

Smart Health Card using RFID (Radio Frequency Identification Technique)

Pravin Kumbhar¹, Dr Asha Thalange², Mahesh Shete³, Dharati Shahabade⁴ and Vaishnavi Nashte⁵

¹⁻⁵ E&TC Department, Walchand Institute of Technology, Solapur, India

Email: pykumbhar@witsolapur.org, {avthalange@witsolapur.org, shetemaresh29@gmail.com, shahabadedharati@gmail.com, vashnavinashte@gmail.com }

Abstract—Healthcare has gone through a many major changes in recent years, mostly due to improvement in electronic health (eHealth) technologies. It has been observed that patients can participate more conscientiously in decisions regarding their own care when they have access to relevant information. A lot of effort has been put into the development of new eHealth technologies to promote patient participation, enhancing information-sharing and communication with patients and improving health outcomes. Hence a service like online access to their electronic health records. This Online access to computerized medical records has the potential to improve convenience, satisfaction, and care for patients, and to open door for more efficient organization and delivery of care. In this project we are using RFID card through this card patient previous saved records can be seen and new records can be saved on IOT web server.

Index Terms— RFID(Radio frequency Identification Technology), IOT Server, CMR(Computerised Medical Records),RFID Card, RFID Reader.

I. INTRODUCTION

In the current digital period, technology is ruling humanity. A little donation of one, will take world to an advanced position of living which makes them go nearly everything at ease. The world is at its axes in upgrading itself to present technologies and inventions. To give a better medical care to all or any orders of individualities, medical field is also in its path towards up gradation. The services help croakers and receptionists to record day-to-day services handed to the people which would be stored for multitudinous times, that in turn helps people in cases of emergency. The medical systems demand advancement in the quality, capability and attainability of medical aid services, in addition to incorporating of bottommost approaches for the advanced health of citizens extensively.

Radio Frequency Identification (RFID) is a communication technology which allows for defining some unique characteristics of an object or a living being, generally its identification information, by relating it to a numeric periodical number within a label, and ensures that this number is conveyed by using radio signals. RFID provides a communication structure at the radio frequentness between a special label and anthology device that can descry the label, and allows for establishing communication between bias within the system without any physical contact, or indeed without seeing each other. There are different operations of using RFID technologies in health assiduity. When the significance of mortal health is considered, it's necessary that information is transferred in a correct and fast manner to fleetly perform the first aid to the case. By using RFID technologies as

integrated with patient information systems, it'll fluently be possible to identify cases with the RFID card that they carry and to fleetly reuse the preliminarily recorded information about that case.

Online access to medical records has the implicit to support case-centred care, to enhance convenience for cases, and to enhance patient satisfaction. Empowering cases by giving them lower access to their medical records and to link online services may, not only help in tone- operation of their conditions, but also grease association and delivery of care. Still, use of these technologies by cases is also a burden for health care providers and there are enterprises about insulation and confidentiality. In addition, patient access to their health information was factory to enhance tone- reported situations of engagement or activation associated with tone- operation, enhanced knowledge, and meliorate recovery scores, and organizational edge during a tertiary position cerebral state care installation. performance of patient access to their EHRs could help governments to rightly prioritize the event or handover of public morals, whilst taking care of original variations and fulfilling the healthcare conditions of the population.

II. PREVIOUS AND RELATED WORKS

1.Stephen E Ross ; Laurie A Moore ; Mark A Earnest ;Loretta Wittevrongel has Provided a Web-based Online Medical Record with Electronic Communication Capabilities to Patients with Congestive Heart Failure: Randomized Trial "To assess how a patient-accessible online medical record affects patient care and clinic operations. The SPPARO (System Providing Access to Records Online) software consisted of a web-based electronic medical record, an educational guide, and a messaging system enabling electronic communication between the patient and staff. ";Chen-Tan, JMIR Publications, Published on 14.5.2004 in Vol 6, No 2 (2004)

2.Freda Mold, Simon de Lusignan, Aziz Sheikh, Azeem Majeed, Jeremy C Wyatt, Tom Quinn, Mary Cavill, Christina Franco, Umesh Chauhan, Hannah Blakey, Neha Kataria, Patients has provided online access to their electronic health records and linked online services: a systematic review in primary care "The impact of providing patients with access to their general practice electronic health records (EHR) and other EHR-linked online services on the provision, quality, and safety of health care. Theodoros N Arvanitis and Beverley Ellis,British Journal of General Practice 2015; 65 (632): e141-e151. DOI: <https://doi.org/10.3399/bjgp15X683941>

3.Mohammadariful Basher and Palash Chandra Roy it aims to recommend a PDA based e-Health card system where a smart card for patient recognition which improves global medical system. It also explains how ICT services can advance the medical sector via e-Health card in rustic areas of Bangladesh. Accordingly, this electronic card can save patients medical history and decline the bribery of medical sector.

