March - April 2020
ISSN: 0193-4120 Page No. 1936 - 1941

RFID Based Patient Information Using ARUDINO

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Abstract
RFID (Radio Frequency Identification) is a wireless form of automated identification technology. RFID is sometimes called Dedicated Short Range Communication (DSRC) .RFID system is used for identification of patient information in hospitals. It is applied in many fields. This technology has the following advantages: if an object has a Tag, Reader can recognize the ID of an object without contact. Here we are using EM-18 Reader Module that can read 100 to 300 tags per second. In this paper we proposed the system which displays the information of patient disease, ward number on the LCD screen when it scans the RFID Tags. RFID provides long term benefits to patients, in process of traceability and security of patient information system.

Keywords: *Arduino, EM-18 RFID Reader, LED, Transformer, RFID tags, Power supply.*

INTRODUCTION

In this project we designed **RFID Based patient information using Arduino**,**EM-18 RFID Reader.** RFID module is simplified effective model used to scan RFID cards. It is a emerging technology and it is enlarging day by day. Now-a-days it is widely used in offices, where employees are issued an RFID card and their attendance is marked when they touch their card to RFID reader. Now a days in movies we have seen that when someone places ones card over certain machine then door opens or closes. In short, it's a new emerging technology which is quite useful.

Though substantial progress has been made to enhance the allocation of patient medical details among healthcare providers, professionals still need to tackle the issue of effective electronic medical records. Hence, real-time details present a firm challenge to the urgency response community. In urgency situations, especially with unconscious, incoherent and unaccompanied patients, providing urgency physicians with a patient's exact medical history could be the differ for life and death.

The RFID technique has entered the healthcare sector due to its growing functionality, inexpensive, highly reliable and easy-to-use capabilities. As the present paper reveals, our major goal to design an RFID based patient information system using ARDUNIO that would exhibit efficient means to perform essential details management for urgency care across hospitals.

I. EXISTING RFID PATIENT INFORMATION SYSTEMS

1.1 Hybrid Agent Based Algorithm for an Efficient RFID-based Health Information System

Using a multi-agent paradigm in an RFID-based health information system is a very prospective approach in various domains such as urgency situations, monitoring the medication of elderly people and then automatic diagnosis. We suggest a hybrid multi-agent system, which uses both mobile and static agents for extracting so many medical records of patients who endure medical investigations in different medical units.

March - April 2020
ISSN: 0193-4120 Page No. 1936 - 1941

This paper presents an systematic and experimental assessment of the algorithm used in the information extracting process, in order to display the parameters that play a role in the efficiency improvement of the hybrid multi-agent system.

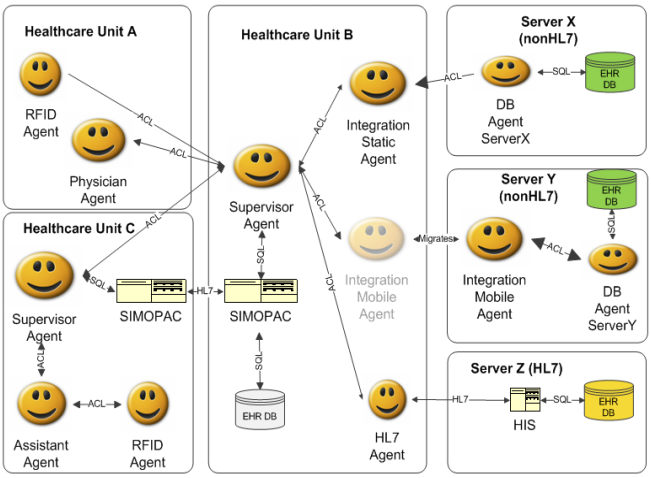

Fig 1: Updating patient EMR using hybrid agent system.

1.2 RFID Based Hospital Management System

The integration of information and communication technology (ICT) in the health related sector has been one of the significant areas of research being last two decades. The application of RFID (Radio Frequency Identification) technology is extensively used in healthcare sector to provide better, loyal and secure services. RFID systems are incorporated into hospital information systems and afford full automation and streamline the important modules of patient recognition, staff allocation, doctors, medicines and treatments. In this paper, we introduce RFID based intellectual framework for smart hospital management system which provides a healthy and secure patient data management system. We also emphasis the importance of RFID in healthcare domain with the help of an example case study with a working prototype application.

