demerits*

- Implementing new technology leads to more complexity and costly at initial stages.

VII. CONCLUSION

The efficient utilization of the RFID, fingerprint and GSM technology is successfully designed and implemented. The observations clearly showed that the accuracy and security level may be extended to the public level. Finally our system yields more reliable and faster processing as real time system

VIII. FUTURE WORK

Though there are more advantages in our system, but still there exist some limitations in our system.
In Finger print
- Require large processing power for image enhancement
- Require large memory capabilities for storage
In RFID
- Mis-usage of tag by students false/fake attendance

Every system has its own advantages and disadvantages, in eliminating these limitations we propose some enhancements.
Inspite of RFID and Fingerprint we can also make use of wireless Iris recognition system
But using iris system we identify certain limitations like

- Its costly at installation and maintenance
- Time consuming
- Not applicable to large community like institutions

Therefore to eliminate fake/false attendance of students in RFID tag we make use of object counter as shown[3].

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