RFID-Based Hospital Real Time Patient Management System

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***Abstract*— To create standards-based secure access to patient's personal data and medical records by using RFID tags and Web Service with the help of hardware kit. This system uses Web service interfaces to support standard Electronic Health Records for patient record interoperability. Customers can view and update their personal medical information via the web site, which seamlessly sync with one another. Because the system is built on Web services, it is easy to update, adapt and grow. Trying to identify an unconscious patient or patient who is unable to communicate can lead to delays in treatment. With this system emergency departments improve efficiency while enhancing the level of patient care. This project uses the hardware kit to get the patient id. The hardware kit will send the patient id to the serial port of the system. Hence tracking and monitoring of patients, their case sheets and medical equipments can be efficiently carried out. However, the reality of RFID adoption is far behind earlier expectation. This study reviews the literature on RFID applications in healthcare based on a formal research framework. We aim to identify current opportunities, potential benefits and adoption barriers. Our study shows that most care providers indicated that RFID to be functional and useful in asset tracking and patient identification. Major barriers to RFID adoption in healthcare include prohibitive costs, technological limitations, and privacy concerns. Although RFID offers healthcare practitioners advantages to enhance clinical practice, better designed RFID systems are needed to increase acceptance and proper use of RFID in healthcare.**

***Keywords*—RFID, Electronic Health Record, Tracking, Monitor*ing*, Healthcare.**

I.INTRODUCTION

The pharmaceutical drug approval process is rigorous and dependent on meticulous documentation. As new drugs go through the clinical trial phase, accurately tracking patient usage is crucial. RFID technology can improve the tracking of drug usage throughout the clinical-phase testing protocols. Improved tracking and accountability can improve the reliability and speed of the United States Food and Drug Administration (FDA) drug approval process. Inventory Management Manufacturers and distributors need improved visibility throughout the supply chain to gain an accurate account of inventory. Lack of visibility of customer orders results in increased inventory because healthcare practitioners often keep buffer stocks to avoid stock outs. Increased inventory visibility could reduce buffer stocks by substituting knowledge for inventory, thereby reducing total inventory costs. Hospital and Medical Device Company Applications

MEDICAL DEVICE AND ASSET TRACKING

RFID has strong application potential with medical device companies. The FDA requires medical device companies to be able to identify each unit by serial number. Medical device companies need better control of implants on consignment with hospitals because returns can occur more than 50 percent of the time. RFID technology that improves visibility into returns could enable faster redeployment since the company would know sooner when an unused product could be returned.

Surgical instruments and other devices must be properly cleaned and packaged between uses. Tags on the instruments and readers on the sterilization chambers and storage cabinets can validate proper cleaning and help locate needed instruments. Since medical devices are often mounted on portable carts, smart tags placed on the devices and readers installed in the doorways can enable personnel to quickly locate a crucial piece of equipment and immediately determine its fitness for use.

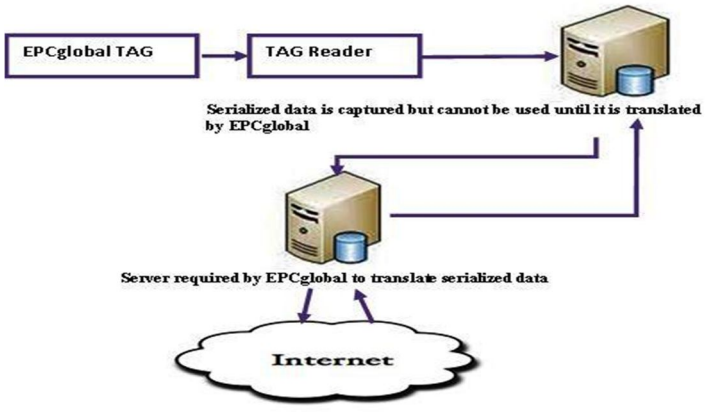

Fig1.System Architecture

II. METHODOLOGY AND FRAMEWORK

One of the fastest growing applications for RFID product tags is to track of the pharmaceuticals and ensure their authenticity. Application of RFID products to solve the