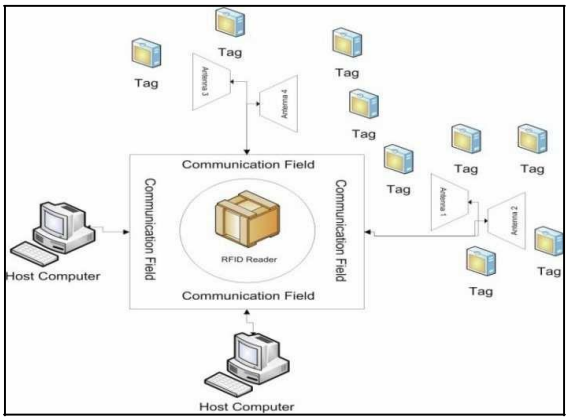

Figure2: Components of RFID systems

1.3 Dynamic Blood Information Management System Based on RFID

As a sufferer and recipient of a blood transfusion, it is crucial for him or her to receive the secure blood possible. Knowledge about the donated blood should monitor to guarantee the peculiarity of the blood source. In this paper, we introduce a RFID-based blood information management system that aims at guarantee the quality of the blood and increasing the effectiveness of operation management. In this system, the fingerprint sensor is used to enable the process of recognizing blood donor more reliable and RFID tag is used to make the management more feasible. In addition, GPRS is implemented in this method so that actual data can be forwarded between the blood mobile and blood center using wireless internet.

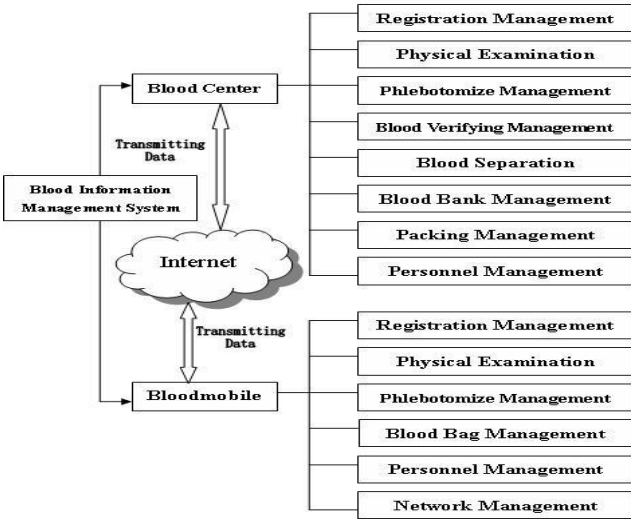

Fig.3: The transaction sequence of the reader and the tag

March - April 2020
ISSN: 0193-4120 Page No. 1936 - 1941

1.4 RFID-Based Information System for Preventing Medical Errors

A record by the Institute of Medicine of the National Academy of Sciences evaluates that as many as 98,000 people die in U.S. hospitals every year due to medical errors. In this design, we introduced an innovative IT-based approach to avoid errors in numerous medical processes by employing advances in Radio Frequency Identification (RFID) and wireless communications. The aim of the study is to conduct a detailed study of available RFID technologies for patient care in medical facilities. In the paper modern system architecture that embeds several wireless technologies such as RFID and Wi-Fi was suggested. In the pilot study, we mostly focused on the constraints and deficiencies of passive RFID technologies in medical settings. Our experimental results display the accuracy challenge in the present passive EPC Gen 2 RFID systems for use in a vigorous medical environment.

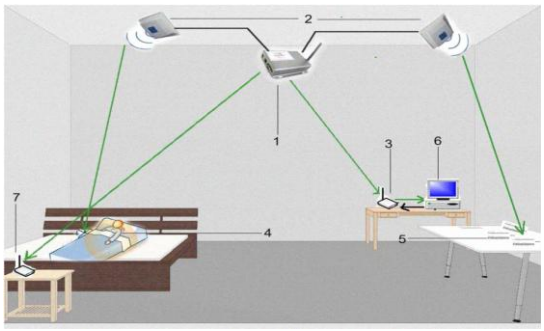

Fig 4: A Pictorial illustration of the Testbed

II.PROPOSED SYSTEM

The main objective of this paper is to provide the patient's information to the physician. Even though major growth was made in improving the section of patient medical details to the healthcare providers, professionals still need to resolve the issue of capable electronic medical records. Thus, actual data gives a persistent challenge to the crisis response community. In urgency situations, particularly with subconscious, inconsistent and unattended patients, offer emergency doctors with a patient's accurate medical record could be the variance between life or death. The RFID technology has included the healthcare sector due to its growing functionality, cost-effective, most reliable and easy-to-use capabilities. This paper demonstrates, our major goal was to design an RFID-based system architecture and data model that would provide effective means to perform essential details authority for emergency care through hospital

