



E-PASSPORT USING RFID TAG AND FINGERPRINT SENSOR

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Abstract : *Advancements in technology have created the opportunities for better protection of travel document ownership , however, some safety and efficiency issues remain unresolved. Since the International Civil Aviation Organization has adopted a global standard for storing biometric identifiers in passports, e-passports are convenient and quickly readable around the world. Using the life sciences for identification makes life easier and thus moves people around the world to safer places. The purpose of biometric RFID tags means that e-passports must prevent illegal entry into certain countries and restrict the use of forged documents through highly accurate identification of people. This paper analyses the biometric style of an e-passport fingerprint. These papers focuses on the privacy and personal safety of e-passport holders, which are specific countries where security can be achieved by implementing fingerprint recognition systems from e-passports. The researcher analyzed the key cryptographic characteristics, the biology of fingerprints, that are currently used in the e-passport and considered a complex procedure. Researchers are focusing on vulnerabilities because anyone trying to bypass the system will be in constant action. and vice versa, only their whims can create risks that were not there during the previous passport and border control. The paper provides a collaborative biometric fingerprint security analysis for RFID-tagged e-passports to provide enhanced security of biometric security information for e-passport holders*

Keywords- RFID reader, RFID tag, Microcontroller, Arduino UNO, Fingerprint, E-passport

I. INTRODUCTION

Advancements in technology have created the opportunities for better protection of travel document ownership, however, some safety and efficiency issues remain unresolved. Since the International Civil Aviation Organization has adopted a global standard for storing biometric identifiers in passports, e-passports are convenient and quickly readable around the world. Using the life sciences for identification makes life easier and thus moves people around the world to safer places. The purpose of biometric RFID tags means that e-passports must prevent illegal entry into certain countries and restrict the use of forged documents through highly accurate identification of people. This paper analyses the biometric style of an e-passport fingerprint. These papers focuses on the privacy and personal safety of e-passport holders, which are specific countries where security can be achieved by implementing fingerprint recognition systems from e-passports. The researcher analyzed the key cryptographic characteristics, the biology of fingerprints, that are currently used in the e-passport and considered a complex procedure. Researchers are focusing on vulnerabilities because anyone trying to bypass the system will be in constant action and vice versa, only their whims can create risks that were not there during the previous passport and border control. The paper provides a collaborative biometric fingerprint security analysis for RFID-tagged e-passports to provide enhanced security of biometric security information for e-passport holders. An e-passport is an identification card containing the holders biometric data. It is embedded in RFID tags, which is achieved through the practicality of encryption. The introduction of triple crown biometrics technology for papers such as e-passports aims to improve border security by reducing the likelihoods of paper owners. Electronic passports also offer significant benefits to legitimate holders as they make highly accurate suggestions to show that the passport is genuine but non-confidential and personal. The e-passport is currently issued at state square, which is the equivalent of about 500 passports issued worldwide. As stated in the documentation, it improves the integrity of the passport, improves the physical characteristics of the wearer, and allows for identity verification through

biometric and machine verification of account data, which is a significant improvement in national and international security tourist.

II. OBJECTIVE

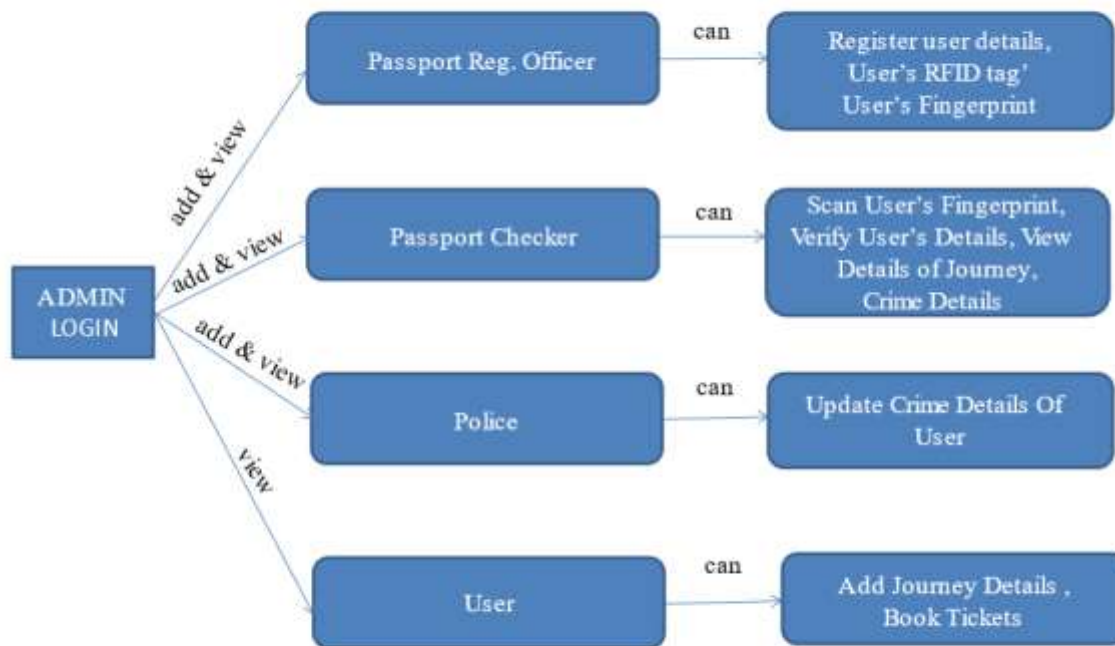
The objectives are as follows:

- Analysis and determination of the advantages of e-passport.
- Recommendations for increasing the use of valid passports.
- Development of a prototype and configuration of RFID systems and biometric passports.
- Development of an e-passport system using RFID cards.

