RFID Based Adhaar Card

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Abstract—*The proposed model aims for designing and developing an AADHAR card based on RFID (Radio Frequency Identification) technology. As the AADHAR is a unique identity number associated with every citizen of India, the main idea of integrating the RFID system with the existing AADHAR card is to automate the delivery of various government schemes and services to the authenticated users. All the government agencies, organizations and institutions can implement this technology. Since AADHAR database already has the personal information and the Biometrics of the cardholder, it will eliminate the use of separate biometric verification. This would reduce additional costs on technological resource and work force. The RFID card emits a wave in the radio frequency range, which the RFID sensor would detect. The sensor would be connected to a central computer to record and send the live feed to the authentication portal of UIDAI (Unique Identification Authority of India). The authentication message would be sent back to confirm the authenticity without sending any background details. This technology can be combined with the Public Transportation System, Public Distribution System (PDS), Driving Licenses, and Government Hospitals and in voting systems, which currently use EVMs (Electronic Voting Machine).*

Keywords—Rfid, Uidai, Aadhar, Pds, Evm.

I. INTRODUCTION

The human race is advancing for more innovation and discoveries. Similarly the existing systems need to be updated with the latest technology. The proposed concept of the RFID based AADHAR card is one such example.RFID is the use of radio waves to read and capture information stored on a tag attached to an object. A tag can be read up to several feet away and does not need to be within direct line-of-sight of the reader to be tracked. A RFID is basically made up of two parts, a tag and a reader. RFID tag are embedded with a transmitter and receiver. The RFID component on the tags have two parts, a microchip that stores and processes information and an antenna to receive and transmit a signal.

The tag contains a specific serial number for one specific object. To read the information encoded on a tag, a two way radio transmitter-receiver called interrogator emits a signal to the tag using an antenna. The tag responds with the information written in its memory bank. The interrogator will the transmit the read results to an RFID computer program. The main motive is to automate the services to the citizens of the country. Since the existing AADHAR database has the details of every citizen but it is not used to its full potential. All the government services which include public transportation sector, public distribution system (PDS) and other crucial sector of the central and state government which provide services to the citizens can use this technology for automation. This would reduce the additional costs on technological resources and workforce which would be required otherwise.

The real potential for achieving the desired results with UIDAI AADHAR depends on the effective execution of digitization and automation of the welfare schemes. The Unique Identification (UID) number of the UIDAI will be able to address the various issues related to the PDS sector and identify the beneficiaries. Also, the RFID based AADHAR card will play a crucial role for passport, driving license e-verification. From purchasing a bus ticket to challan of driver will all be covered under this automation. Since the AADHAR card number is linked to citizen's bank accounts, the fee would be automatically deducted from the account.Also authentication in a country is a necessary entity, which would be achieved by the RFID AADHAR card. Till now no such system of automation exists. The proposed system would also fix the loop holes which in turn curb the problem of duplication of AADHAR card and misuse of details of the authorized users.

II. RELATED WORK

1. MULTI PURPOSE CARD USING RFID TECHNOLOGY

Most often in our daily life we have to carry lot of cards such as credit cards, debit cards and some other special cards for toll system ERP, parking and personal identification purpose. Currently smart card implementations can be seen around the world but

they are not unified i.e. each developers uses different programming standards and data structures. The smart card will provide service to the user only within a university campus or an organization.[1]

2. SMART AADHAR CARD WITH RFID

SMART Adhaar card with RFID Technology paper is mainly based on the RFID technology. In this paper the technology which issued is Radio Frequency Identification technology (RFID); There is an RFID card which is issued to each and every citizen with a unique identification number in it. This card is used as unique identification number in various aspects like epassport, smart parking, hospital details and driving licence which has been explained in the following paper.[2]

3. SECURE TRAVEL SYSTEM USING AADHAR CARD

This paper proposed a public transport system whichfocuses on secure travel technique by using Aadhaarcard as a travel card. In this study we aim to explainthe use of mobile services like mobile ticketing inpublic transportation firstly, this paper provides a briefglance at secure travel system, since the passengersflow in public transportation is increasing day by dayas the population is increasing secure travel is animportant social need of today which done by usingAadhaar card. Aadhaar card. Aadhaar consist of 12-digit unique number which is the unique identificationauthority of India (UIDAI).For each and everyindividual, transaction – ID for every customer will beunique. Customer detail will be stored in the databasefor each and every route, thus it would be beneficial forretrieving the data from database in case any disasteror terrorist attack providing efficient and convenient
mechanism for recharge facility for the customer makethis system user friendly.[3]

4. UIDAIINTRODUCES 'VIRTUAL ID' FOR AADHAAR-CARD HOLDERS

The Unique Identification Authority of India (UIDAI) on Wednesday put in place a two-layer security mechanism to reinforce privacy protection for Aadhaar ID number holders. It introduced a virtual identification for the ID holders so that the actual Aadhaar number need not be shared to authenticate identity. It also places more restrictions on the storage of the Aadhaar number within various databases.The idea behind the changes is to address privacy concerns which have resulted in a legal challenge to Aadhaar in the Supreme Court, and to also prevent potential misuse of an individual's Aadhaar details.UIDAI has been under the scanner over the past few months over allegations of access of personal information by random entities without the consent of individual Aadhaar holders.The virtual ID will be a 16-digit random number mapped with the Aadhaar number. It can only be generated, replaced or revoked by the Aadhaar number holder from time to time.[4]