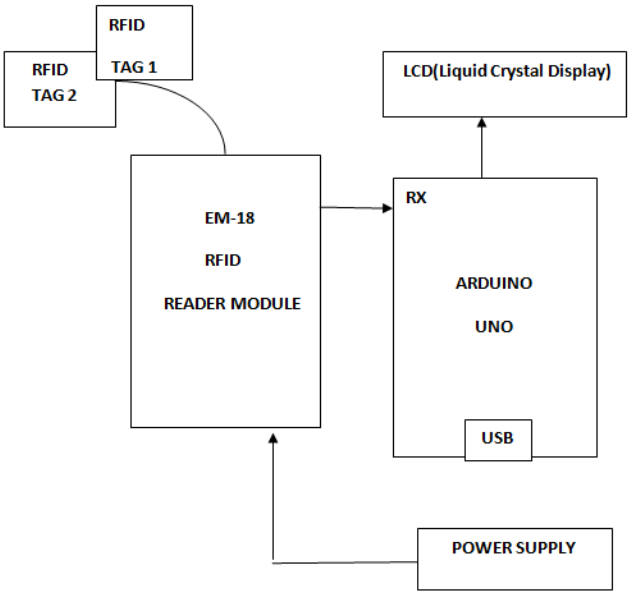

Fig: 5 Block Diagram of RFID Based on Patient Information system using ARDUINO

III.MATERIALS & METHODS

1.RFID

Radio-frequency identification (RFID) is a wireless sensor based technology which uses radio frequency in the form of electromagnetic fields to transfer data among objects. RFID has the capability to automatically identify and track objects with the help of tags attached to those objects. The RFID tags contain electronically stored information which is designed for short and long ranges as per the application requirement. RFID tags has two important components, first an integrated circuit which is responsible for information storage, processing, modulating and demodulating of RF signal and collects signals from reader. The other component is an antenna for receiving and transmitting the signal. The RFID tags are either based on chip-wired logic or a data processor (programmable)

March - April 2020
ISSN: 0193-4120 Page No. 1936 - 1941

for processing the sensor data.

Fig 6: RFID

2. LCD

A liquid crystal is a device (normally organic for LCDs) which flow like a fluid but whose molecular arrangement has few properties related with solids. The Liquid Crystal Display (LCD) is a low power device. The power necessity is in the order of microwatts for the LCD. However, an LCD needs an external or internal light source. It is restricted to a temperature of about 0C to 60C range and lifespan is an area of concern, because LCDs can chemically diminish

There are two types of LCDs which are:

1. Dynamic-scattering LCDs
2. Field-effect LCDs

Field-effect LCDs are actually used in that kind of applications where source of energy is a major factor (e.g., watches, portable instrumentation etc.).They consume less power than the light-scattering type. Though, the cost for field-effect units is usually higher, and their height is restricted to 2 inches. On the other hand, light-scattering units are accessible up to 8 inches in height. Field-effect LCD is employed in the project for displaying the appropriate details.

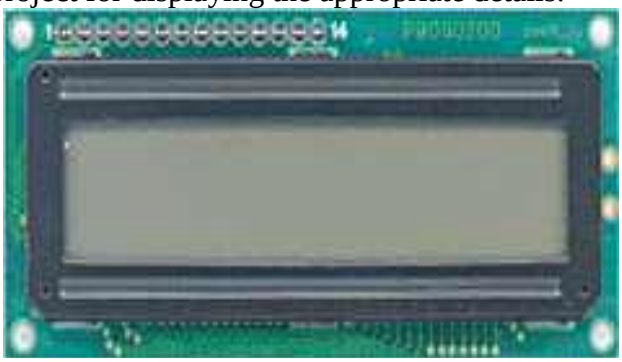

Fig 7: LCD Display

3.Power supply

The whole Project needs power for its operation. However, from the research of this project it comes to perceive that we suspected to develop 5v and 12v dc power supply. So by employing the subsequent power supply elements, essential power has been obtained.(230/12v (1A and 500mA) – Step down transformers, Bridge rectifier to transform ac to dc, booster capacitor and +5v (7805) and +12v (7812) controller to hold stable 5v & 12 supply for the controller circuit and Fingerprint module.

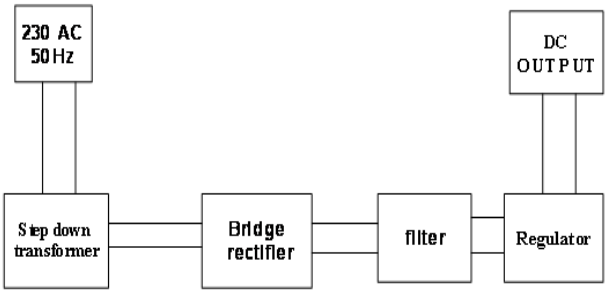

Fig 8: Block diagram of power supply

4. RFID Module

RFID is shortly for Radio Frequency recognition. RFID system contains of 2 parts. A author, and one or more transceivers, also known as Tags. RFID systems improved from barcode labels as a forms to inevitably recognize and trace products and people. You will be usually frquent with RFID systems as seen in

1. **Access Control**

RFID audience placed at entrances that require a person to pass their vicinity card (RFtag) to be" read" previously the access can be done.

