

Improved Security in Smart College Management System controlled IoT Android Application

¹Dr. R. P. Meenaakshi Sundhari & ²K. Jaikumar

¹Professor - ECE Department, P.A College of Engineering and Technology, Pollachi

²Asst. Professor - ECE Department, P.A College of Engineering and Technology, Pollachi
rpmeenaakshi@gmail.com, jaikumarkarthi@gmail.com

Abstract—In this paper, we propose a design for smart management system using android application to manage college. It will have students' and faculty details in all aspects, the various academic notifications to the staff and students updated by the college administration. It also includes all official circulars which are to be circulated in the class rooms. Administrator will be given privileges to update the data or circular. Staffs and students logging in may access the system and know about the recent circulars and the data modified by the management. To overcome the drawback of browsing websites for long time for fetching information for short contents. This system ignores the requirement for maintaining the manual records and also requires very small amount of time in viewing the required information.

Index Terms—Eclipse, Android, Kepler, Tiva, Security

I. INTRODUCTION

In our day to day life we are highly dependent on android phone. Students are heavily dependent on web for their daily basis work over projects, downloading syllabus, attendance, availability of materials and databases. Hence, we are developing an android mobile application to overcome those delay process on websites. Now a day's system has a lot of procedure to be done to fetch information from the browser. It takes long time and it is too difficult to search a particular website for even brief contents. Hardly students have theories rather than practical so it is indeed to search on web for regular materials. This system as mentioned based on the android application so it can be viewed instantly by the students for their needs without any time delay and it make ease way to communicate between the authorities and other personals. The system uses authentication from the higher official or administrator to change the data or upload the academic circulars through the mobile application [1]. To improve the security for data and unnecessary chats here the administer has only given rights by the Tiva C Series microcontroller to modify or send the data.

In this paper we declared about the drawbacks on working with web pages and resolutions were specified

through working demonstration on applications [2]. When a student are faulty is need of searching any information on the website it may take long wait to get the result meanwhile you can use this system to find the appropriate section on the app as there were specific tags were added to guide the user towards their designated search which conserve much more time than the former process and this could make way to improved performance of the time elapsing work.

This provides notifications to the students through GSM module when any update has been done. This makes students aware about the updating as they can reach the app for further updated information from the higher authorities. The students can only view that information as no editing can occur as it is partially one-way communication. This could widely avoid the chance of being corrupted by fraud ant practices as it secured by the unique username and password individually. This system helps the management at high rate to reduce the manual work on maintaining the records as here it all shelter under one roof of application.

II. SYSTEM ARCHITECTURE

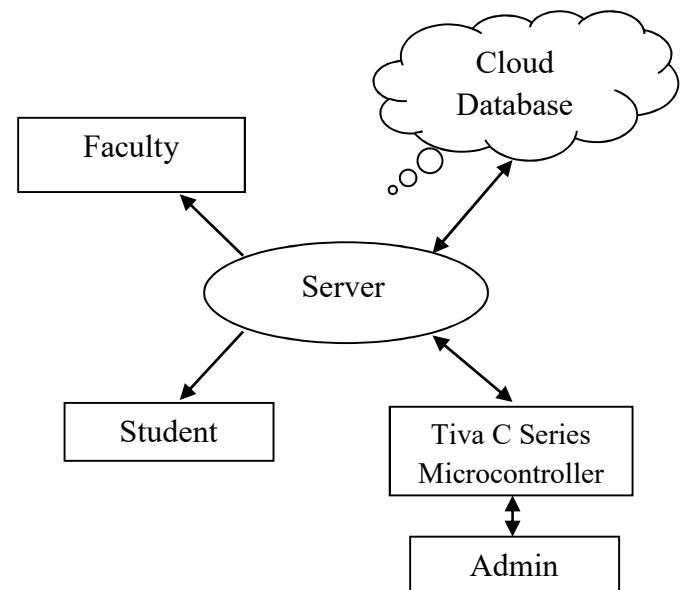


Fig.1 System Architecture

The system architecture is providing with a smart phone or tablet with an android OS. A web service will be provided in the case of online while updating it will be uploaded instantly to the application as in case of being offline it will alert the user by the offline notification regarding the update [3]. Admin is providing with flexible handling ability as they could edit and change the content which is to be shared among the receivers. Here the admins are higher authorities of the management who will be the transmitter and students will those receivers but they can only review the information and cannot edit things without the knowledge of those superiors. The pinned security measures include unique username and secured password immensely reduce the risk factors by reducing the chance of facing trouble caused due to fraudulent activities.

III. WORKING OF ANDROID APP

A. ADMIN

The application will enhance the performance by increasing the speed of the procedure and management process. Students and faculties will engage with large amount of work and perform effectively as the time required becomes decreased as working on the application. Admin used to update the information on the app. He/She will login into the account with their username and password provided through the microcontroller, after authentication process are performed, they enter into the account [4].

B. STUDENTS

Once information is updated on the application notification regarding the update will be sent to the students via GSM module from the hardware used Tiva C series. As it is a one-track communication student can view information and are denied to edit it.

