ISSN No:-2456 –2165

Electronic Passport using RFID

Prof. Snehal Honade, Ayesha Sarwar, Suyog Kanawade, Akshay Hawle
Department of Electronic and Telecommunication,
Keystone School of Engineering, Pune, India.

Abstract:-A technique of programming the system for creating the valid and an electronic identification document are provided. Where in the electronic certificate or identification an electronic sign/mark is received from the user and attached to the electronic document .An electronic license/signature is attached to the document, and the whole a data is encrypted. An electronic passport act as a legal usable form of identification. The data is uploaded from the universal computing device to an approving machine which decrypts the documents. The digital license and electronic signature involved to the document are the confirmed for authenticity. Smart cards provide portable containers for an account, public key, and biometric data. They are increasingly prevalent for payment mechanisms (e.g., mobile telephone SIMs and credit cards). GSM mobile phone network million smart cards, on many cellular telephone networks, a subscriber uses a (subscriber identity module) SIM card can also provide transactional services such as remote banking, cash machines, bill paying, and bridge tolls. Our proposal uses one of these smart card methods to automate and popularize the e-passport system.

Keywords:-RFID tags, Biometric (fingerprints), Microcontroller.

I. INTRODUCTION

An electronic passport (E-Passport) is an ID document which possesses related Biographic or biometric information of its bearer. It is embedded in Radio Frequency Identification chip (RFID Tag) which is accomplished of cryptographic functionality. The successful implementation of biometric techniques in documents such as E-Passports aims to the strength of border security by decreasing the possibility of copy or fake passport and creating without hesitation of identity of the documents' holder.

The e-Passport also offers substantial benefits to the rightful holder by providing a more sophisticated means of confirming that the passport belongs to that person and that it is authentic, without jeopardizing privacy. The states are currently issuing e-Passports, which corresponds to more than 50% of all passports being issued worldwide. This represents a great enhancement in national and international security as it improves the integrity of passports by the need to match the information contained in the chip to the one printed in the document and to the physical characteristics of the holders; and enables machine-assisted verification of biometric and biographic information to confirm the identity of travelers.

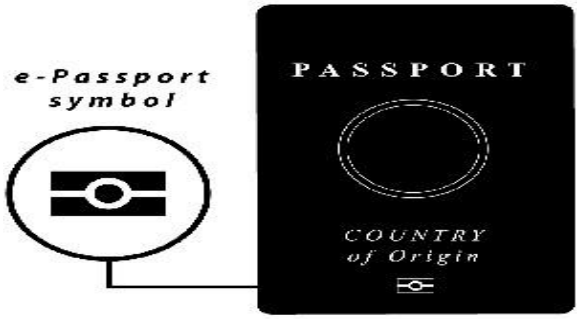

Fig 1. Symbol of Electronic Passport Defined by ICAO

For Electronic passport there is an international standard ICAO. ICAO stands for International Civil Aviation Organization. The ICAO provides boundary security standards or set of rules. Each country follows this standard but the verification method may differ for different countries.

II. LITERATURE SURVEY

An E-Passport holder holds an electronic chip such as RFIDs'. The chip holds the similar data that is printed on the passport information page such as the passport holder's name, date of birth, and other biographic information. An E-Passport holds a biometric identification. The United States (US)needs that the chip should contain a digital photograph of the passport owner. All E-Passports issued by Visa Waiver Program (VWP) countries and the United States have security features to prevent the unlicensed analysis or "scanning" of data stored on the E-Passport chip.

This Radio frequency Identification (RFID) and Biometrics technologies was proposed in paper "The study of recent technologies used in E-passport system". Personal credentials and bearers biometric data is stored on RFID chip which is used in verification process by border security officers. The next generation of e-passports will implement more advanced cryptographic mechanisms, collectively known as Extended Access Control, and in particular a protocol referred to as Chip Authentication that protects an e-passport against cloning and transferability attacks. The Extended Access Control suite of protocols has found minor attention in the literature until now. The paper analyses the study of various technologies used in E-passport design. Acryptographic security analysis of the e-passport using face fingerprint, palm print and iris biometric that are intended to provide improved security in protecting

biometric information of the e-passport bearer. Together, RFID and biometric technologies promise to reduce fraud, ease identity checks, and enhance security. At the same time, these techniques increase new hazards. They explore the privacy and security implications of this worldwide implementing next-generation authentication technology: e-passport. We describe privacy and security issues that apply to e-passports, and then analyze these issues in the context of the International Civil Aviation Organization (ICAO) standard for e-passports.