2. **Contact less Payment Systems**

RFID tags familier carry payment details. RFIDs are specific to electronic Toll Collection device. Tags connected to automobiles, or brought by people convey the payment information to a fixed reader connected to a Toll station. Payments therefore regularly deducted from a consumers account, or data is altered directly on the RFID tag.

3. **Product Tracking and Inventory Control**

RFID devices are usually used to trace and register the activity of common items such as library books, clothes, factory mimes, electrical products and many items.

5.ARDUINO

The Arduino Uno board is located on the ATmega328. It includes 14 digital input/output

March - April 2020
ISSN: 0193-4120 Page No. 1936 - 1941

pins in which 6 could be used for PWM outputs, a 16 MHz ceramic resonator, an ICSP header, a USB connection, 6 analog inputs, a power jack and a reset button. That covers all the essential help needed as microcontroller. In sort to get started, they just attached to a computer with a USB cable or with a AC-to-DC adapter or battery. Arduino Uno Board differs from all other boards and they won't use the FTDI USB-to-serial driver chip in that. It is emphasized by the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.

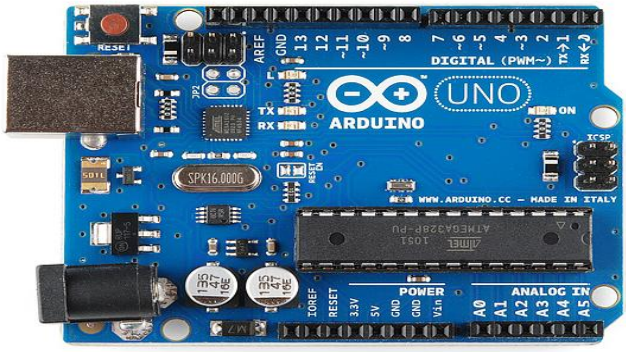

Fig 9: Arduino

6. EM-18 MODULE READER

The EM-18 RFID Reader device working at 125kHz is an afforable solution for your RFID based application. The Reader device comes in one on-chip antenna and can be powered up with a 5V power supply. Power-up the device and attach the transmit pin of the device to recieve pin of that microcontroller. Show that your card in the reading distance and the card number is dumped at the output. If necessary the device can be configured for also a weigand output.

Fig 10: pin configuration of EM-18 Reader Module

IV. HARDWARE RESULT

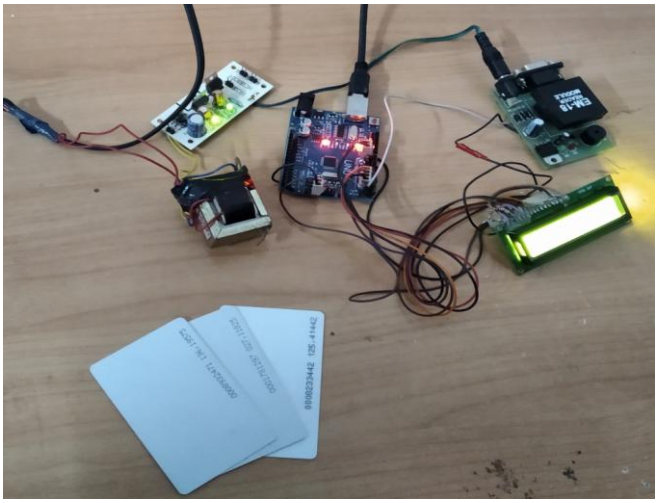

Fig : Hardware Output

- When power supply is applied- The EM-18 RFID Reader Module scans the information which is present in particular tag and displays the information on LCD screen

V.CONCLUSION

This paper has been successfully implemented. In this conclusion, "RFID based patient information system using ARDUINO" is playing a vital role in hospitals. For that purpose, a new RFID technology based on ARDUINO has implemented and tested in that study. The confirmation system provided the following advantages: The confirmation system includes the data base about the patient of RFID multipurpose card. The RFID security system is the vital role of this project. In this paper we concluded the system which displays the information of patient disease, ward number on the LCD screen when it scans the RFID Tags. Structural and process development was made, in addition, a new RFID confirmation and authorization protocol model has been used to ensure system security.

VI.FUTURE SCOPE

In this project we are using RFID module. This project is flexible and easy process of providing information about the patients to the doctors. Compare to normal manually system it is better and this can further to implement to every patient having one tag and that tag contains the total information of patient. When Tag is kept near to

March - April 2020
ISSN: 0193-4120 Page No. 1936 - 1941

the RFID reader it detects the tag and it displays on the LCD. In future we can add the more information about the patient to this tag. In future this system is to know the information about the patients within short period of time. It saves the time of users. It promises become the uniting force in hospital & recognition world. The further implementation of this project is not only the storing of patient information in RFID tags but also implementing the storage of pictorial data like X-rays, scanning reports etc in RFID tags.

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