III. LITRATURE SURVEY

Paper Name	Author	Year	Findings
Biometric based RFID based e-passport.	Keerti Srivastava , Amit K Awasthi and R C Mittal	2018	an RFID Protocol in which the answer to the question “Am I really the person who is accessing the resources” will be solved by implementing biometric techniques with RFID Protocol.
The study of recent technologies used in e - passport system.	S. Kundra , A. Dureja and R. Bhatnagar	2014	The e-passport deploys two popular technologies: Radio frequency Identification (RFID) and Biometrics. Personal credentials and bearers biometric data is stored on RFID chip which is used in verification process by border security officers.
Authentication of fingerprint scanners	Ivanov Vadimir and John S. Baras	2011	To counter certain security threats in biometric authentication systems, particularly in portable devices (e.g., phones and laptops), we have developed a technology for automated authentication of fingerprint scanners of exactly the same type, manufacturer, and model.

IV. SYSTEM ARCHITECTURE



V. METHODOLOGIES

I. RFID Technology:

Radio frequency identification (RFID) is an automatic identification method based on the concept of using devices, readers and antennas called RFID tags or transponders to extract data from radio waves embedded in materials such as labels. RFID technology is used in various identification systems in the form of bar codes and embedded chips. RFID tags are small microchips designed for wireless transmission of data. It contains the same information as the passport description page (passport holders name, nationality, gender, date of birth, place of birth and digital photo). RFID tags can be active or passive. Active tags are battery-powered tags while passive tags do not have batteries. Hence, it transmits energy using the energy it receives from the radio signal sent out by the RFID reader. RFID readers wirelessly provide power to the chip's security circuitry for reading chip information, communicating via antennas, and typically attached to RFID readers and RFID tags to amplify the signal. Design tasks depend on electronic devices with very small microcircuits. This should be very important within 4 inches of the reader

i. RFID System:

In general, radio frequency identification (RFID) is a wireless connection that uniquely identifies an object or person. RFID provides remote identification without visibility. RFID system consists of RFID tag / card, RFID reader, internal database and control unit. There are two broad categories of RFID systems: passive and active. The RFID reader communicates with the RFID tag, requesting the tag.

ii. RFID Tags/Card:

RFID tags / cards consists of an integrated circuit mounted on an antenna that is printed, engraved, or perforated onto a substrate, which is often a PET (Polyethylene terephthalate) paper backing. The insert, chip and antenna combination is then inserted between the printed label and the adhesive pad, or combined into a stronger structure.

iii. **RFID Reader:**

RFID readers, also known as interrogators, provide a link between label data and the software that needs the information.

iv. **Working Principle of an RFID based e-passport:**

In a prototype e-passport, this RFID system can be used to store passport holder information on a portable device, also known as an RFID card. This RFID card is read and processed by an RFID reader to identify the holder of this e-passport. RFID tags can be active or passive. Active RFID tags are powered by an internal battery and are read / write normally. The data on the label can be rewritten and / or changed. The size of the active memory of the marker depends on the requirements of the application. Some systems operate with up to 1MB of memory. Passive RFID tags operate without external power supply and receive the operating power generated by the reader. This project uses manual tags. Read-only tags are usually programmed with a unique set of data (typically 32-128 bits) that is passive and immutable. The reader has three main functions: power supply, demodulation and decoding. The antenna sends out a radio signal to activate the label and reads and writes data to the label.

I. Biometrics:

Biometrics is the automatic measurement of biological or behavioral Characteristics that identify a person. The main components of the Biometric system used in e-passports are:

- Capture
- Extract
- Create Template
- Compare

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

II. Fingerprint Recognition:

A fingerprint is a pattern of strokes and grooves on the tip of each finger. A small sensor is used to obtain a digital image of this model. Fingerprint recognition makes direct contact with the reader and compares the original image with the scanned image of a live finger. Fingerprints, in their most subtle sense, are the controls that remain after you rub your fingertips. In a wider use of the term, fingerprints are traces of friction control by the hand of a human or other primate. The tracks control the friction edges. The friction edge can be a protruding part of the cuticle of the fingers (fingers and toes), palms or soles of the skin, which consists of one or more interconnected knots of uneven frictional skin. This is commonly referred to as “epidermal elevation” caused by the main contact between the dermal papilla of the dermis and the interscapillary cone (retention) of the layers. These cutaneous protuberances serve to better transmit signals to sensory nerves that perceive fine textures, for example, by amplifying the vibrations that occur when a fingertip hits a pier on an uneven surface. Together, these edges help create beautiful, rough and smooth, wet surfaces.

VI. CONCLUSION

This project analyzes the most important current and potential RFID applications for document identification. An important feature of this project is the loss of security and time associated with passport verification. The incorporation of RFID technology into machine-readable documents increases resistance to identity theft.

VII. REFERENCE

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