Multipurpose Student Smart Card

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Abstract: *Smart cards have been around for a while now, it has institutes and makes use of the current 'Digital India' movement. There is a need for students to carry a separate identification card and a different library card while all this could be combined into one single card with the entire detailed information of an individual student is stored in that particular card. This student card system can be usable in the educational, retail sector. The smart card will he used as means for identification and cash. From there we can see the potential and power of smart describes the overall versatility, practicality and usability.*

Keywords: *RFID,Microcontroller,web page,Database*

I. Introduction

Smart Cards have been around the world for a while and seem to be under wide usage. When we talk about ID cards, we still have institutions where we are using different cards for various purposes for e.g. a college uses a different Identification card, Library card and extra activity cards. So firstly, what we are doing is making a single digital card which is multi-purpose. This combines all the various cards into a single card. Since this world is looking forward towards digitalization, there are some more features that are added to this card keeping in mind a better future scope. This card is digital hence linked with an administration data base server. This server provides facility of debit payment methods to avoid queue at Canteens, Library Penalties, Stationary stores and also Administrative works with the help of the card. The Administrating database handles the student's data at the server including Identity, Documents, Debit balance, Library data and other if any. This card has a Unique ID and hence no chances of misguiding.

Thus, this smart card is very student as well as institution friendly reducing the load of both the ends by creating a single data base where student's details will be available and will be accessible only over students or administration's choice. This Single card will also take care of the payment queues at the canteens, stationary stores etc. which can be upgraded/refilled with the administration's help as and when needed. This Smart card will not only make the institution and student relation cleaner but also give a structured understanding of the work flow at the institution.

II. Component Used

RFID-It is a wireless,non-contact type technology. It contains two part one is rfid card or tag and rfid reader, our aim in this project is to transmit the data of rfid tag or card when its read by the rfid reader. We can use rfid card as identity card for attendance purpose.We can also use this card as a debit card for transaction purpose.

Fig 1: RFID RC522

Microcontroller- The arduino uno is a microcontroller which is an open-source, prototyping platform. Arduino will receive the data from the rfid or rfid is read by microcontroller.

Fig 2: Arduino

Wifi Module-The ESP8266 WiFi Module has SoC that is integrated with TCP/IP protocol stack .WiFi network can be access through this therefore it is access point device. The main feature of Uno WiFi is support for OTA (over-the-air)programming, either for transfer of Arduino sketches or WiFi firmware.

Fig 3: ESP8266 wifi module

III. Software Used

WebPage - A web page is web resource which is suitable on the World Wide Web. It is one of the type of document that can be accessed with the help of a web browser. It can be displayed on a monitor or mobile device as web page.

FireBase Database- It is real a time database. We can use this to control the data access . it is software for adding, accessing and managing content in database. We are using this to create database which contain all the information of the user which includes user's profile, documents, transcation details .
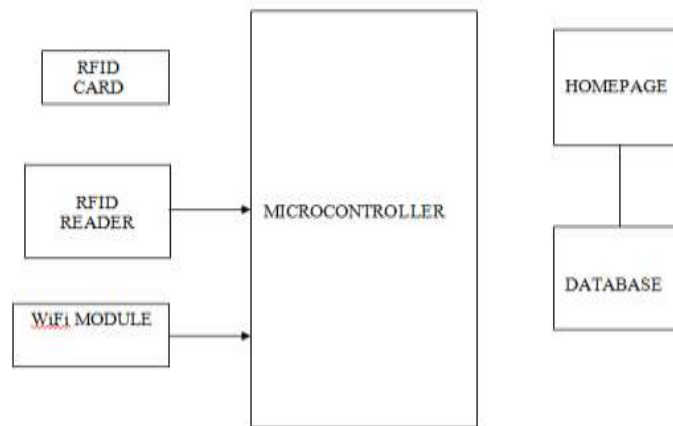
IV. Block Diagram

Fig 4: Block Diagram

➢ RFID reader and WiFi module are connected with the microcontroller. When the RFID card is scanned , it will ask for the password. And WiFi Module control the access of data.
➢ Data that is needed to accessed that will be on the local server. The local server has three section which are Database, Homepage and Verifier.

