RFID Tag Based Hospital Management System

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***Abstract*--This contribution deals with efficient hospital management and gives an overview of management done in hospital with the help of a tag which is an RFID tag and by maintaining hospitals personal database. This article describes how current hospital management system can be replaced by the following hospital management system described ahead.**

Keywords — RFID;Hospital Management System.

I. INTRODUCTION

There are many systems that have been developed related to the medical centre management system, but however these systems are too complex. Intelligent system should be developed to reduce the cost of the medical services by achieving high operational efficiency and providing better services at an affordable cost. With the increasing number of health issues across different parts of the world, there is a need of management system with efficient patient and doctor identification, to store and retrieve patient records to ensure a proper context between the patient and the correct medical documentation[8].A systematic approach to the way documents are managed can transform hospital resources to its highest utility and advantage. System has Admin, Doctor, Nurse, Administration, Pharmacist, Laboratories and Patient modules [5][7]. Payroll and attendance records of employees can be maintained. Medicines updated inventory record can be maintained[5][7]. Blood donors record can be maintained and they can be called as needed [5][7].Taking into consideration all the above factors, we look after a better management in a hospital described further.

II. OVERALL SYSTEM DESCRIPTION

Before we start with Block Diagram and Working we look over the components used in the block.

A. Components Required

- A PC in patients ward which will have an application running for entering patient details (medicines prescribed, test recommended ,etc) by the doctor.
- At patient side Embedded kit blocks which will have an RFID Reader, a PIC microcontroller, Zigbee transmitter and receiver, PC or Laptop or Tab as display, etc.
- An RFID Tag for patient.
- At server side- Zigbee transmitter and receiver and a PIC microcontroller.

B. Block Diagram and its flow

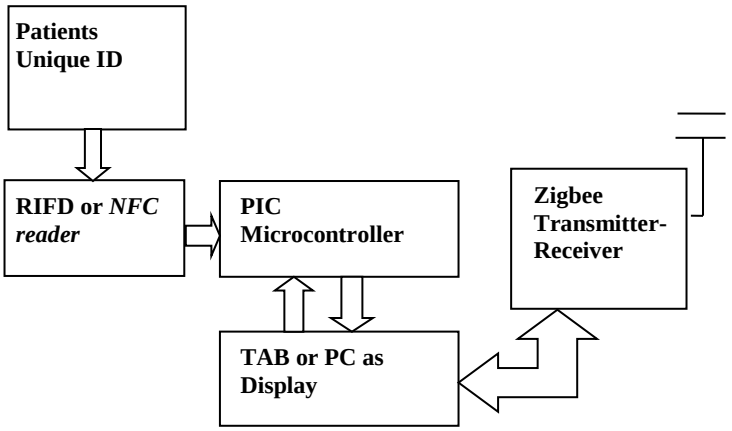

Fig. 1.Block Diagram of system at patient side

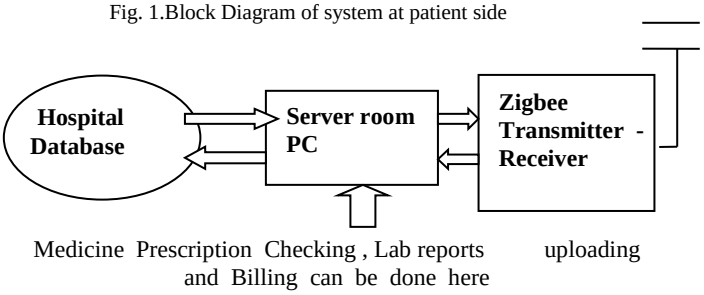

Fig. 2.Block Diagram of system at server room

Fig. 1 and Fig. 2 show system Block Diagram. Initially ID of the patient that are generally RFID passive tags will be read by RFID or NFC reader when ID is brought in close proximity to the reader. RFID Tag has memory that has unique number stored in it. Reader reads this number and transmits the RFID value to PIC18F4520 microcontroller. PIC microcontroller decodes that value to a value that can be read by the PC or the application running on PC and PC transmits this value to the ZIGBEE transmitter. ZIGBEE transmitter transmits the unique number to the Hospital server. The ZIGBEE Receiver at the Hospital server room receives the data and transmits the number to the server room PC. The server room PC validates the number and after validating provides access to the user on the patient side to operate on the data space created for the particular ID. The user on Patient side can also fetch data of the patient stored in the hospital database.

In the above case, the PC after validating the ID number, fetches the data of that ID number and transmits it to the server side ZIGBEE transmitter. The ZIGBEE transmitter transmits the data of the patient to the patient side and the ZIGBEE receiver at that side receives the data. The ZIGBEE receiver after receiving the data will transmit the data to the patient side PC where the data of the patient is displayed and can be seen by the user or the doctor .