problem of counterfeit drugs will dramatically increase the effectiveness of anti-counterfeiting efforts. This will improve U.S. drug safety. In the medical equipment field, RFID product tags can be used to track and locate medical devices. The use of RFID products on equipment and RTLS (Real time locating systems), enables hospital staff to rapidly locate critical medical devices. When you need a deregulator, you need to locate it fast! This enhances patient safety, and can reduce the amount of equipment investment needed. Additionally these tags can be used to inventory equipment and consumables used in an operation, including scalpels, sponges, clamps and other surgical equipment. At the end of an operation everything can be automatically accounted for. Finally, applying RFID products to assets aids medical institutions in automating inventory management, reducing overhead and minimizing duplicate supplies of critical inventory.this project contains the following methodology.

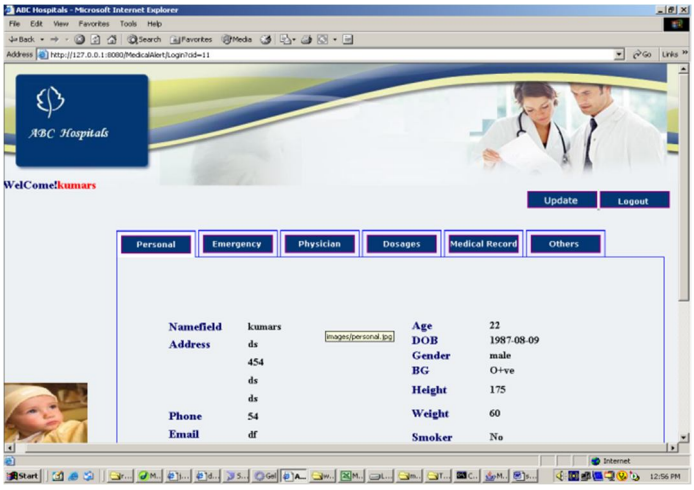

Fig3. .View information of Patient

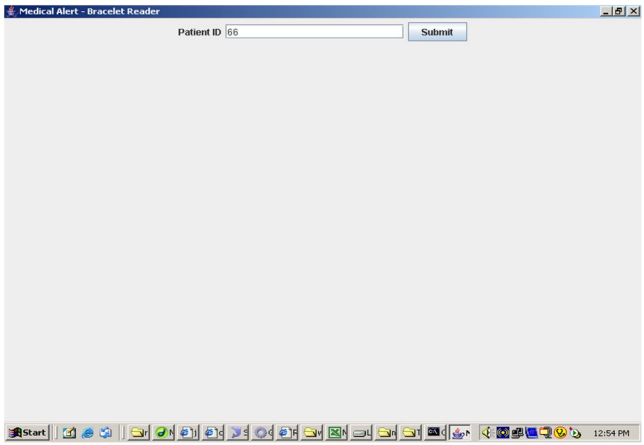

Fig2. Doctor Enter id of patient

1) PATIENT PERSONAL INFORMATION: This module is used to retrieve the personal information that is used in the time of emergency. Personal details contain information regarding the person's name, age sex, habits of the person such as the smoking habit, drinking habit etc.It also contains the information regarding the emergency contacts that is needed to inform the dear and near ones. The personal information can only be updated by the patient. He can do this by providing the password that is user specific. By giving the password in the web browser he can update the personal information. The user only can update the information; no other person has the rights to access it.