III. PROPOSED METHODOLOGY

The proposed system aims to have a paperless system besides automate and ease the process of maintaining the case's medical details that provides the medium to collect, store and further the data to the medical information system and have a secured database. Software design of the system substantially consists of the patient information system. Once the card information is attained by RFID communication, they can be reused in the information system in the operation.

MODULE1 : Radio frequency Identification for Smart Card

In this project by using RFID card and reader the patient records are saved on IOT server though serial terminal on lapto p. The main Arduino gathers information and authenticates the patient by user Id and password and shows his patient's previous medical history data. After checking the records, the medical man or doctor can enter a new data by scanning RFID card and though Serial terminal in laptop. The following block diagram in figure 1 shows the proposed model for the system.

The RFID health card for a case is issued by a staff of hospital for his first visit. During discussion croaker can have an access to the patient medical history and can also modernize his current health status. The test specified by the croaker can be viewed via the health card.

Algorithm followed:

The algorithm describes how the Software design of the system is mainly consists of the patient information system. Once the information is collected by RFID communication it can be further processed in the information system in the application for medical use. Here the following image represent the algorithm of the RFID Card which helps to explain how the Smart Health Card Using RFID system works.

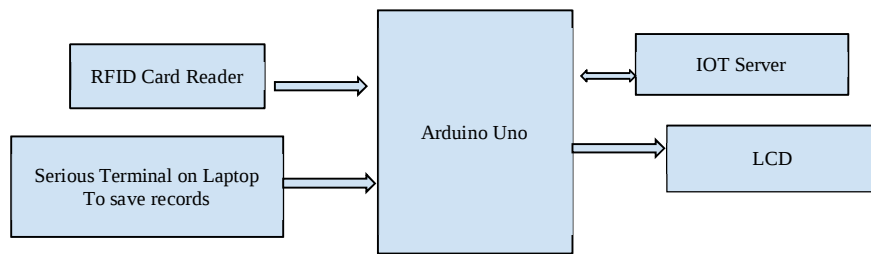


Figure 1: Block diagram for the proposed model

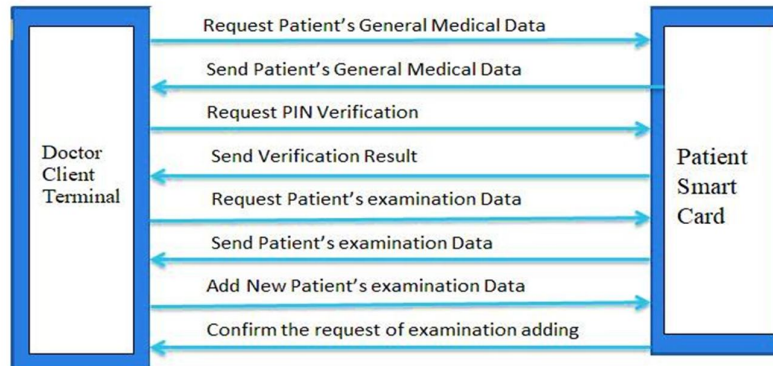


Figure 2: Patient Smart Card Communication Session

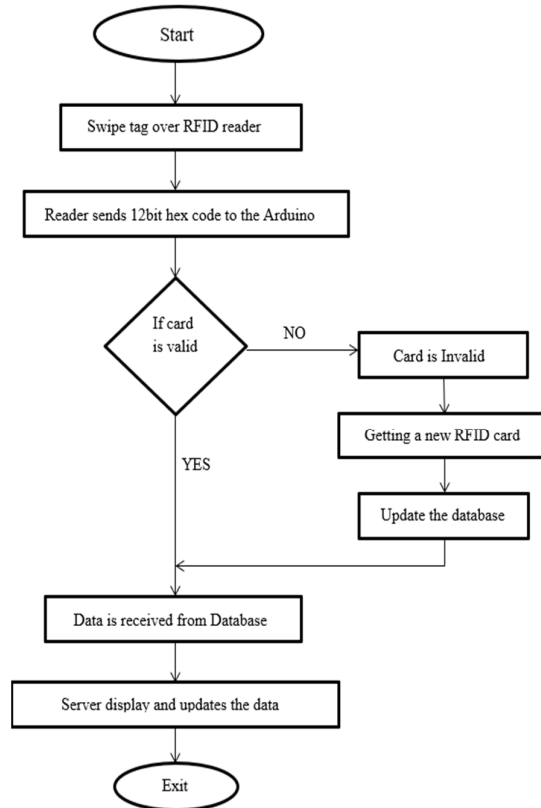


Figure 4: Algorithm of System

MODULE2 : Patient's Data Processing

