

College Management System

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Abstract:

These days Smartphones play a major role and have become a powerful piece of everybody's life. The core of these advanced mobile phones is their Applications. The College Management System is an application which permits us to get data about the staff, College news, bus-transport (GPS service), smart billing in food court and offices. You can access any information related to college in a single click.

Keywords — Raspberry pi, Android, GPS, RFID.

I. INTRODUCTION

The design and implementation of College Management System (ColMag) and user interaction is to replace the current method. College Staff are able to directly access all aspects of a student academic performance through a ColMag application.

The college magazines, journals, and news can be posted on the application hence it can reach faster compared to circulars. The industry meets video is available on the application ^[6], so students can easily watch the video at any time. The different circulars can be forwarded. The important event schedule can be notified to the students and reminder is sent. Overall, this application made communication process and institutional activities.

A vehicle (College bus) tracking system can be done by GPS. Due to traffic and road works, most of the buses are delayed ^[3]. People have to wait for their bus at the bus stops for a long time without even knowing when the bus will arrive. The main focus of the project is to save the waiting time of students and provide live location of their bus and this application

sends notification when the bus is 200 meters near to the person.

ColMag help reduce the service time in food court, eliminates queues in billing section, it provides a way of storing records and keeping the money safe as mostly the payments are made online via virtual money, it is benefit for the canteen owner. We achieve this process by using Radio Frequency Identification (RFID) card ^[8]. When the person orders food through a ColMag application, the cart item is sent to the local server, and the bill will be in the queue.

An RFID card reader 1 is placed in front of food court, when the person scans the card bill in the queue goes to display depending upon the entry of the person (first in-first get) in the food court.

An RFID card reader 2 is placed under the display when the person scans the card. The owner of the bill is identified and gets an ordered food.

II. HARDWARE COMPONENTS

It includes all physical parts of the project, which are integrated with software systems.

- Raspberry pi
- RFID reader
- Tablet/Smartphone/Laptop
- GPS module
- Arduino Leonardo

A. Raspberry pi

Raspberry Pi is a low cost, onboard computer where we can perform all micro tasks. It has been used for lots of digital projects.



Fig. 1 Raspberry pi

B. RFID reader

A Radio Frequency Identification Reader (RFID reader) is a scanner used to get data or information from an RFID tag through radio waves.

The RFID tag must be in range of 3 to 300 feet depending upon reader device in order to read even if it is surrounded by other items.

RFID tag has at least an IC in it for modulating and demodulating radio frequency and an antenna for sending/receiving signals



Fig. 2 RFID reader

C. Smartphone/Tablet/Laptop

Smartphones, Tablet and Laptop are convenient devices and have internet connections but carry

distinct features. These gadgets are becoming much more dominant and are coming extremely close to the laptops

D. GPS module

GPS receivers actually work by finding out how far they are from a number of satellites.

The satellites transmit data about their position and current time in the form of radio signals. Then GPS receiver calculates how far away each satellite and how long it took for the signals to receive [2]. Once it has information from atleast three satellites, it can point out your location on Earth.

It has Power Save Mode which reduces power consumption to just 11mA by selectively switching parts of the receiver making it suitable for power responsive applications like GPS wristwatch [7]. It has Universal Asynchronous Receiver / Transmitter (UART) to communicate at baud rate between 4800 - 230400bps with default as 9600.

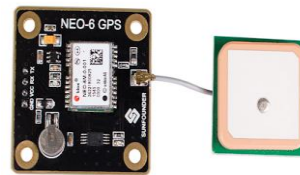


Fig. 3 NEO-6 GPS module

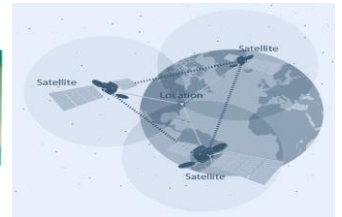


Fig. 4 GPS satellite pointing a position

E. Arduino Leonardo

Arduino is an open-source electronic platform-based board. Arduino boards are able to read inputs from different sensors and generate digital output. You can define set of instructions to control the microcontroller in this board through Arduino Software (IDE).



Fig. 5 Arduino Leonardo

III. SOFTWARE COMPONENTS

- Android studio
- Eclipse IDE

A. Android studio

Android Studio is the authorized integrated development environment (IDE) for android application development. It is based on the Java integrated development environment for software, and incorporates its code editing and developer tools. To support application development within the Android operating system, Android Studio uses a Gradle-based build system, emulator and GitHub integration. Every project in Android Studio has one or more techniques with source code and resource files^[1]. This technique includes Android application modules, Library modules and Google Application Engine modules.

Android Studio has integrated Version Control plugins. A code editor helps developer to write code and offer code completion, refraction, and analysis. Applications built in android Studio are then compiled into the APK format to upload in Google Play Store.

B. Eclipse IDE

Eclipse is an integrated development environment (IDE) for developing various applications using Java programming language and other programming languages such as c, C++, Python, PERL and Ruby etc.

The eclipse platform which provides the base for the Eclipse IDE is composed of plug-ins and it is designed to be extensible using extra plug-ins. The eclipse platform can be used to develop rich web applications, client applications, integrated development environments and other tools. Eclipse can be used as an IDE for any programming language in which a plug-in is available.

This is useful if you like to have autocomplete and syntax highlighting when you are editing or reading JavaScript code. To work on projects that have HTML, CSS and JavaScript we need to install Eclipse Web Tools Platform (WTP).