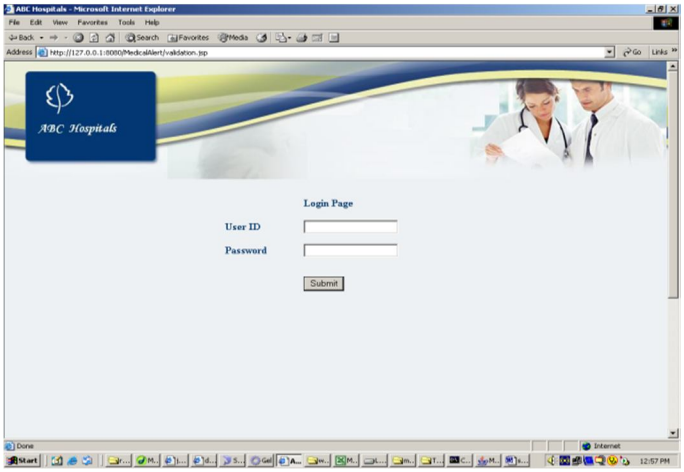

Fig4. Updating by Doctor

2) EMERGENCY CONTACTS: In the second stage, collected literature was classified into several categories based on the proposed research framework, which will be introduced in the next section. With the guide of this framework, we identify why RFID is attractive to healthcare, how it is applied in different areas, and what technologies are used in practice. Meanwhile, research papers that discuss the potential benefits as incentive factors in RFID adoption and barriers that impede RFID implementation are also categorized in this framework.

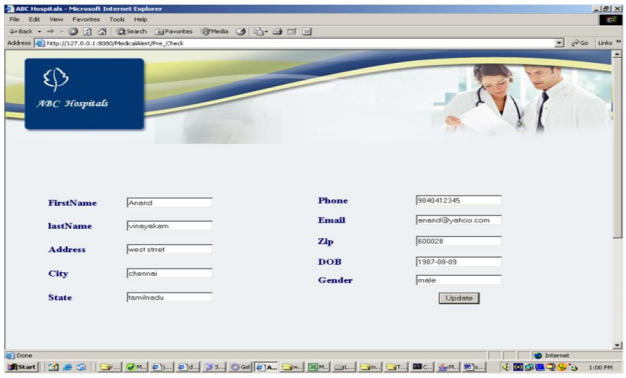

Fig5. .View information of Patient

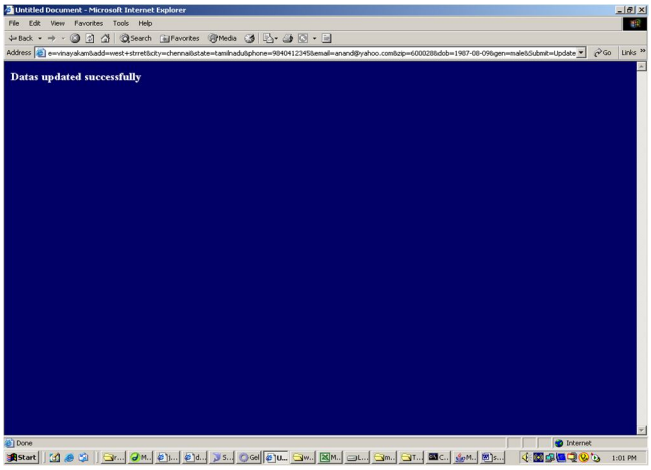

Fig6.Successfully update information

3) PHYSICIAN'S CONTACTS Literature Analysis, Evaluation and Implications: The last phase followed our proposed research framework and conducted detail analysis with regard to the literature. We proposed some useful suggestions and implications (e.g., the most popular application, the perceived benefits and critical barriers) for researchers in this area.

