Noteless Transaction using RFID

A. V. Ramana[1] M. Satya Srikanth[2] K. ShivaHarsha[3]
[1]Assistant Professor [2,3]Student
[1]Department of Information Technology [2,3]Department of Computer Science & Engineering
[1,2,3]GMRIT, Rajam, India

Abstract— This paper provides a survey on radio frequency identification (RFID) technology. Initially RFID tags were developed to eventually replace barcodes in supply chains. The retrieval of a serial number does not provide much information to the user but it helps to keep track of items in a production chain. The real power of RFID comes in combination with a backend that stores additional information such as descriptions for products and where & when a certain tag was scanned. The advantages are that they can be read wirelessly without line of sight, contain more information than barcodes and more robust. This paper describes the current technology i.e., Noteless Transaction. The efficiency of this system can be observed in real time application and provides transparency in transaction. This system will have the required databases for student and faculty directory that shows unique id and transaction details. This application has been developed using PHP for scripting and MySQL for creating the database. Since the uses for RFID tags are so widespread, there is a large interest in lowering the costs for producing them. It turns out that printing tags might become a viable alternative to traditional production. The paper reviews the current progress.

Key words: Radio Frequency Identification, RFID Tags, Transaction, Database

I. INTRODUCTION

Now a day's Due to Demonetization people has been facing many problems. There were huge crowds outside ATMs across the country as people lined up to withdraw currency of smaller denominations. With limited cash in hand and an indefinite crunch in sight, most people are rushing to cashless transactions. "Digital transactions bring in better transparency, scalability and accountability. The new move will compel more merchants to accept digital money," So as to overcome the demonetization, we are going to introduce a Note less Transactions using RFID. There are many different RFID modules available in the market. The RFID module, which I am going use in this project, is RFID-RC522. It is quite easy to interface with Arduino Uno. RFID tags, or simply "tags", are small transponders that respond to queries from a reader by wirelessly transmitting a serial number or similar identifier. They are heavily used to track items in production environments and to label items in supermarkets. They are usually thought of as an advanced barcode. However, their possible area of use is much larger. RFID tags are expected to proliferate into the billions over the next few years and yet, they are simply treated the same way as barcodes without considering the impact that advanced technology has on privacy. This paper presents possible exploits of RFID systems and some proposed solutions as well.

II. WORKING PRINCIPLE OF RFID

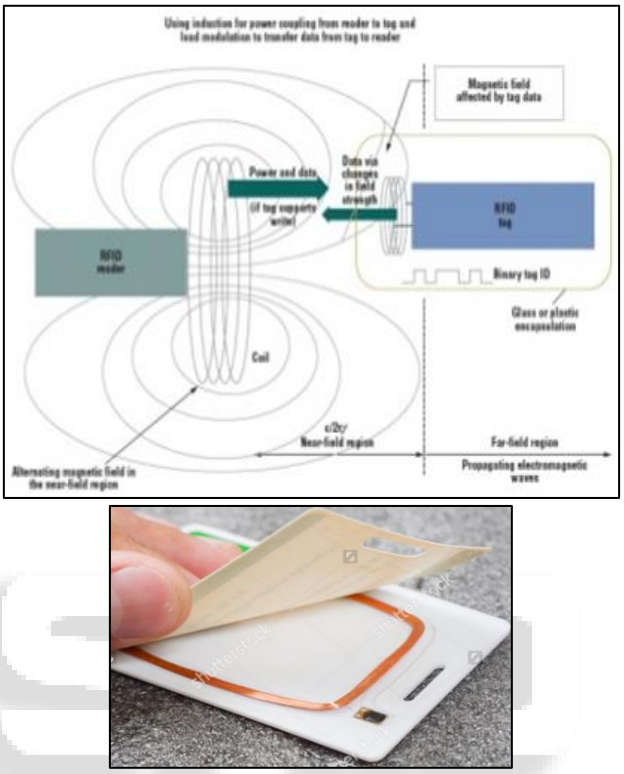

Fig. 1: Working Principle of Rfid

RFID signifies to tiny electronic gadgets that comprise of a small chip and an antenna. This small chip is competent of accumulating approximately 2000 bytes of data or information. An RFID reader and an RFID tag, both have a coil surrounding them. When an RFID tag is shown near an RFID Reader, it collects the unique tag data (a combination of digits and characters) from the RFID tag. You will be wondering how the chip inside RFID tag gets power? This is made possible via Electromagnetic Induction. I told you, both RFID reader and RFID tag comes with a coil in them. We power the RFID reader from power supply for reading purpose. Now when an RFID tag is shown near the reader, electromagnetic induction will take place between the coils and this power's the chip inside tag. This chip will send data electromagnetically to the reader. The reader will receive this electromagnetically transferred data and outputs it serially. Every RFID reader comes with Serial output pins. We can collect the read data through these serial pins using arduino or any other micro controller.

III. RFID INTERFACING WITH ARDUINO

Power supply requirement of RFID Readers vary from product to product. The RFID reader I used in this is a 5 Volts one. There are 5 Volts and 9 Volts versions available in the market.

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You may ensure the RFID Reader and RFID Tags are frequency compatible. Generally they are supposed to be 125Khz. You may ensure this before purchasing them.

There are two possible outputs from an RFID Reader. One is RS232 compatible output and other one is TTL compatible output.