The paper presented, "Design and Implementation of secure Electronic passport system". In the Electronic passport is the digital version of the paper passport to provide stronger identity authentication. Passport verification and checking which a very time consuming process. To be ease identity checks, Lessen the amount of human errors, protect against manipulation of travel documents and improve border security issues hence, new passport turned out to be much more intrusive than the traditional one. The proposed system simplifies this process with RFID card where the unique identification number is stored which corresponds to the information of the person. The information includes the name, nationality, address etc. along with attach the copy of the required certificates required according to the application. The information is transferred to computer with the help of RF transceiver. It may also include some other features such as buzzer for audio visual indication and system to lock the door. This proposed system uses Radio Frequency Identification (RFID) is a technology that uses wireless communication for identification purposes. The key characteristic that differentiates one RFID application from another is the purpose of identification.

The paper was presented on, "Biometric Passport Validation Scheme using Radio Frequency Identification". The E-Passport or a digital passport is a combination of paper passport and electronic passport, which contains biometric information that can be used to authenticate the identity of traveler. It uses contactless but less smart card technology, including a microprocessor chip and antenna is used for powering the chip and for communicating. The antenna is embedded in front or back, or in center page of the passport. The Electronic passports include RFID cards which stores personal data of the passport owner, information about the passport such as the issuing institution, the date of issuing. In the modest form an electronic passport contains just collection of read-only documents; more advanced variants can include urbane cryptographic machines for protecting the security of the document and for the privacy of the passport owner. The passport's precarious in formation is printed on the data page of the passport and also stored in the chip. Public Key Infrastructure (PKI) is used to validate the data kept electronically in the passport chip building it luxurious and tough to fake when all security tools are fully and properly implemented. The definite choice every country as biometric security structures to be included makes a key difference in the equality of security and privacy protection.

This paper "RFID Technology Principles, Advantages, Limitations & Its Applications", give an overview of the current state of radio frequency identification (RFID) technology. Aside from a brief introduction to the principles of the technology, major current and envisaged fields of application, as well as advantages, and limitations of use are discussed. Radio frequency identification (RFID) is a generic term that is used to describe a system that transmits the identity (in the form of a unique serial number) of an object or person wirelessly, using radio waves. It's grouped under the broad category of automatic identification technologies. RFID is increasingly used with biometric technologies for security. In this paper Basic Principles of RFID technology along with its types are discussed.

The paper presented was, "The Electronic Passport and the Future of Govt. Issued RFID based Identification". In this paper, an explanation of How identification documents can be enhanced using recent advancements in technology. Various national and international airports are pursuing machine readable approaches with biometric information. The ICAO has adopted whereby the passport can store biometric identifiers Countries that participated in the Visa Waiver Program (VAP) began issuing electronic passport in 2006. However, how the usage of such advance technologies in passport is still questionable due to privacy and security concerns. This paper examines different policy regarding the electronic approaches for passport and development toward data storage and transmission using storing and transmission devices.