With these we can add doctor, hospital and patient information. which is also used to register for doctor and patient. Admin can include the authorization to delete the patient, doctor and the hospital information. The persons who are authorized can operate the system. Depending on these the authentication process, the screen which is used to login has a basic interface as shown in figure 5.

A screenshot of a login window with a light blue background. At the top, it says "LogIn to see your Device Tweets...". Below this are two input fields: "User Name" and "Password". At the bottom, there is a green "Login" button.

Figure 5: Login Window

The instance when the patient consults a doctor, the doctor used to login with the credentials issued if fails it requests for the login again. After logging in successfully the doctor have an access to the database of patient which includes the patient's history of treatment, medicines prescribed and medical reports. The doctor can update prescription and treatment thus keeping track the medical status of the patient

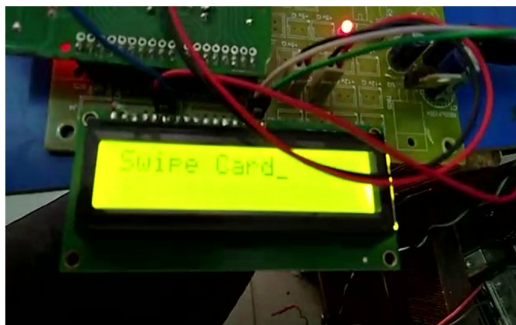


Figure 6: Card Swapping

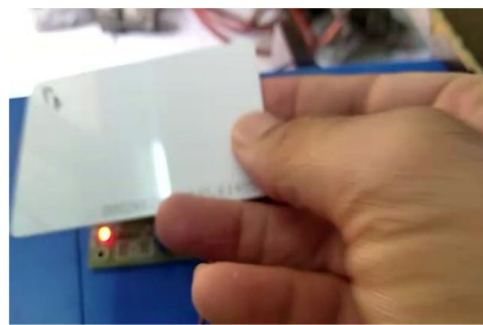


Figure 7: Card Scanner

We have seen in above figures after scanning it will ask for input and will display all the information of patient which is given by doctor which is described in images below. A low-power radio wave field is emitted by the RFID Reader which is used to power up the tag so as to convey any information that is contained on the chip



Figure 8: Entering Data

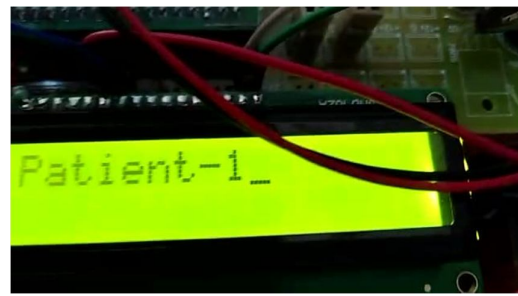


Figure 9: Pop up Message

The images show how RFID Smart Card works when it comes in contact with RFID Reader. The tags are known as transponders as that have an identifier of the object with which it is associated. The tags typically consist of an

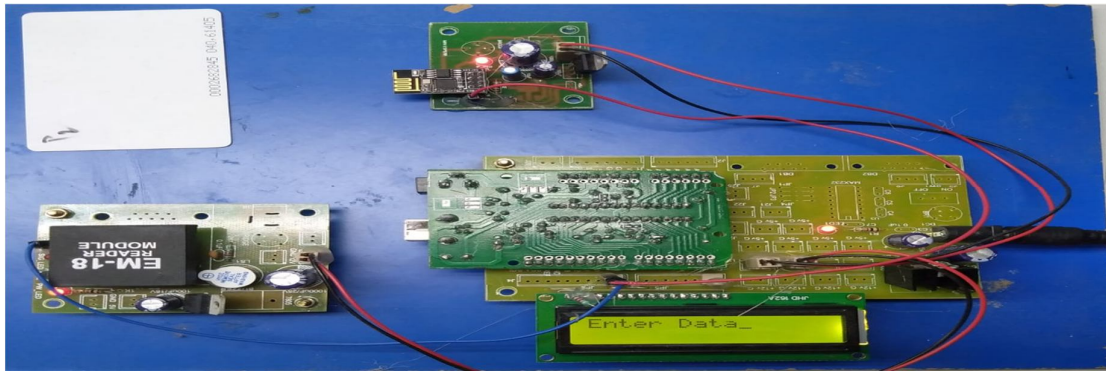


Figure 10: Circuit of Smart Health Card Using RFID

antenna and an electronic microchip. The antenna is responsible for making communication between the tag and the reader.