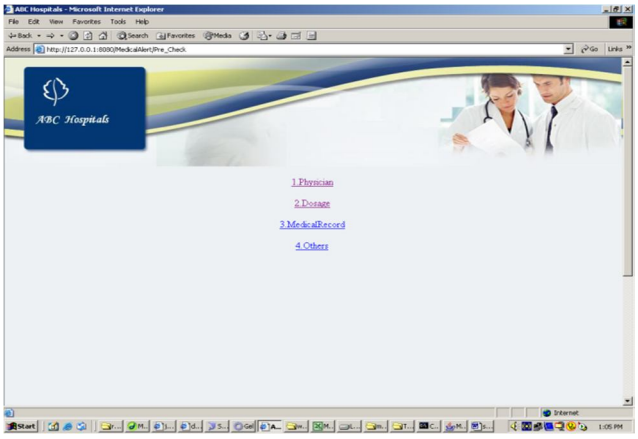

Fig7. view the information

4) *MEDICATION AND DOSAGES:* Depicts the logical process of RFID adoption in healthcare. To better understand how RFID can help improve healthcare practices, we first identify the existing problems and challenges faced by this industry. Then we study how RFID is applied in different application areas to solve or partially solve these challenges. By analysing the research prototypes, pilot studies, and case studies in our collected literature, we identify the benefits and barriers of RFID adoption in healthcare. These implications can be used to guide future research in this field.

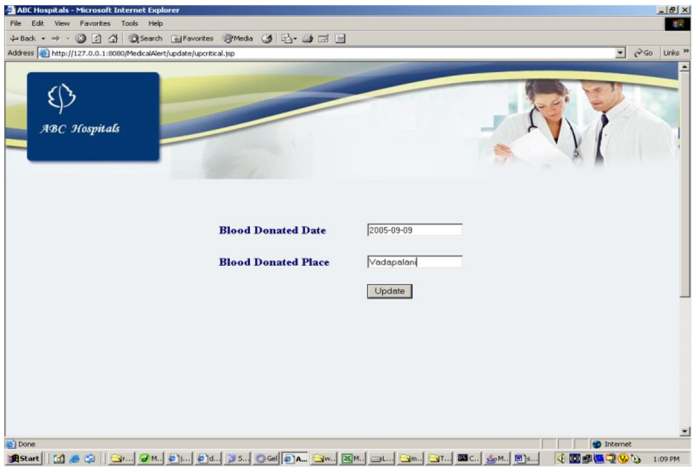

Fig8. Update blood information

Related Work

Although RFID technology is starting to make inroads into healthcare, literature that systematically examines its potential in healthcare is still lacking as compared to those in the retail and the supply chain industry. On the one hand, compared to other technologies such as PDA, RFID is not widely adopted in healthcare. On the other hand, healthcare is a complicated application domain and presents its unique features. A few studies have contributed to literature review in this area. For example, [2] reviewed different ways how RFID systems are being used in hospitals. They focused on the applications and failed to discuss the benefits and barriers. Thus, their study is not very helpful for making adoption decision. In contrast, [3] analysed the potential benefits, implementation challenges and strategies.

However, their review is more industrial oriented and does not follow a formal research framework. Other studies [4]-[6] also gave an overview of the current research in applications of RFID in hospitals but they are not comprehensive. Existing pilot studies and research works were not included. Clearly, there is an urgent need to conduct a systematic review of literature toward RFID applications, benefits and barriers in healthcare. Our review aims not only to provide a state-of-art assessment for other researchers but also to offer a useful guidance for implementing RFID-enabled systems for healthcare administrators.

I. RFID APPLICATIONS IN HEALTHCARE

A. The RFID Technology

The RFID system includes the hardware main components like (tags, readers and antennas) and the software systems. RFID tags can be passive or active, depending on powering techniques. Passive tags can only communicate with the reader when they are sitting in an electromagnetic field of the reader since they do not have battery power; while active RFID tags can power the integrated circuits and broadcast the response signal to the reader.

The RFID reader scans the tag and sends the tag information to the back-end database system that filters, analyses, and stores the data and then passes on useful information to other enterprise application systems for further processing. The database system can have multiple readers located in different places sending data through wired or wireless networks. In addition, enterprise application systems, such as hospital information systems (HIS) and supply chain management systems, can connect to the middleware to retrieve tags information via security protocols. In healthcare, RFID systems are usually combined with other technologies such as Bluetooth, mobile devices, and sensors for different purposes. Passive RFID tags are primary used for patient identification and drug authentication while active RFID tags are mainly used for the tracking purpose.