C. NOTICE

In this module notification regarding the databases, results of the students are updated in the app by the authorities of management in a secured way without outdate.

D. SECURITY

As it becomes vulnerable when it comes to security era in most of the systems but here we used unique username and password to secure the accounts of students and the shared information.

IV. TIVA C SERIES MICROCONTROLLER

The TM4C123C3PM microcontroller is included in the system to provide security. Administrator is given authentication through the microcontroller [5]. Once the administrator gives the password it checks with the password which is saved in the microcontroller. Once the password matches Tiva Microcontroller gives the permission for administrator to upload or modify the data.

Features of Tiva C Series microcontroller are 32-bit ARM cortex-M4 80MHz processor core with system timer. Integrated nested vectored interrupt controller. Wake up interrupt controller with clock gating. Memory Protection Unit (MPU), Embedded trace macro and trace port system control block and thumb-2 Instruction set.

On chip memory featuring 32 KB single cycle flash up to 40MHz a pre fetch buffer improves performance above 40MHz, 12KB single cycle SRAM internal ROM loaded with Tiva Ware for C series software, 2KB EEPROM. One controller area networks (CAN) module using CAN protocol version 2.0 part and with bit rates up to 1 Mbps.

Advanced serial integration, featuring eight UART with IrDA, 9 bit and ISO7816 support: four synchronous serial interface Modules, supporting operation for free scale SPI, MICROWIRE or Texas instruments synchronous serial interfaces: six inter integrated circuit modules providing standard and fast transmission and support for sending and receiving data as either a master or a slave.

ARM prime cell 32-channel configurable micro direct memory access controller providing a way to offload data transfer tasks from the cortex M4 processor allowing for more efficient use of the processor and the available bus bandwidth Analog support featuring two 12 bits analog to digital convertor with 12 analog input channels and a sample rate of one million samples per second two analog comparators 16 digital comparators on chip voltage regulators.

Two ARM FIRM compliant watchdog timers six 32-bit general-purpose timers six wide 64-bit general-purpose timers 12 16/ 32 bit and 12 32/64-bit capture compare PWM(CCP) pins. Up to 49 GPIOs depending on configuration with programmable control for GPIO interrupts and pad configuration and highly flexible pin mixing.

Multiple clock sources for microcontrollers' system clock: Precision oscillator, main oscillator and internal 30KHzoscillator. Full featured debug solution with debug

access via serial wire interfaces and compliant test access port. Industrial range ROHS complaint 64 pin LQFP

V. ECLIPSE KEPLER

Eclipse is an integrated development environment used in computer programming and is the most widely used JAVA. It contains a base workspace and an extensible plug in system for customizing the environment [6].

Eclipse is written in C JAVA. It was manufactured by Mitsubishi eclipse, United States. Eclipse software development kit is free and open source software released under the terms of the eclipse Public License although it is incompatible with the GNU general public License. Eclipse is a free Java based development platform known for its plug ins that allow developers to develop and test code written in other programming languages. This platform can be used to develop client application, integrated development environment and other tools.

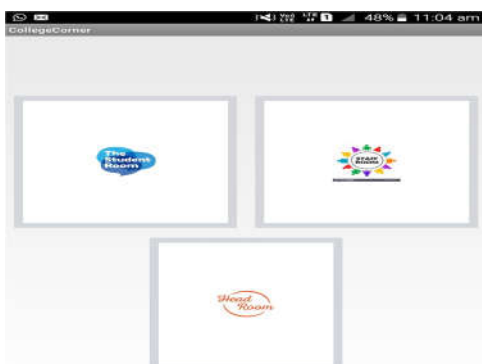
This actually has implemented its own compiler called as eclipse compiler for Java. It is different from Java C, the compiler that is shipped with Sun JDK. One notable difference is that the eclipse compiler lets you run code that didn't actually properly compile.

A. KEPLER

A Kepler model can be generated from Eclipse plug-ins. Equinox provisioning can also generate metadata for provisioning from Eclipse plug-ins.

Eclipse uses plug ins to provide all the functionalities within and on top of the run time system. Its run time system is based on an implementation of the core framework specification [7].

In addition to allowing the Eclipse Platform to extended using other programming languages such as C and Python the plug-in framework allows the eclipse platform to work with typesetting languages and networking applications such as telnet and



databases management systems. The plug-in architecture supports writing any desired extension to the environment, such as for configuration management [8]. Java and CVS support is provided in the eclipse SDK with support for other versions control systems provided by the third-party plug-ins.