1. Verifier: Verification is done, when the RFID is scanned .
2. Homepage: It gives the pathway to database. For eg: When we click on the student's section, it will ask for the verification. Then student can update their profile.
3. Database: It will have all the information about every student who is using an RFID card.
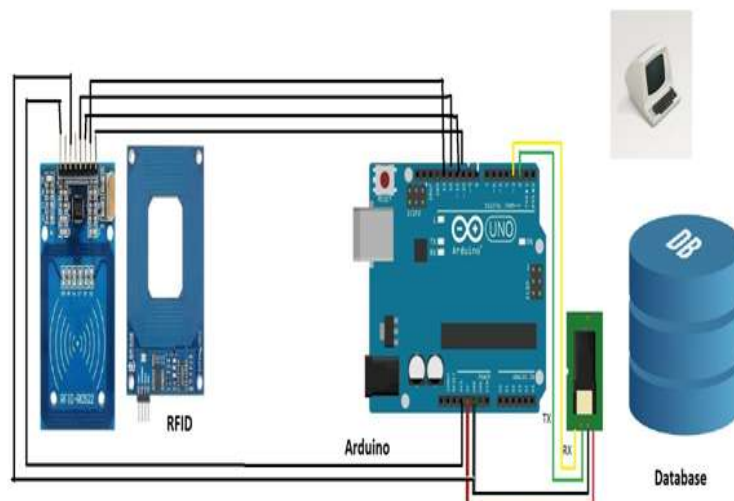
V. Circuit Diagram

Fig 5: circuit diagram

➢ When user scan the rfid card which has password then data will be send to the server . This data contains the user's basic details. That time this card acts as identity card which is used for attendance purpose.

➢ This card also contain the documents of the user which can be updated anytime by user or admin. They just need to go on the web page and click on the documents and update that .

➢ In the canteen and library we can use this as a debit card which is used for the transaction .It contains date of issue and the penalty fine.

➢ Admin can add user and update the documents of the user. Card can be rechargeable which is done by the admin. Stationary fees , form fees etc payments is done here.
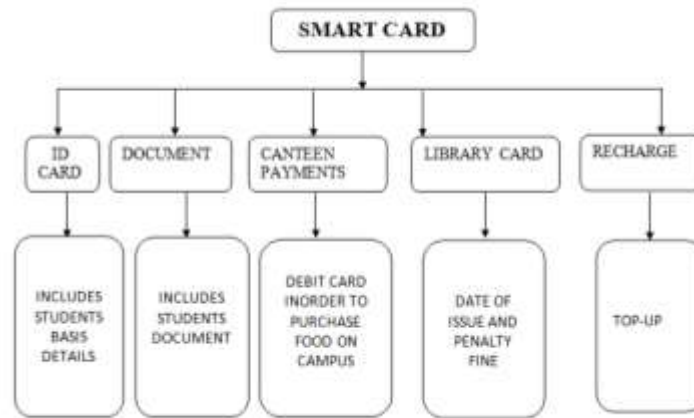
VI. Flow Diagram

Fig 6: Flow diagram

VII. Project implementation

➢ All the Information is carried out about the project as well as the components that will be used for multipurpose student smart card.

➢ We have created a design of home page for each section which will be implemented by the use of web page.

➢ We created a database on firebase which will consist of entries of student details.

➢ STUDENTS DETAILS: This table contains the complete information about students who are registered in that particular course. It contains their Name, email, contact number, Department, Academic year and their login Id & password.

➢ We extracted ID number from rfid with the help of arduino software by scanning rfid tag and rfid card using rfid reader.

VIII. Advantages

• There is now a single Smart card for all the institutional purposes.
• The Student do not have to carry document always, all it needs to carry is the portable card.
• There is no need for the student to carry money. It just needs to refill its card via administration.
• The student's records are now properly available to the administrator.
• It is secured with the students biometric data.
• Has a lot of future scope if extended towards web or mobile platforms.
• Is very easy to use and scalable as per the institutions needs.

IX. Application

• Can be used in colleges for making on-campus life simpler.
• Can be used in offices for making the back office work systematic and easy.

X. Future Scope

• The Facial recognition can be added in order to improved this project .In database variable poses of the students from its images are there to make recognition full proof.
• The Web based architecture can be utilized further by maintaining the databases on a remote server and the application will be accessible via the Internet.

XI. Conclusion

The student's digital card system was designed using WiFi Module and RFID. Thus, we can conclude that the project aims at developing a quality focused system for the institution to make it easy for students and administrator. Financial and documenting services puts the chain at ease as generation is transiting form the primitive paper-based methods to the digital paperless world. This concept will take the normal system to digitalized system which is more scalable, structured, fast and user friendly.

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