Barriers to RFID Adoption

Key barriers to RFID adoption stem from previously high technology costs. Payback periods have typically been too long. Companies are waiting for RFID technology to drop in price, thus making it a more affordable investment. Lean information technology budgets mean that new technologies need to demonstrate compelling business cases and short paybacks on investments. Companies are sceptical if the costs cannot be offset by the promised benefits

B. The Needs of RFID in Healthcare

Now a day's hospitals are currently facing challenges of improving patient safety and reducing operational costs, which are often compromised by human and systemic errors. The Institute of Medicine (IOM) estimated that between 44,000 and 98,000 deaths per year were related to medical errors, showing the desperate need to improve the patient safety in U.S. hospitals meanwhile; achieving high operational efficiency in healthcare is another essential goal for organizational performance evaluation. Five problems are identified as the common phenomena that lead to healthcare operation failures including: medical mistakes, increased costs , theft loss, drug counterfeiting , and inefficient workflow.

1) Medical mistakes: Medical mistakes have become a leading cause of death, killing more people each year than AIDS or airplane crashes. The IOM estimated thousands of deaths and injuries are caused by medical mistakes each ood and Drug Administration (FDA) estimated that number to be nearly 500,000.

However, the FDA also estimated that half of the drug error preventable by adopting the appropriate information technologies. Medical malpractice can come from patient misidentification which is recognized as a serious risk to patient safety, adverse drug events, infant missing or mismatch, and accidents like sewn-up of surgical tools inside the patient body after the operation.

2) Increased cost: Now a day's Hospitals are actively seeking solutions to reduce the rising healthcare expenses as well as not adversely affecting patient satisfaction. According to [3], a good health information system could save economy $140 billion a year. That is about 10% of our total health-care

3) Theft loss: Theft loss is estimated that the theft of equipment andsupplies costs hospitals $4,000 per bed each year, which represents a potential loss of $3.9 billion annually with over 975,000 staffed beds in the U.S. [10]. Thus, tracking medical devices, especially expensive assets, is of upmost importance. Besides, some recyclable medical instruments are unnoticed and discarded by the cleaners without medical knowledge.

4) Drug counterfeiting: Tempered or altered products entering the healthcare supply chain is a growing concern [1]. The FDA estimated that up to 40 percent of the medicines shipped from countries such as Colombia and Mexico may be counterfeit, which caused and the society. The pharmaceutical industry reported that it loses $2 billion per year due to counterfeiting drugs. Both consumers and manufacturers are looking for ways to keep drugs safe [1]. Item level RFID tagging is believed to be the best solution against counterfeit drugs.

5) Inefficient workflow: Inefficient workflows exist in every hospital because of the difficulty in allocating resources in real time. For example, doctors and nurses wasted over 30 percent of their working time searching for or reading information about patients . Most medical facilities practiced managing the large number of seriously injured patients expected during catastrophic events. During mass casualty events, as the demands on healthcare teams increase and the challenges faced by managers escalate, workflow bottlenecks begin to develop and system capacity decreases as well .

C. RFID Applications in Healthcare

RFID has been applied in a variety of healthcare practices. We investigated a total of 55 research papers to identify the cutting-edge hospital applications, which is organized in five categories in terms of system functionalities: tracking (16 papers), identification and verification (11 papers), sensing (6 papers), interventions (12 papers), and alerts and triggers (14

papers). Several papers described more than one application so they are analysed in more than one category..