5.HARNESSING THE POTENTIAL OF AADHAAR VIA DIGITISATION

The real potential for achieving the desired results with Unique Identity Authority of India - UIDAI *Aadhaar* depends on the effective execution of digitization of the welfare programmes, extending banking services to the weak and the unbanked sections and linking the above two with *Aadhaar*. The government proposal on DBTs includes all of these components. Apart from reducing the leakages from the system, these ensure that the entitlements reach only those targeted.Digitization is one of the prerequisites for the implementation of *Aadhaar* enabled systems. *Aadhaar*'s de-duplication function helps to eliminate duplicate and ghost beneficiaries.[5]
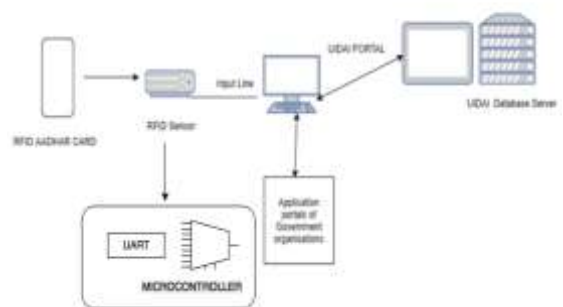
III. SYSTEM ARCHITECTURE

Fig 1 System Architecture

Fig 1 shows the system architecture diagram of the proposed model. It consists of the following components:

1. **RFID card:**Automatic identification technology which uses radio-frequency electromagnetic fields to identify objects carrying tags when they come close to a reader.

2. **RFID Sensor:** It consists of a scanner with antennas to transmit and receive signals and is responsible for communication with the tag and receives the information from the tag. It also consists of following two important components:

- **UART:** A universal asynchronous receiver-transmitter is a computer hardware device for asynchronous serial communication in which the data format and transmission speeds are configurable. The electric signaling levels and methods are handled by a driver circuit external to the UART. A UART is usually an individual (or part of an) integrated circuit (IC) used for serial communications over a computer or peripheral device serial port. UARTs are now commonly included in microcontrollers.

- **MICROCONTROLLER:** a control device which incorporates a microprocessor.

3. **UIDAI DATABASE PORTAL:** a statutory authority established in January 2009 by the government of India, under the jurisdiction of the Ministry of Electronics and Information Technology, following the provisions of the Aadhaar (Targeted Delivery of Financial and other Subsidies, benefits and services) Act, 2016.

IV. WORKING OF THE RFID TECHNOLOGY

RFID or Radio Frequency Identification System is a technology based identification system which helps identifying objects just through the tags attached to them, without requiring any light of sight between the tags and the tag reader. All that is needed is radio communication between the tag and the reader.
Basic RFID System:

3 Main Components of a RFID System

1. **A RFID tag:** It consists of a silicon microchip attached to a small antenna and mounted on a substrate and encapsulated in different materials like plastic or glass veil and with an adhesive on the back side to be attached to objects as shown in Fig 2.
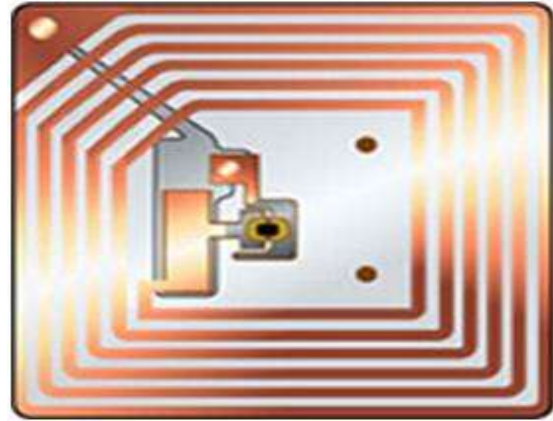

Fig 2 RFID tag

2. **A reader:** It consists of a scanner with antennas to transmit and receive signals and is responsible for communication with the tag and receives the information from the tag as shown in Fig 3.

Fig 3 RFID reader

3. **A Processor or a Controller:** It can be a host computer with a Microprocessor or a microcontroller which receives the reader input and process the data.

2 Types of RFID Systems:

- **Active RFID system:** These are systems where the tag has its own power source like any external power supply unit or a battery. The only constraint being the life time of the power devices. These systems can be used for

larger distances and to track high value goods like vehicles.

- **Passive RFID system:** These are systems where the tag gets power through the transfer of power from a reader antenna to the tag antenna. They are used for short range transmission.

V. MODULES OF THE SYSTEM

1. **POWER MODULE:** This module will be responsible for providing operational power to the whole system.

2. **SENSOR MODULE:** This will detect the presence of the RFID based AADHAR card based on the unique radio frequency. It consists of an UART(Universal Synchronous Receiver-Transmitter)along with a microcontroller.

3. **AUTHENTICATION MODULE:** This module verifies the AADHAR card number from the UIDAI database. If the AADHAR card number is verified then the required service will be provided to the customer.

4. **MAIN MODULE:** This module will act as the central interface for the whole system. All the other modules will be used through this main module. It consists of a central system with the authentication application and will be responsible for coordinating all other modules.

5. **DATABASE MODULE:**This module will hold the data of all the AADHAR card users. According to our proposed project we will be authenticating the AADHAR number from the UIDAI database.As of now we will be using a local database due to limitations.

VI. CONCLUSION

This model automates the delivery of basic government services along with the authentication of the user using RFID based AADHAR card. This in turn reduces and prevents various flaws in the current situation. Our model builds a smarter and efficient way of authentication and verification of the citizens.

VII. REFERENCES

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