III. METHODOLOGY

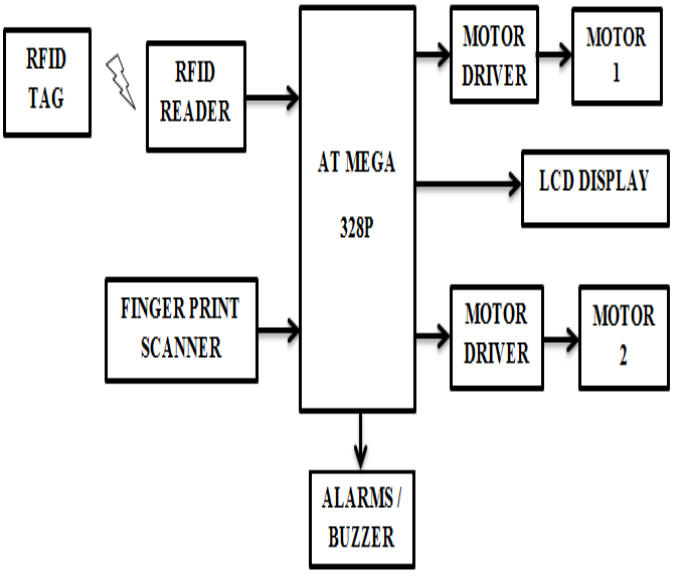

Fig 2. Architecture of Electronic Passport

The main functionality of this project is to access the passport details of a passport holder through RFID technology. For this purpose the authorized person is given an RFID card. This card contains an integrated circuit that is used for storing, processing information through modulating and demodulating of the radio frequency signal that is being transmitted. Thus, the data stored in this card is referred as the passport details of the person. The system architecture of the research work is shown in fig.. In this the details of the person would be fed into the microcontroller and a unique number is allocated to the person

that number is printed of RFID tag. The RFID reader reads the details of the RFID passport and sends the data to controller with the help of RF reader. Here, the controllers compares with the data already there. If it matches than the person is allowed to pass gate1 (motor 1 is ON).

The LCD displays give the guidance to the person to scan the finger. The fingerprint sensor is used to for biometric verification of the person. When the fingerprint is scanned it is compare to with the fingerprint stored in the controller to the respective card.

If the fingerprint match with the fingerprint stored in controller the gate2 (motor 2 is ON) is opened and when person exits it is closed. When the fingerprint are not matched the person is given are try option and still the finger is not matched the buzzer is rang indicating fraud or criminal activity.

A. RFID Technology

Radio Frequency Identification is an automatic identification whose concept is based on retrieving data from radio waves. RFID technology can be used in form of barcode and embedded chip. The RFID tagsis a small microchip designed for wireless data transmission. It contains the same information as the passport- a unique passport ID number, passport holder's name, nationality, gender, place of birth and digitalized photo. In this implementation we have used a passive RFID card. To read the information on the chip, the RFID energized the chip circuitry by wirelessly emanating power reader communicating through its antenna which usually built into the RFID reader and the RFID tags to improve signal. The designed operating range of the chip circuitry is very small; it must be held within 10 centimeters of reader.

B. Biometrics

"Biometrics is the automated measurement of biological or behavioral features that identify a person"

The major components of biometric system used in E-passport are:

- Capture
- Extract
- Create Template
- Compare

ICAO defines three biometric features for E-passport that is:

- Fingerprint Recognition
- Palm Recognition
- Face Recognition
- IRIS Recognition

The fingerprint recognition technique is used to implement and realized this project.

C. Fingerprint Recognition

A fingerprint is a pattern of ridges and furrows located tips of each finger. Compact sensor is used to obtain digital images of these patterns. In fingerprint recognition the initial image is compared with live scan image of the finger by direct contact with a reader device.

IV. FUTURE DEVELOPMENT

1. OTP option or pin can be provided if biometric fail to work.
2. Face recognition can be used for better security purpose.
3. All data can be clouded/ stored in data base for verification.
4. Eye scan technology can also be added to increase biometric identification for advance security.

V. CONCLUSION

This project gives clear idea about the Electronic passport system which is much more beneficial for the airports and universities. It also reduces the burden of documentation as well as it reduces the time consumption. We analyzed the major current and potential uses of RFID in identifying documents and the most important feature of this project is security, this will make the system centralized. The security of the system can be further increased by adding more biometric information such as palm scan, iris scan, digital signature and other active authentication in the passport system.

VI. ACKNOWLEDGEMENT

It is my pleasure to get this opportunity to thank my respective Guide Prof. Snehal Honade, who imparted valuable basic knowledge of Electronics. We are great full Electronic and Telecommunication department of Keystone School of Engineering, Pune for providing us infrastructure facilities and moral support.

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