IV. RESULTS

The following are the results when the data of the patient has been saved on the server by the admin.

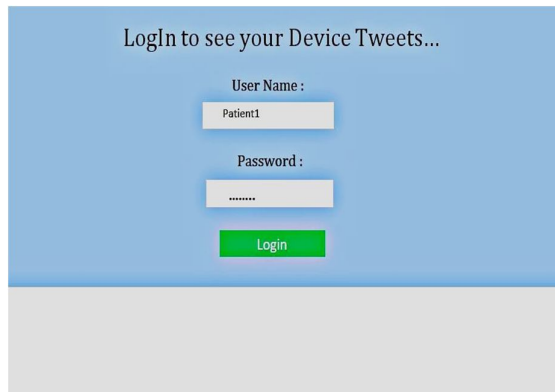


Figure 11: Login window with Login Credentials



Figure 12: Medication of Patient

When once the data is saved on the server by doctor it is used for various purposes with which the patient is able to have paperless medication and have his medical history with a single scan. Medication history of patient is seen on the server in the following image which is used by doctors in emergency and as well as by patient for various purposes.

Hello.. patient1 Welcome to IOT Server

Refresh

Switch to Graph View

Page 1 of 1

S.No	Patient_Name	Patient_data	Date
1	Patient2	Thyroid_Levothyroxine	2022-03-28 21:21:3
2	Patient2	Sugar_Metformin	2022-03-28 21:21:0
3	Patient2	BP_Pindolo	2022-03-28 21:20:48
4	Patient-2	medicine-2	2022-03-19 14:15:44
5	Patient-2	medicine-2	2022-03-19 11:49:03
6	Patient-2	medicine-1	2022-03-19 11:47:10

Figure 13: Patients Medical History Displayed on server

V. CONCLUSION

In this work, secured-health system has been proposed. It facilitates to transfigure quality of health care sector. This would get better health inflow in congested hospitals of imperative countries like India and citified nations. Health care related data is not stable which turn out to be complicated to administer and develop. because of these a smart health card system has been created which can store up big health data in safer approach. It safeguards the data from illegal druggies and also advances the safety by using encryption algorithm handed by the pall database. Hence from the below results we can gain a paperless system and automatic conservation of patient medical details. This system effectively reduces death rate and illegal operation of drugs. Online access to motorized medical records appears to be safe and is associated with bettered glycaemic control. Using Health Monitoring System, health care providers (e.g., hospitals) ameliorate case's safety by landing introductory data (similar as patient unique ID, name, blood group, medicine disinclinations, medicines), help/ reduce medical crimes, in- crimps effectiveness and productivity, and cost savings through wireless communication. The RFID technology has palpable benefits similar as reduced cost and time, reduced mortal coffers and ameliorate productivity.

REFERENCES

- [1] Ross SE, Lin CT. "The effects of promoting patient access to medical records: a review. " J Am Med Inform Assoc 2003;10(2):129-138. [PMC] [Medline] [CrossRef]
- [2] Ross AP. "The case against showing patients their records. " Br Med J (Clin Res Ed) 1986 Mar 1;292(6520):578. [Medline]
- [3] Balakrishna K.,. (2020). "Fusion Approach-Based Horticulture Plant Diseases Identification Using Image Processing. " In S. Chakraborty, & K. Mali (Eds.), Applications of Advanced Machine Intelligence in Computer Vision and Object Recognition: Emerging Research and Opportunities (pp. 119-132). Hershey, PA: IGI Global.
- [4] Introducing an e-Health card for Developing Countries: A case study of Bangladesh" Mohammad ArifulBasherand Palash Chandra Roy, Stockholm University,Sweden,2011.
- [5] Hertz CG, Bernheim JW, Perloff TN. "Patient participation in the problem-oriented system: a health care plan. " Med Care 1976 Jan;14(1):77-79. [Medline]