C. Hospital Management Description

The patient to be admitted is assigned with a RFID tag at the reception. Patient carries Tag with him. When a first doctor enters the ward, he monitors all about patient and feeds all the data in hospital database through a PC at the Ward. The doctor while feeding asks for patients ID Doctor carries a kit with him or else can have a fix setup at the ward. He reads patients ID through an RFID Reader. The RFID Reader reads the data and transmits the data to PIC Microcontroller which decodes the data and sends all the data to the server room through a Zigbee transmitter. The server provides access to the doctor for a particular patient in hospital database. The Doctor enters all the data in PC (application running on PC) and after he saves the data, data transmission occurs to the hospital server room through Zigbee transmitter. The Zigbee Receiver at the Hospital Server Room receives the data and saves the data in hospital database. Next time when a second consultant doctor visits the hospital he goes at the ward directly without need of a concerned person who tells him about the Patient neither he needs Patients File to check and starts his patients diagnosis and treatment by getting details of the patient by using patients ID and kit i.e. approach done by doctor 1.The second consultant doctor can read the monitoring done by Doctor1 and also his opinion, medicines prescribed and lab tests recommended by Doctor 1 and accordingly can continue with his treatment. He can also write his opinion further. So next time a third Doctor Visits the hospital he can read patients records and prescription given by Doctor1 and Doctor2 and also can add his opinion. The Medical department of the hospital can also check for medicines to be given to the patient prescribed by the Doctor either from the server Room or from the respective Patients Ward and can make available the medicines to the patient in their wards. The Laboratory tests recommended by a Doctor can be conducted in the Lab and its Reports can be uploaded in the patients database at the server room[5].So whenever a doctor needs to check patients reports he can check directly from patients ward using patients ID and accessing his database. The billing sessions of the patient can be directly created from the server room itself without need of co-ordinating with other hospital departments. Also every department of Hospitals and every doctor has to give proper authentication before accessing patients or Hospital Database [4][1].

III. DRAWBACKS OF EXISTING SYSTEM

A medical centre that supports medical cases of patients and other services. The medical centre has high increase in the number of patients. The maintenance of records of these patients is manual. The file for each patient is kept and retrieved upon subsequent request. Normally patients are given identification cards at the reception which are checked to verify to check whether they have their records or files there. If not a new file is created with patients details and in which future consulting details will be recorded. Due to the increasing number of patients, several problems will be arrived. The problems faced are as follows:

A. Lack of immediate retrieval:-

The information will be very difficult to retrieve and to find particular information like-Eg: To find out patient's history, the user has to go through various registers. This results in inconvenience and wastage of time [1].

B. Lack of immediate information storage:-

The information collected from various transactions takes time and efforts to store at right place [3].

C. Lack of prompt updating:-

Various changes to information like patient's details are difficult to make as paper work is involved [2].

D. Error prone manual stock taking:-

Manual stock taking are error prone and take a lot of time this may result in incorrect information. For example, about the medicine in stock [3].

E. Preparation of accurate and prompt reports:-

This becomes a difficult task as information is difficult to collect from various registers [3].

IV. PROPOSED SYSTEM ADVANTAGES

The proposed Hospital Management System using an RFID Tag is a device in which we can monitor patient's data and reports in a very organized manner. The benefits of the proposed system can be listed as follows:-

A. Planned approach towards working:-

The working in the organization will be well planned and organized. The data will be stored in data stores, which will help in retrieval of information and storage [6].

B. Accuracy:-

The accuracy in this system will be higher. All operations will be done correctly and it ensures that whatever information is coming from the centre is accurate [6].

C. Reliability:-

The reliability of the proposed system will be high due to the above stated reasons. The reason for the increased reliability of the system is that there will be proper storage and access to the information [6].

D. No Redundancy:-

In the proposed system utmost care will be taken that no information is repeated anywhere, in storage or otherwise. This would ensure economic storage space and consistency in data stored [6].

E. Immediate retrieval of information:-

The main objective of the system is to provide for a quick retrieval of information. Any type of information will be available whenever the user requires [6].

F. Immediate storage of information:-

In manual system, there are many problems to store large amount of information while the proposed system makes it easy [6].

G. Easy to operate:-

The system will be easy to operate and should be such that it can be developed within short period and will fit in the budget of user [6].

H. Excellent Patient Database Management:-

In this case, hospitals have each & every patients detail arranged in a well organized manner & accessing any patient's details whenever required becomes easy while in current system it results in lots of paper and file work and also getting any patients detail if needed becomes too difficult.

I. Organised and Independent Working Of all Hospital Departments:-

All hospital departments work independently as such a visiting or a consulting doctor need not a hospital staff to give a patients detail as he can get all the details of the patient using his ID. Also preparing patients bill becomes easy for the concerned person as he need not coordinate with other departments and interrupt them.

J. Lessens burden of person with Patient:-

Patients family or person with him don't have to run for medicines as they are made available in the ward after checking patient database and also lab reports as they are directly uploaded in patients database.

K. Secured Patient Database:-

Every doctor and every ward has to give proper authentication before he accesses database and hence no misuse can be done with patient's database [3].

V. CONCLUSION

The project is for computerizing the working in a hospital [4]. The software takes care of all the requirements of an average hospital and is capable to provide easy and effective storage of information related to patients that come up to the hospital. As we can clearly find how the proposed system rectifies maximum errors in the existing system and can make hospital management more efficient and easy. The idea undoubtedly can prove to be a boon in the field if implemented. There is a lot of work that needs to be done as well as there are many more applications such as ward attendance, house keeping,etc which can be explored further.

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