Reference evaluated an infrared/RFID equipment tracking system in a tertiary care hospital and observed increased use of infusion pumps as a result of efficient tracking capability offered by the RFID technology. RFID is moving beyond the perception of being solely an asset tracker and increasingly viewed as a technology that can improve care by tracking vulnerable patients, e.g., elderly dementia patients, children, and newborn. Further, RFID is used to accurately determine the location of victims and staff at the emergency site. Hospital staff tracking is also presented as a prototype. Compared to asset tracking, people tracking is more challenging since it involves patients, doctors, medical know-how and other organizational, privacy and social issues Tracking drugs from creation to receipt is applied in the pharmaceutical industry, to alleviate drug counterfeiting, theft, and misuse of medications. Medicine bottles are being fitted with RFID tags to detect fake drugs moving through the supply chain. Purdue Pharma announced to place RFID tags on bottles of pain reliever OxyContin to protect drug safety besides, RFID is used to track other medical supplies that are sensitive to environment, e.g., blood bag [1] .

1) Tracking: Tracking assets and equipment is the most widely used application in hospitals. Passive RFID tags are used to track telemetry transmitter in Hartford Hospital, Connecticut, USA active RFID tags along with barcode are used to track infusion pumps, beds, and wheelchairs in a 120 bed acute-care hospital, Hospital in Boston, USA used RFID tags to track commonly lost medical items; RFID-based robots were deployed by First Health Moore Regional Hospital, North Carolina, USA to track valuable assets

2) Identification and Verification: Misidentification is one of the major sources of medical errors and it can be reduced by RFID. Positive patient identifications (PPI) applications include using a smart patient wristband that when scanned by a RFID reader reveals patient information such as name, date of birth, admitting orders, insurance information, and the surgical site . A patient identification system has been implemented and evaluated in the University College Hospital in Galway, Ireland, to improve patient safety. It can also support nursing shift exchange to save time and efforts. PPI applications also include newborn identity reconfirmation and disaster victim identification (DVI) The placement of the RFID chip inside victim bodies was proved practical by the Austrian DVI team in Thailand in early 2005.
Beth Israel Deaconess Medical Canter found that a combination of bar codes, passive RFID and active RFID worked well for patient identification in their pilots study. Besides, implantation of an RFID tag into human molars is used in security and access control. ID-based system using RFID technology can also be used for automatic identification of medical articles in hospitals. Mount Sinai Hospital of New York conducted pilots on tagging contrast agent syringes with details on the volume, name, as well as the expiration date of the product; a new specimen-labelling system that uses RFID was proved to be useful in reducing specimen labelling errors in the pathology laboratory; RFID tag-labelled end tracheal tubes have been used for accurate bedside monitoring of end tracheal tube position [36] to reduce health risk to patients. In addition, these specimens can be uniquely and errors.

3) Sensing: An RFID tag can be applied to collecting sensor-derived data and doing computation by extending the RFID include integration with physical and chemical sensors for logistic data logging, and integration with gas sensors for food logistics. Others include temperature sensing humidity sensing, and chemical sensing. In hospitals, temperature sensing makes it very convenient to tract supply; chemical sensing can support advanced medical monitoring. In the future, RFID tags will likely be used as environmental sensors on an unprecedented scale.

4) Interventions: RFID-enabled interventions can provide automated care, improve current procedure, guide pathway, enable automatic data capturing and collaboration, etc. First, automated care is helpful for patients at home, e.g., a self pill-dispenser to help patients take their dose safely, and an assisted living system to support daily activities for visually sighted or brain injured people. Second, RFID interventions can help alter current procedures and automate manual process in hospitals, e.g., automatically determining patient discharge time. Furthermore, one-stop healthcare services enabled by RFID are possible to serve smoothly from registration to examination, treatment, prescription, and next reservation to improve workflow efficiency.

