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Smart Medical Document Card

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Abstract – Health care systems nowadays are slowly transforming into an e-health care systems having a purpose to reduce manual intervention at the upmost level as possible and to improve the quality of medical health care. Radio frequency identification (RFID) is a technology that has a great impact on the health care industry. This technology provides a convenience to the patients who are unable to communicate during emergency situations. This paper describes the use of RFID technology concerning a patient's medical health records and its uses in different areas such as in pathology labs, pharmacy etc. We describe a design of a smart medical document card using RFID by giving general purpose architecture of this system that is used to store and present information at the time of need to the doctors.

Keywords - e-health care system, emergency care, medical records, RFID. SMDC.

1. Introduction

Radio-Frequency Identification (RFID) is the use of radio waves to read and capture information stored on a tag attached to an object. A tag can be read from up to several feet away. A RFID system is made up of two parts: a tag and a reader. RFID tags are embedded with a transmitter and a receiver. The RFID component on the tags has two parts: a microchip that stores and processes unique ID, and an antenna to receive and transmit a signal. The tag contains the specific serial number for one specific object. To read the information on a tag, a two-way radio transmitter-receiver called an interrogator or reader emits a signal to the tag using an antenna. The tag responds with the information written in its memory bank. The interrogator will then transmit the read results to an RFID computer program.

The use of RFID (radio frequency identification) technology in healthcare systems can be used not only for bringing down health care costs but also facilitate automating, patient identification processes in hospitals, use of mobile devices like mobile phones and for design a health care management systems. Medical errors could be prevented by building a safer healthcare system. Recently, the RFID has been applied in hospital management. The RFID is valuable for quickly retrieving patient information and monitoring patient locations in the hospital. The growing sophistication of computers and software should allow information technology to play a vital part in reducing that risk — by streamlining care, catching and correcting errors, assisting with decisions, and providing feedback on performance. An advantage of this system is to improve patient safety, save time, and reduce costs but also causes critical issues for successful implementation.

2. Literature Survey

Hospitals are trying to find solutions to reduce the expenses related to healthcare. Mistakes in healthcare have become leading cause of healthcare issues or death. [1]

The Smart Medical Document Card (SMDC) system aims at simplifying the task of gathering data of patient form the database by the hospital authorities so that their family members can be informed and called upon in case of emergencies. RFID is used to implement this kind of system. [2]

Less than 10 percent of hospitals have warmed up to RFID technology. The idea is that by using resources more effectively, hospital staff can spend less time running around trying to find medical supplies and more time with patients. The reason why healthcare costs are so high is hospitals keep buying things they already have and waste money. Hospitals have been so focused on the priority of saving lives that they have been slow to adopt technology that saves money. The hospital also wanted to get a better handle on its management. By attaching this RFID technology to this system or in healthcare system, it provides some capabilities like identification, tracking, location and security. [3]

There are 3 uses of RFID technology in medical field: tracking patients, tracking equipment and tracking staff. Medical machineries are highly expensive and RFID systems can also avail you with the efficient tracking of these machines, which can be advantageous for the hospital. RFID tags can help the hospitals to find that equipment, when needed. With this hospitals can keep the

proper record of all the patients. RFID tags can help the hospitals to find that equipment, when needed. With this hospitals can keep the proper record of all the healthcare industry; it can help any hospital to track/trace the prescribed drugs. The system is reducing the time that staff members spend finding equipment and each other, and it informs them when a colleague is attending a patient and shouldn't be interrupted. Similarly, family members are now directed more quickly to patients. And misplaced equipment can now be easily located and returned to its correct place. All this is allowing the clinical staff to spend more of their time on activities that benefit patients. Some hospitals are taking innovative approaches to RFID.

3. Proposed System

The RFID technology is widely used in the health care systems for identification and tracking of patients.

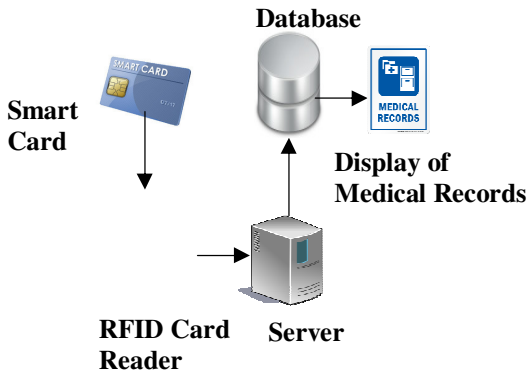

Fig 1: General system architecture of SMDC system

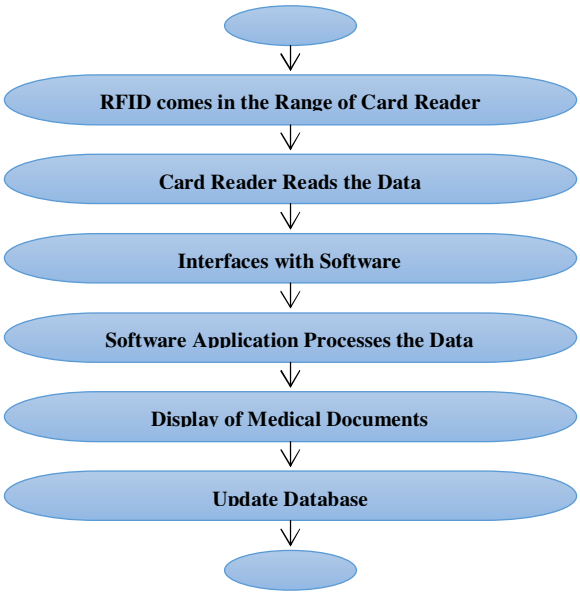

Fig 2: Basic work flow of RFID based SMDC system

The tag consists of two basic parts namely- a small integrated chip and the antenna. Antenna provides communication between RFID reader and the RFID tag for data transfer. The RFID reader generates analogue signals and converts them into digital signals. The card reader is connected to the server. The card reader transforms digital information that can be passed on to the server for further processing to displays medical records. Patients' basic information such as patient name, id, location, blood group can be stored in the back end database. Even the pathology labs and medical stores can access the card to update reports and medical prescriptions. Following are the general system architecture of the SMDC system.

4. Benefits

Potential benefits such as improve patients' safety, elimination. Paper-based document, cost savings, increases efficiency and productivity, reduce medical errors, reduce patient waiting time, increase scalability, reliability. Provides security.

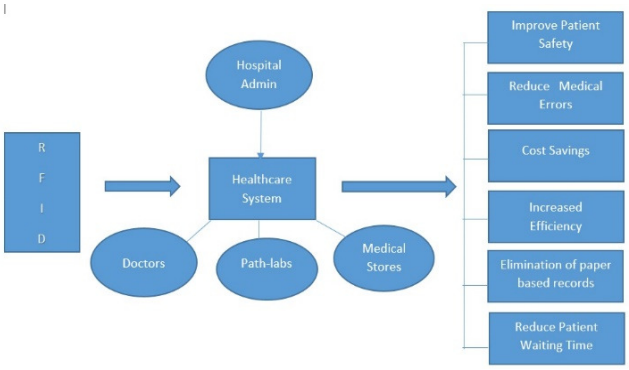

Fig 3. Benefits of adopting RFID-based Healthcare System

5. Conclusion

RFID based Health Care Systems provides various benefits in many human health care centric applications. Using a Smart Medical Document Card (SMDC) unique identification of patient, improvement of patient's safety by obtaining their basic data such as (unique ID, name, address, and blood group) can be done. Using RFID technology patient monitoring and patient tracking can be improved. In Smart Medical Document Card, quality of patient care will be increased and medical errors will be avoided.

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