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PASSPORT VERIFICATION SYSTEM USING RFID AND WIFI TECHNOLOGY

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Abstract:

TheprojectdesignedisanauthenticationsystemwherethepassportholderisauthorizedthroughRFIDtechnology.RFIDisanacronymforRadioFrequencyIdentification. RFID is one member in the family of Automatic Identification and DataCapture (AIDC) technologies and is a fast and reliable means of identifying just about anymaterial object. This project can be used for security purpose where it gives informationabout the authorized persons and unauthorized persons. This can be applied in real timesystems as such in recording the attendance, in the companies, airports for accessing thepassports and in industries to know who are authorized. The passport holder would have anRFID tag whichcontains all the passport details like name, number, nationality etc. Thistag has to be swiped over the reader and the information thus read is provided to anArduino. This information is matched with the one stored in the Arduino, if the datamatchesmicrocontrollerdisplaysanconfirmationmessageotherwise displaysadenialmessage on a LCD screen. The status of a particular person can also be obtained through astatus button in the system. If the passport authentication fails the servo motor closes andblocktheperson at theentry. Thedata is sent wirelessly from node 1 to node2.

Key words:RFID card,Arduino, authorized, unauthorized, Buzzer,Blynk app, RFID Scanner, etc.,

1. Introduction:

Until recently, the travel documents such as a passport where just on paper possessing only thebiographic information of the holder. However there has been a shift in technology suchthat biometrictechnologies may now be implemented in traveldocuments.When implemented in travel documentssuch as passports theseare knownas electronic passports (e-passports) aiming at strengthening securityand reducing forgery. Secure and trusted travel documents are an essential part of international security, astheyallowstates andinternationalinstitutions toidentify themovementofundesiredordangerous persons.

An electronic passport (E-Passport) is an ID document which possesses related Biographic orbiometric information of its bearer. It is embedded in Radio Frequency Identification chip (RFID Tag)whichisaccomplishedofcryptographicfunctionality.Thesuccessfulimplementationofbiometrictechniques in documents such as E-Passports aims to the strength of border security by decreasing thepossibilityofcopyorfakepassportandcreatingwithouthesitation ofidentityofthe documents'holder.

Thee-Passportalsoofferssubstantialbenefitstotherightfulholderbyprovidingamoresophisticated means of confirming that the passport belongs to that person and that it is authentic, withoutjeopardizing privacy. The states are currently issuing E-Passports, which corresponds to more than 50% ofall passports being issued worldwide. This represents a great enhancement in national and internationalsecurity as it improves the integrity of passports by the need to match the information contained in the chipto the one printed in the document and to the physical characteristics of the holders; and enables machine-assistedverification ofbiometricand biographicinformationto confirm theidentity of travelers.

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For Electronic passport there is an international standard ICAO. ICAO stands for International CivilAviation Organization. The ICAO provides boundary security standards or set of rules. Each countryfollowsthis standard but theverificationmethod may differfordifferentcountries.

This project is demonstrating the implementation of an e-passport using Radio Frequency Identity(RFID) cards to store both the biographic and biometric information of the holder. The implementation ofthe RFID e-passports might eventually replace the conventional paper passport and accelerate clearancethroughpassportcontrols.

2. Literature survey

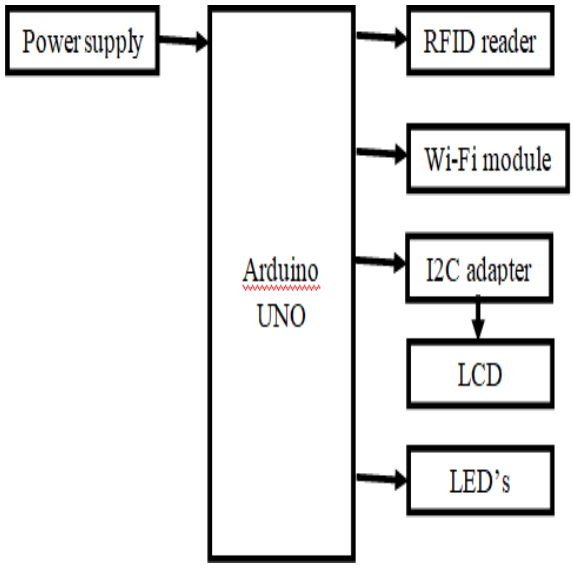
Passports and other identification documents may be enhanced using recent advancements in technology.Variousnationalandinternationalbodies arepursuingmachine-readableapproacheswithbiometricinformation.Inparticular,theinternationalcivilaviationorganization(ICAO)hasadoptedstandardswhereby passports can store biometric identifiers. Countries that participate in the visa waiver program(VWP)beganissuingelectronicpassportsin2006.However,theselectionoftechnologiesremainsquestionable due to privacy and security concerns. This paper examines policy regarding these electronicapproachesanddevelopmentstowardelectronicdatastorageandtransmission.Radio-frequencyidentification(RFID) devices forelectronicpassports andotherexisting identity documents arediscussed.