VI. RESULT

Fig. 2 Android App Front Page

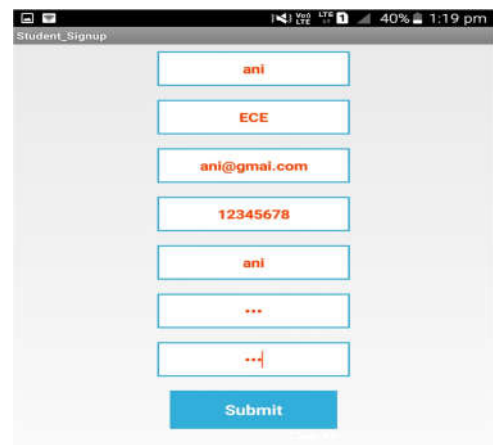


Fig. 3 Student Signup Page

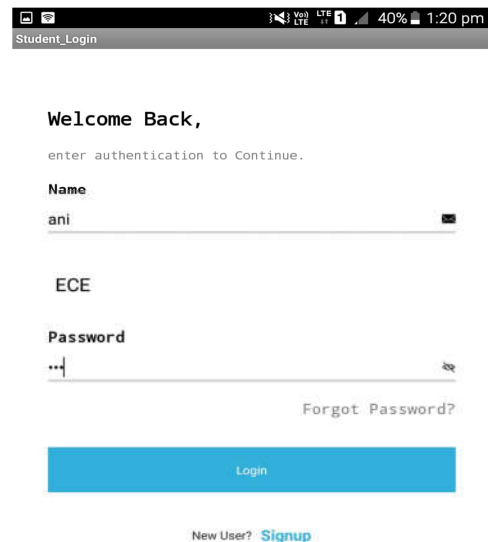


Fig. 4 Student Login Page

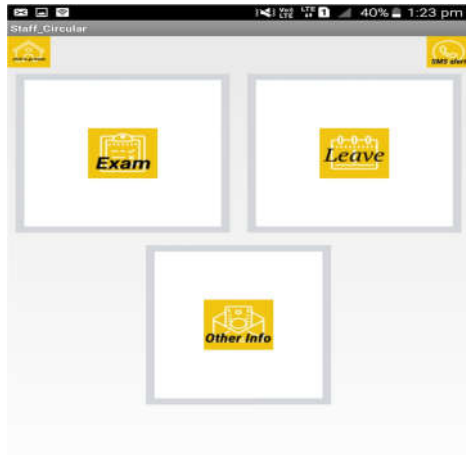


Fig. 5 Student Circular Page



Fig. 6 SMS Activity

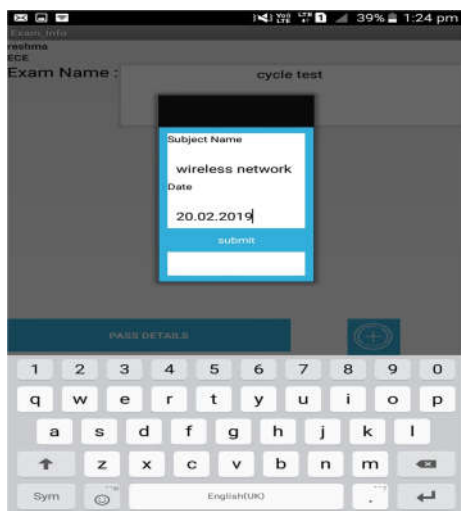


Fig. 7 Test Schedule Page

VII. CONCLUSION

College management system using android application was implemented with hardware Tiva C series and android application. The future updating will be creating maintaining databases which will contain the availability of faculties, materials in library, examination time table. So near in future we can get every miniature activities of the management up to date in our immovable place without missing any of the announcement. The authentications is also made more secured by using password and username which cannot be used for fraudulent purpose.

ACKNOWLEDGMENT

The authors thank the management and Principal of P.A College of Engineering and technology, Pollachi for providing excellent computing facilities and encouragement.

REFERENCES

- [1] S.A.Kalane, A.S.Jadhav, S.S.Kadam, Prof.S.B.Khedkar, Android Application for College Management System, International Journal of Computer Engineering and Applications, Volume XI, Issue XII, Dec. 17, ISSN 2321-3469
- [2] Barcelo, M., Correa, A., Llorca, J., Tulino, A.M., Viccaro, J.L., &Morell, A.: IoT-Cloud Service Optimization in Next Generation Smart Environments. IEEE Journal on Selected Areas in Communication, Vol34, 4077 — 4090 (2016)
- [3] K.Jaikumar, M.Santhosh Kumar, S.Rajkumar and A.Sakthivel, Fingerprint Based Student Attendance System WithSmsAlert To Parents, Fingerprint Based Student Attendance System With SMS Alert To Parents,” in IJRET: International Journal of Research in Engineering and Technology, Volume: 04 Issue: 02, Feb-2015.
- [4] Lalit Mohan Joshi, A Research Paper on College Management System, International Journal of Computer Applications Volume 122 – No.11, July 2015, (0975 – 8887).

[5] Singh, A., &Chatterjee,K.: Cloud security issues and challenges survey. Journal of Network and Computer Application, 78, 88—115(2016).

[6] Gubbi, J., Buyya, R., Marusic, S., &Palaniswami, M.: Internet of Things IoT): A vision, architectural elements and future directions. Future Generation Computer Systems, Vol 29, Issue 7, Sep 2013, ISSN - 1645-1660

[7] Miorandi, D., Sicari, S., DE Pellegrini, F., &Chlamatac, I.: Internet of Things: Vision, application and research challenges.D HOC NETW.10 , 1497—1516(2012)

[8] Atzori,L., Iera, A., &Morabito, G.: The Internet of Things: A survey. Computer Networking. 54, 2787—2805(2010)