Cashless Campus: Fund Management Using Micropayment Technique

Neha Yadav, Udyam Sawant, Yogita Katkar
Smt. Indira Gandhi, College of Engineering
Navi Mumbai (400709)

Abstract - An innovative way to handle funds at college. Having a single multifunction campus card offering cashless catering, transport and other services looks great to students. The main objective of this system is to make all the transaction in a campus without liquid cash. Here we are trying to implement a cashless campus using Barcode technology. That means students do not need to keep cash to purchase anything inside the campus, they just need to scan the card given to them. The transactions made by the users are updated in the databases and monthly statements about the transactions is provided.

Keywords: QR Code Image Generation, QR Code Image Detection, Micropayment, Google Cloud Messaging , Decoding.

I. INTRODUCTION

This project is developed to ease the work of students. The project involves a card which contains a barcode which is nothing but a unique card that is assigned to the student. This card can be refilled as and when required by the student with the help of admin. This card is useful for the student in places like library , canteen , stationary shops and transport. When the card is inserted unique id is scanned and accordingly cash is deducted from the students account . This is done by scanning the unique id stored in the card which is sent to the server where the students document is stored and is directly sent from server wherever needed. Thus, the user doesn't have to carry this document always. The student can use this card in library to pay fine and amount of fine will be calculated depending on the information stored which is retrieved with the help of an id stored in the card . Same way in case of stationary shop where the cash amount is deducted from the students account and same way in case of canteen and transport. Thus the student just need to carry the portable card. Thus this card is very beneficial for a student and makes many of its work easy.

II. PROBLEM STATEMENT

Today, people getting busy and tension when facing their daily work, further more when they are required to queue up so long just to pay bills by cash. Although cash payment have been successful but it is not perfect solution because there is a risk of theft etc. Especially in this IT world, every industries and every single work has been computerized to improve the services and productivity. The information about the payment is not maintained properly or maintained in paper work so there is a risk of fraud or loss of data.

Today, student getting busy when facing their daily work, further more when they are required to queue up so long just to order a food in the food court. Although the food ordering system in most of the food court was successfully improve the food ordering process, but this should not mean it is the most efficient way of solution. Especially in this IT world, every industries and every single work has that offers in the food court was not stated clearly in the menu. Other than that, the food court does not update their menu from time to time.

Proposed System:

The proposed system is interactive, highly user friendly. Here we are going to implement a 'Cashless Campus' using QR code technology. The user has to scan the QR code to proceed to payment. If the QR code is valid. The purchase amount will be debited from their account .i.e., The system is used to make all the transactions inside the campus without liquid cash.in this system helps the user to carry many operations very easily the user can issue/submit book by scanning the QR code and if the person is submitting late then he will pay the fine by scanning the QR code and the amount will be deducted from his/her account and the user can even place food order and pay bill by scanning the QR code and the amount will be deducted from his/her account and while travelling the user can select the source and destination and pay the fare by same method and he/she can see the bank details by scanning the QR code.

Advantages:

1. Modern technique for food ordering system.
2. Time consuming: User will not have to go for order the food so it will reduces the user time.
3. Reduce lots of paper work: In our system the all order will be given through app, so there will be no any paper work for food ordering.
4. User-friendly application:-canteen management systems provides user friendly booth for users for choosing the food things and provides simple direct printing of coupons, the canteen management computer code helps the vendors to keep up a sleek flow of operations

5. Automated Canteen Vender Management:-Smart I's machine-driven Canteen management computer code helps the organization to keep up correct accounts moreover as keeps transparency with the seller.
6. User outlined Rules & Regulations:-Restriction may be set in line with time interval for the item's accessibility and Special rules also can be integrated inside system. E.g. Coupon isn't applicable for same day with same shift time.
7. Configured Menu Items:-The new menu things may be created daily or on fortnightly basis by the bank canteen manager; good I's canteen management system additionally provides with facility to tack together the provision of unlimited things throughout the day/night.
8. Bill Generation: -Maintain and Generate bill report of individual user.
9. Easy to issue and return book in library.

III. PROPOSED SYSTEM WORKFLOW

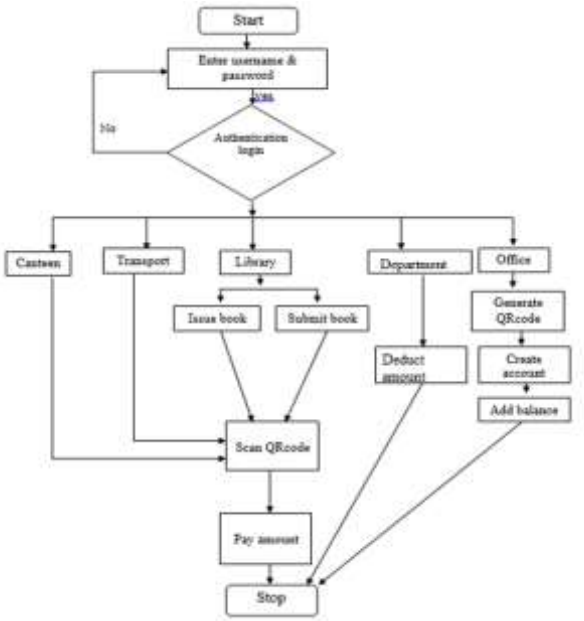

Fig. Basic workflow

A barcode is a machine-readable optical label that contains information about the item to which it is attached. A QR code uses four standardized encoding modes (numeric, alphanumeric, byte/binary, and kanji) to efficiently store data; extensions may also be used.