Piotr Porwik, "The Biometric Passport: The Technical Requirements and Possibilities of Using",NewapplicationsforRadioFrequencyIdentification(RFID)technologyincludeembeddingtransponders in everyday things used by individuals, such as library books, payment cards, and personalidentificationcardsanddocuments.WhileRFIDtechnologyhasexistedfordecades,thesenewapplicationscarrywiththemsubstantialnewprivacyandsecurityrisksforindividuals.Theserisksarisedue to a combination of aspects involved in these applications: 1) The transponders are permanentlyembedded in objects individuals commonly carry with them 2) Staticdata linkable to an individual isstored on these transponders 3) The objects these transponders are embedded in are used in public placeswhere individuals have limited control over who can access data on the transponder. In 2002, the U.S.DepartmentofStateproposedtheadoptionofan"electronicpassport,"whichembeddedRFIDtransponders intoU.S. passports for identification and document securitypurposes.In this paper, we usethe U.S. Government's adoption process for the electronic passport as a case study for identifying theprivacy and security risks that arise by embedding RFID technology in everyday things. We discuss thereasons why the Department of State did not adequately identify and address these privacy and securityrisks,evenafterthegovernment'sprocessmandatedaprivacyimpactassessment.Wepresentrecommendations to assist government as well as industry in early identification and resolution of relevantrisks posed by RFID technology embedded in everyday things. We show how these risks exists with manynew and upcoming applications of embedded RFID in everyday things and how these applications canbenefitfrom therecommendations foramoresecureand privacy preserving design.

3. Proposed Methodology:

Block Diagram:

Node 1:



Node 2:

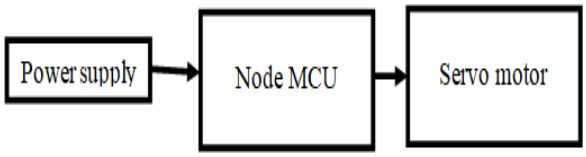


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Fig 1: Block Diagram

Working Principle:

The main functionality of this project is to access thepassportdetailsofapassportholderthroughRFIDandIoTtechnology.Forthispurpose,theauthorizedperson is given an RFID card. This card contains anintegrated circuit that is used for storing, processinginformation through modulating and demodulating ofthe radio frequency signal that is being transmitted.Thus, the data stored in this card is referred as thepassportdetailsoftheperson.Thesystemarchitectureof the research work is shown infigure 1. In this thedetails of the person would be fed into the computerand a unique number is allocated to the person thatnumberisprintedofRFIDtag.TheRFIDreaderreadsthe details of the RFID passport and sends the datawirelessly with the help of IoT. On the other side theother RF receiver receives the details and sends to themicrocontroller. Here, the controllers compare withthe data already there. If it matches than the person isallowed, less he would be termed as a criminal bygiving analarm/buzzingsignal.

Figure 1BlockDiagramofProposedSystemThisproposedsystemsimplifiestheprocessbygivingtheauthorizedpersonanRFIDtagcontainingallthepassportdetailslikename,passportnumberandnationalityetc.Once,theperson placesthecardinfrontoftheRFIDcardreader,itreadsthedataandverifies it withthat datapresent in thesystemandifitmatchesthenitdisplaysthedetailsofthepassportholder.Hereweuseardiunounocontroller.Fordisplaya16X2LCDisused.TheLCDisusedtodisplaythebasicmessagessuchas-showtag,enteryourpin,passwordmatchedorwrongpaswordetc.Thedoorcontrolisusedtolockthedoorwhenevertheuser is not authentic. The regulated power supply isused to supply power for the whole circuit. Here thekeypad is used to press the keys; here each user isassigned a password the keys are used to press theassigned password

3.1 HARDWARE AND SOFTWAREREQUIREMENTS

A. Hardware Requirement
specification:ArdiunoUno
Node
MCURFI
D
ReaderLC
D
displayDC
Motor

B. Software Requirement
Specification:Ardiuno software

3.2 Microcontroller

The controller used for this project is ATMEGA 32processor. The processor performs following task suchasreceivesdatafromRFIDreader,conformthepaswordoftheeachpersonwhichisgiventohim/herwhich is pressed with the help of keypad, perform allthenecessaryoperationsatthehardwarecircuitrysuchas giving messages to the LCD, send the data to thecomputer using the RF transceiver. Microcontrolleracts as the most important component for the hardwarecircuitry. A programtocontrol the necessaryoperationisfedintothe microcontroller.