IV. PROPOSED SOLUTION

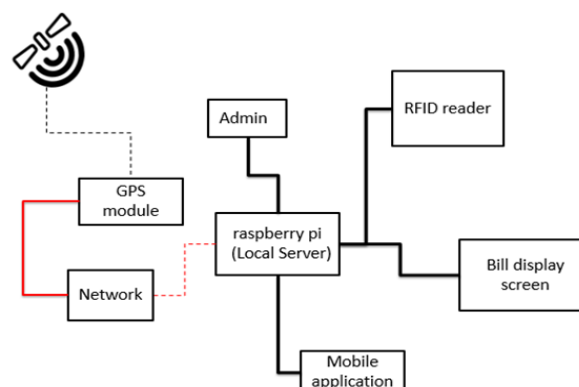


Fig. 6 Block diagram

In the RFID system the information is contained by the transponder Tags. This information can be as a single binary bit, or be a large array of bits representing things as an identity code, personal medical information, or any type of information can be stored in digital binary format. The Tags are two types: Active Tags and Passive Tags. Active tags have their own power source whereas Passive tags have no power source of their own and instead it takes power from the incident electromagnetic field. In this we use passive tags. The heart of a tag is a microchip. To access the internal memory and transmit stored information tag is able to draw enough power from the field it enters the generated RF field. When the transponder Tag draws power, the resulting interaction of the RF fields causes voltage drop in at the transceiver antenna. Tag uses this effect to communicate information to the reader. The amount of power taken from the field can be controlled by Tag, so the voltage sensed at the transceiver can be modulated according to the bit pattern it wishes to transmit.

It communicates with the tags through a Radio Frequency (RF) channel to acquire information. Depending on the type of tag, this communication may be unpretentious or maybe more composite. In surroundings with many tags, a reader may have to

perform an anti-collision protocol to ensure that communication disagreement doesn't happen.

A passive tag that does not contain a battery, the power is taken by the reader. When radio waves from the reader are met by a passive RFID tag^[5], the coiled antenna within the tag forms a magnetic field. The tag draws power from it, activating the circuits in the tag.

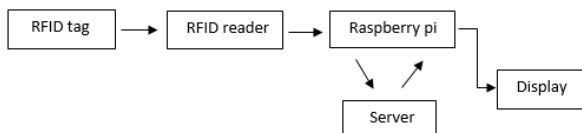


Fig. 7 RFID workflow

Users can apply through this page for their various certificates, concession forms etc. in the prescribed format of the institute. Once the e-application is submitted a notification is triggered to the concerned person and to the user confirming the submission. Once the approving authority approves the application a return notification is triggered to the user indicating the approval. The approval authority can use the back-end section from his mobile or his desktop.

Events can be maintained and informed to the users for all potential activities in this module. Events can be set for with time bounds, which will run out after the event is completed. Any events that can be maintained along with images, pictures and a variety of formats of documents. Event notification is triggered at every point. Images, write ups etc. can be attached for such achievements and a general broadcast can be sent to all the users. The users of this module need to log in with their exclusive ID provided by the college management. They can get access to the details of all the buses of college throughout their phones. Here they will get all bus and driver associated information offline too.

Students can find the location of their bus from anywhere. Students and staff must make sure that their location service is lively^{[3][4]}. They can also get

the estimated time of arrival of the bus at their individual stops. This will help them to direct their time and arrive at their stop at the proper time, not too early nor late.

V. CONCLUSIONS

ColMag application offers reliability, saves time and is user friendly. It can be used as a base for creating and enhancing applications for viewing results, smart billing system for food court, tracking buses for colleges. Students and their parents will also view results, presence and curriculum details using this application. Students can view details, notification anyplace and anytime. The application will greatly make things easier and speed up the result research and management process. It provides high safety and a system that reduces the work and assets required in the usual process. The proposed system provides the new mode of computing and displays an operation with responsive and beautiful user interface.

REFERENCES

- [1] Lizeth Ghandi, Catarina Silva, Tatiana Gualotuna "Mobile application development process – a practical experience" Information Systems and Technologies (CISTI), 2017 12th Iberian Conference.
- [2] Sandeep Kumar, Mohammed Abdul Qadeer, Archana Gupta, "Location Based Services using Android", IEEE- 2009.
- [3] Dr.(Mrs.) Saylee Gharge, Manal Chhaya, Gaurav Chheda, Jitesh Deshpande, Niket Gajra, "Real Time Bus Monitoring System Using GPS" Engineering Science and Technology: An International Journal (ESTIJ), ISSN: 2250-3498, Volume 2, Number 3, June 2012.
- [4] SeokJu Lee, Girma Tewelde, Jaerock Kwon, "Design and Implementation of Vehicle Tracking System Using GPS/GSM/GPRS Technology and Smart Phone Application" IEEE World Forum of Internet of Things(WF-IoT), March 2014.
- [5] S SumitaNainan1, Romin Parekh, Tanvi Shah - RFID Technology Based Attendance Management System from NMIMS University Mumbai, Maharashtra.
- [6] K. Vivek Thangam, T. Shyam Kumar, V. Yogesh kumar and S.Prabhu, "Android Application For College Management System (M-Insproplus)", International Journal of Modern Trends in Engineering and Research (IJMTER), Volume 04, Issue 2, [February– 2017] ISSN (Online):2349-9745; ISSN (Print):2393-8161.
- [7] S. Priya , B. Prabhavathi, P. Shanmuga Priya , B. Shanthini, "An Android Application for Tracking College Bus Using Google Map" International Journal of Computer Science and Engineering Communications, ISSN: 2347-8586, Vol.3, Issue 3, 2015, Page.1057-1061.
- [8] Shraddha G. Malviya, Nikita D. Deshpande, Shivani G. Mahalle, Prof. SharvariTantarpale Department of Electronics & Telecommunication Engineering, P.R.M.I.T&R, Badnera, "A Review Paper on Smart Restaurant Ordering System.", International Journal of Scientific & Engineering Research, Volume 7, Issue 2, February-2016, ISSN 2229-5518.