IV. CONCEPTS USED

Google Cloud messaging:

Google Cloud Messaging (commonly referred to as GCM) is a mobile service developed by Google that enables third-party application developers to send notification data or information from developer-run servers to applications that target the Google Android Operating System, as well as applications or extensions developed for the Google Chrome internet browser. It is available to developers free of charge. The GCM Service was first announced in June 2012as a successor to Google's now-defunct Android Cloud to Device Messaging (C2DM) service, citing improvements to authentication and delivery, new API endpoints and messaging parameters, and the removal of limitations on API send-rates and message sizes.

Google Cloud Messaging functions using server APIs and SDKs, both maintained by Google. The GCM has the ability to send push notifications, deep-linking commands, and application data. Larger messages can be sent with up to 4 KB of payload data.

Upon allowing the application permission to receive and display notifications, the client application sends a registration API request to the Google Cloud Messaging interface to begin the registration process. The GCM Service receives and acknowledges the request and responds by giving the device a GCM Registration ID, a unique identifier that the developer later uses to send a notification to the individual device. The identifier is stored onto the device, and is typically sent to the developer's application server to be stored. The GCM Registration ID is a randomly-generated identifier that does not contain any personal or device information that could allow a developer to discover the personal identity of the user. When the developer wishes to send a notification event to a device, the process begins with an API POST request being sent to the GCM Authentication Service. The POST request includes the GCM Registration ID, priority, optional values and links, and the information that is to be displayed on the device upon its arrival. Upon successful verification of the GCM Registration ID and other credentials, an authentication token is returned. Both identifiers are then sent to the GCM Service to be enquired and delivered to the device.
Register with Google Cloud Messaging from GOOGLE API Console and get Sender ID and API key for Google Cloud Messaging. Create server side code to save Google Cloud Messaging registration id in our database and send push notification to device.

Open the Google APIs Console page. https://code.google.com/apis/console/#project:46993948
Click on API Access and note down the API Key. API key will be used when send push notification requests from our server to GCM server. GOOGLE_SERVER_KEY= "AIzaSyC3Tbtm0b4RE2n-DCOT7zY5vdkowakzbvU";

QR Code:

QR code (abbreviated from Quick Response Code) is the trademark for a type of matrix barcode (or two-dimensional barcode). A barcode is a machine-readable optical label that contains information about the item to which it is attached. A QR code uses four standardized encoding modes (numeric, alphanumeric, byte/binary, and kanji) to efficiently store data; extensions may also be used. The QR code system became popular outside the automotive industry due to its fast readability and greater storage capacity. A QR code consists of black squares arranged in a square grid on a white background, which can be read by an imaging device such as a camera, and processed using Reed–Solomon error correction until the image can be appropriately interpreted. The required data are then extracted from patterns that are present in both horizontal and vertical components of the image.

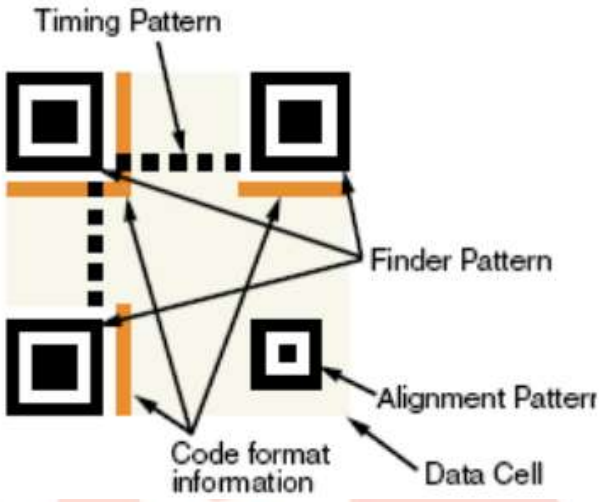

Fig . QR Code Structure

Micropayments
Micropayments refer to low value financial transaction ranging from several pennies to a few dollars. At present, a large portion of electronic commerce occurring in the mobile data network belong to the category of micropayments, such as
ringing tone download, news subscription, etc. Although the amount of each single transaction in micropayments is small, the number of users and transactions is large.