3.3 RFIDtagandRFIDReader

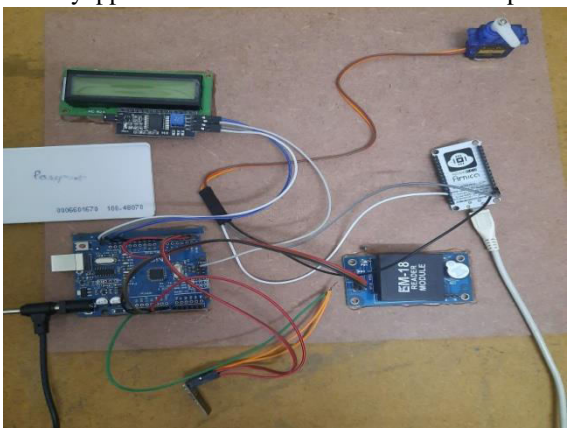
RFIDstandsforRadioFrequencyIdentificationDevice.Heretheperson‘suniqueidentificationnumber is stored in a passive RFID card and a personisidentifiedwiththehelpofthiscardandthiscard canbereadwiththehelpofthereaderandhence,theRFIDtechnology isused toidentifytheparticularuser.

3.4 Computer

Computer stores the person ‘s information to cloudusingInternetofThingsanddisplayitintheformofavisual basic application. It includes information suchas name, address and the scanned copies of the digitalphotographandotherdocumentsuchasdrivinglicenseandAadharcard.

4.RESULTSANDDISCUSSION

In this digital world, RFID technology is applied tomanyapplicationsindifferentfieldssuchastransport



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ation,healthcare,industriesetc.Thistechnologyalong withInternetofthings(IoT)facilitateswirelessidentification usingactiveandpassive tags with suitable readers. In this paper, RFIDtechnology is applied for passport verification systemtoauthenticatethepassportholder.Thisavoidsforgery and manual work associated with traditionalpassportverificationsystem.Thepassportcheckerchecksthepassenger'spassportbymeansofe-passportembedwithRFID tag.

Fig 2:Kit WithoutPowerSupply

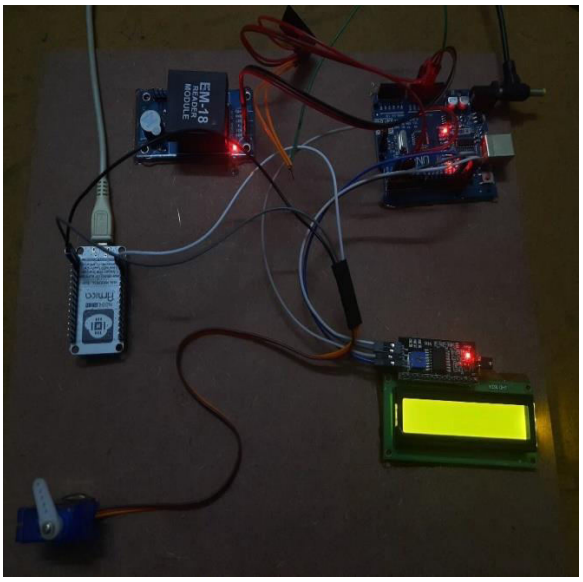

Fig 3:Resultobtainedwhenunauthorizedcardisswipedover RFIDModule

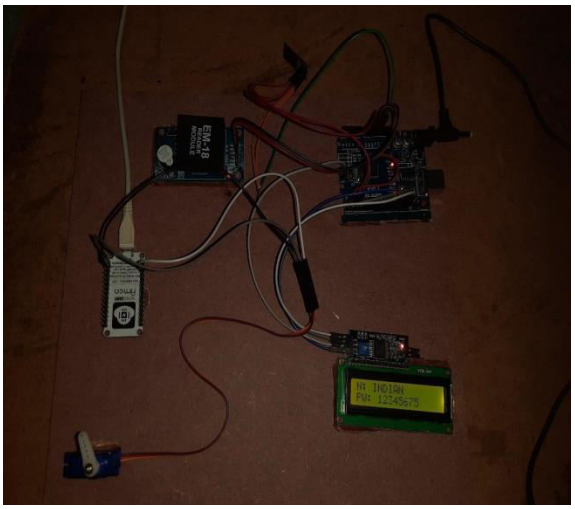

Fig 4: Resultobtainedwhenauthorizedcardisswipedover RFID Module

5. Conclusion:

The main objective of the Registrar General's Department whichincludes thepassportoffice is to effectively serve the people of Zimbabwe and security is paramount. Thisprojectendorsesthese major objectives of this department by providing a fast and more efficient wayto issue out passportsto the general public. Although now the processof passport issuanceshas greatly improved than in theprevious years, a more faster and efficient way will be provided in the sense that passports will be appliedfor and issued on the very sameday andthe waiting period will have been reduced to a few hours ratherthanthenormal 4-6 weeks of theconventional passportbooklet.

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