A TTL compatible output pin can be connected directly to Arduino. Whereas an RS232 compatible output must be converted to TTL using an RS232 to TTL converter (You can design this yourself using MA)

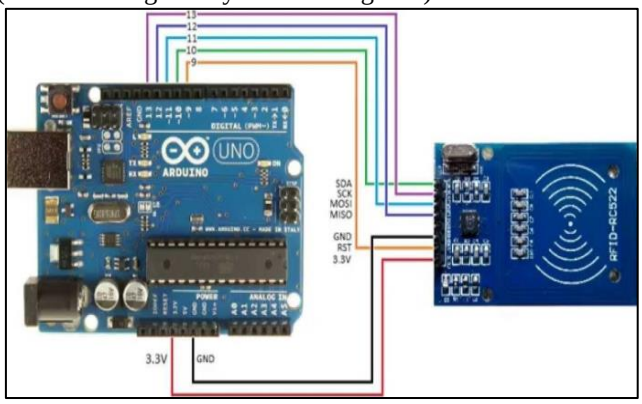

Fig. 2: RFID Interfacing with Arduino

A. Circuit connections of RFID-RC522 with Arduino

Make connections as shown. Make sure you connect Ground Pin of RFID reader to Ground Pin of Arduino. I am using the Software Serial Library of Arduino which enables digital pins to be used in serial communication. I have used pin 9 as the Rx of Arduino. (You can also use the hardware Rx pin of Arduino uno – that's pin 0).

IV. DATABASE CONNECTIVITY AND VIEWING TRANSACTION

Fig. 3: Database Connectivity and Viewing Transaction

Every Tag has its unique UID. In this process, every Tag should be register with their UID's for the Authentication. When the tag shown at Reader, if the card is authorized user, then it displays as "Your card is accessed", else it displays as "Access denied". In order to keep record of these transactions we decided to use an SD card for the offline version of the device and also stores some data in WAMP server, as this is an advanced version of apache tomcat server i.e. our own servers hosted on the campus Intranet, which could be accessed via Ethernet ports. This also required setting up some PHP scripts to store the details and to later make them available for viewing. To update the databases stored on servers, we have used the official Arduino Ethernet Shield, which also housed a slot for a micro SD card. The shield takes data from the Arduino and then sends HTTP requests over Ethernet to out server in order to update the Databases. An LCD Display is also placed to view the list of items available in canteen or in mess, and it is also used to view the Authorization.

We also made a website which can access the database and allow each and every person to check the transactions for their running accounts by entering their unique ID numbers.

V. PAYMENT PROCEDURE

The main objective of proposed system is to provide a technology oriented, low-cost, easily scalable RFID system for billing. This project is designed to use the security system application in the billing system. If the product is put into the trolley then it will display the amount and also the total amount. RFID card is used for accessing of the products. So, this project improves the security performance and the speed. Purchasing a product is really easy. Before going to do payment, the students should deposit amount in their college Administrative office on their Unique ID's. This complete data is stored in a separate server. When the student, faculty directory visits the canteen /library and purchases some food items. Once the device is switched on they will simply shows the RFID tag near the RFID Reader. Then it Authorizes the card and make sure that the card is authorized or not. If the card is not Authorized it simply displays as Access denied. If the card is authorized then it asks the user to enter their Valid Password for security purpose. If the password is correct it asks the user to choose an item in the menu displayed on LCD. The student select the item and then he confirms to make payment, then it is directly links to the college server through LAN and checks whether the card holder is having the sufficient fund to that Item which he has chosen. If the person is not having sufficient fund in his card, it displays as "Insufficient Fund", Deposit Amount and the process terminates. If he is having sufficient fund then it deducts the amount from that card. After finishing the payment, it displays as "Payment Successfully Completed".

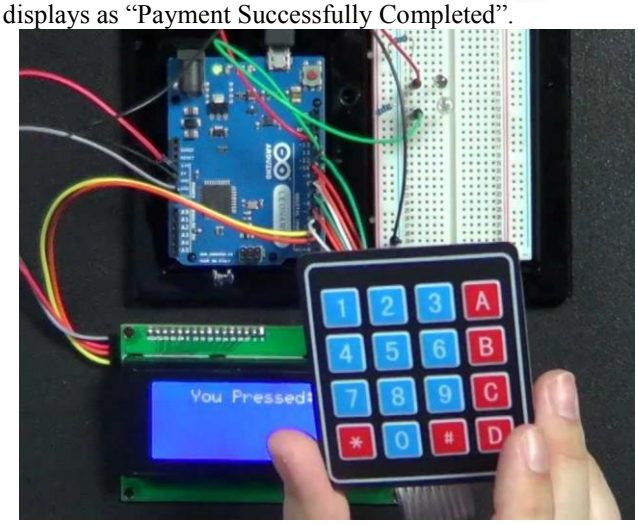

Fig. 4: Proposed system

So the person is successfully completed the payment. Now the college administration should calculate the total deductions on that month of every person and the administration should transfer the amount to the canteen owner's bank Account

A. Algorithm for Payment Procedure

Functions used for transactions are:

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1) Check_bal()
Step 1: if((Scan-Card=1)&&(Authorized-User))
Display bal:
Else
Re Scan-card
Check_bal();
2) Do_transaction()
if current bal <=0
Display Transaction can't be done
else if withdraw > current bal:
Display insufficient funds
else Current bal=current bal-withdrawl
Display successfully amount transacted
Display bal
3) Update_cash()
Enter deposit
Current_bal=deposit+Current_bal
Display bal

VI. CONCLUSION

The payment system finally concludes that the product fulfills make in India that is we can completely accomplish the digital transactions with best case of time complexity which means no loss of any small denominations and in our project we overcame some disadvantages using RFID that is no specific scanning is required with it and moreover due to frequency concept no loss of any personnel information and we doesn't require an employee, the major advantage of this product as we are using MySQL with PHP the transactions will be done in best case of time that is it takes mille seconds of time and in future we can even extend it by adding app for it to minimize time for scanning.

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