Way2sms
Way2sms is only a virtual Venue, which facilitates users to send SMSes. The services offered under **way2sms.com** is powered by Way2online Interactive India Pvt. Ltd. way2sms is just a DOT COM which promotes Way2online Interactive India wireless products and services. Way2sms.com is not an advertisement media site. It is important to realize that we offer free SMS service to registeRed users so that they communicate information to their known persons. (Communication should be between two known persons). The Site acts as a venue, which allows registeRed users to communicate information anything, which is legal, at any time, from anywhere, within India. Way2online Interactive India has no obligation to observe and monitor the service. However, we reserves the right to review materials posted and to remove any material/s.

Database connectivity:

MySQL is well known as world's most widely used open-source database (back-end). It is most supportive database for PHP as PHP-MySQL is most frequently used open-source scripting database pair. The user-interface which WAMP, LAMP and XAMPP servers provide for MySQL is easiest and reduces our work to a large extent.

String db="cashlesscampus";
Connectioncon=null;
String url = "jdbc:mysql://localhost/"+db; Class.forName("com.mysql.jdbc.Driver").newInstance();
con=DriverManager.getConnection(url, username, password);

V. RESULT

The actual transaction from canteen application is done after qr code scanning.

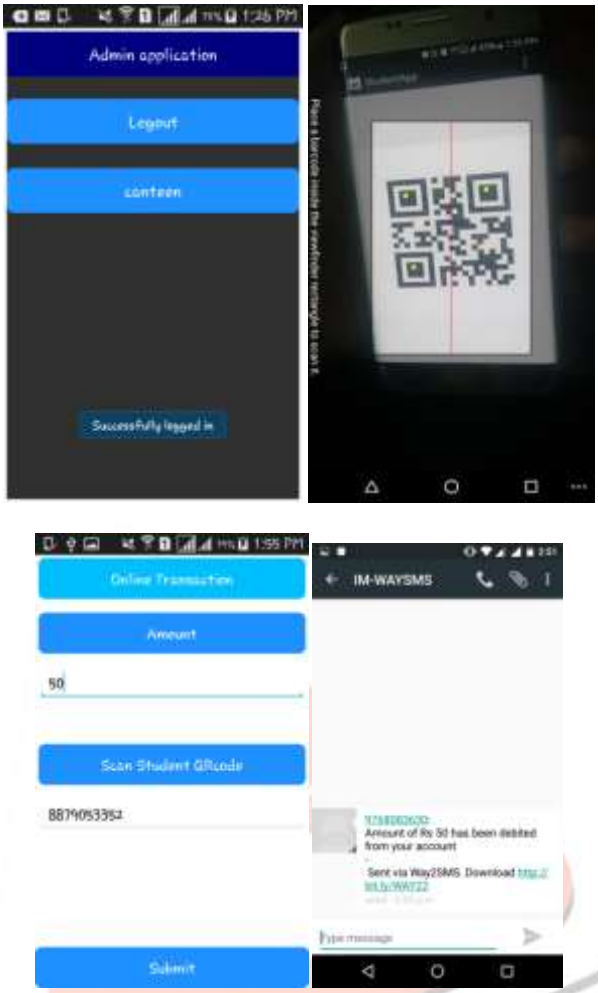

Fig. Result of QR Code scanning and Way2sms Transaction Details.

VI.CONCLUSION

Thus, we can conclude that the project aims at developing a quality focused system for the college to make it easy for students to buy stuff. Financial services to put the students at ease as generation is transiting for the paper methods to the digital world this concept will take the normal system to digital system which is more productive , fast and in accurate way.

VII.REFERENCES

[1]http://computer.howstuffworks.com/fingerprint-scanner.html
[2]https://www.sparkfun.com/products/11677
[3]http://searchsecurity.techtarget.com/tip/Biometric-authentication-know-how-Devices-systems-and-implementation
[4]http://extremeelectronics.co.in/avr-tutorials/sending-an-recei ving-sms-using-sim300-gsm-module/
[5]http://www.wago.com/wagoweb/documentation/app_note/a 1119/a111900e.pdf
[6] ttp://www.insidesecure.com/Company/Press-releases/POW ER-CASHLESS-PAYMENTS-AT-INTERNATIONAL-SCHOOL-OF-BANGKOK
[7]http://www.simcom.us/act_admin/supportfile/SIM900_ATC_V1.00.pdf
[8]http://www.henningkarlsen.com/electronics/library.php?id=52.
[9]http://henningkarlsen.com/electronics/library.php?id=55
[10]https://github.com/adafruit/Adafruit-Fingerprint-Sensor-Library
[11]IEEE paper on “A 2D Barcode-Based Mobile Payment System”.
[12]IEEE paper on “ICT and RFID in Education: Some Practical Aspects in Campus Life”.
[13]IEEE paper on “Barcode Readers using the Camera Device in Mobile Phones”
[14] Project Management a reference and overview.
[15]The book: Be Fast or Be Gone: Racing the critical chain project management, by Andreas Scherer.
[15]Software Engineering: A Practitioner’s Approach, book by Roger S. Pressman.