Third, finding pathways for patients in the indoor environment can be accomplished by RFID, such as an indoor navigational system for blind or visually impaired people Reference installed a map information system on a white cane to inform the patient using colored guideline and vibration. An RFID-based navigation system was deployed more than one year of validation.
Fourth, currently data collection in hospitals is done manually. This process is time consuming and error prone.
Fortunately, this problem can be solved by RFID. The Capital Regional Medical Canter in Tallahassee, USA has analysed such data to identify the current hospital functioning status under the scenarios of low or moderate patient load researchers from the simulation community collected data through RFID on a consulting engagement at a hospital Collaborating with HIS, RFID can help build intelligent clinical diagnosis and treatment support system which is applied in Alfred hospital, Melbourne, Australia. Lastly, with the data logged by RFID, hospitals can provide an audit trail of the equipment and staff involved, in the event of an incident with patients.

5) Alerts and triggers: Applications involving alerts and triggers are designed to protect patient from dangerous events

or emergencies during the surgery, blood transfusion, drug administration, hand hygiene monitoring, etc. In the surgical environment, 1,500 objects are estimated left inside patient bodies after surgery each year in the U.S., and two-thirds of them are sponges. To solve this problem, a handheld wand scanning device was proposed to detect sponges inside the patient body a similar experiment was conducted with a detection accuracy of 100% use of gauze sponges with embedded passive RFID tags was tested with an animal and proved useful. RFID applications are examined in surgery and believed to make patient care safer.

During blood transfusion, it is important for a patient to receive the safest blood possible, which is done by tracking the donated blood to guarantee the quality of the blood source. Reference estimated the error rate for blood usage to be one out of 14,000 in the U.S. and suggested adding an RFID layer to the blood safety loop. A prototype adopted a fingerprint sensor with RFID, so as to ensure the process of identifying blood donor more reliable and credible Drug administration can be improved by alerting care providers any critical situation dosage system presented by used PDA to scan the barcodes on the drug package and the RFID wristband carried by a patient, to alert drug mismatch, over-dosage or drug errors; other prototypes for monitoring drug compliance include smart cabinet and smart refrigerator ., home robot based on facial recognition, and an electronic health record synchronized system .

Such applications usually combine RFID with other technologies such as sensor networks, barcode, and text-to-speech technology. Taichung Hospital in Taiwan deployed a drug administration system and showed effective reduction of medication errors . Other uses can include tube and syringe monitoring, hand hygiene monitoring, etc.

II. BENEFITS AND BARRIERS

A. *Benefits of RFID in Healthcare*

RFID adoption in healthcare can not only reduce cost and improve efficiency by tracking asset and people, but also reduce medical errors to improve patient safety and save lives. Table II summarizes the potential benefits that can promote RFID adoption.

Primary goal of applying RFID technology in healthcare is to improve patient safety. First, RFID is a valuable tool for quickly retrieving patient information and monitoring patient location in hospitals so as to improve the accuracy of patient identification and any medication a patient is taking Second, alerting services can identify possible human errors and warn care providers in case of danger. For example, automatic sponge counting by RFID can avoid sponge left inside the patient body [55]. Third, finding the required equipment with minimal delay can save patient life [12]. Fourth, integrating RFID with existing HIS can improve decision making by accessing patient information in real time accurately. Further, RFID-based tracking system can improve personal safety and security by better access control.

2) Time and cost saving: Another critical challenge faced by healthcare is increased costs which can be reduced by several approaches. For example, RFID-based asset tracking and monitoring system can help prevent valuable assets ande equipments from being stolen .Other benefits include improving staff productivity, decreasing equipment rental, and improving regulatory compliance Doctors and nurses in their daily activities can save a lot of time searching for medical devices and can focus on their professional duties.

These improvements can in turn reduce medical costs, as much as $1 million annually for a small-scale hospital.

3) *Improved medical process*: Hospitals want to improve the patient workflow and the operational process so as to save costs and enhance patient satisfaction. With automatic data capturing and storage capability of RFID, manual processes which are typically employed to record data can be automated. RFID has the potential to significantly improve operations by actively monitoring asset and patient flow through the hospital. Besides, the recorded data can be analysed to improve hospital efficiency.

4) Others benefits: RFID technology brings other benefits such as protecting drug supply , improving resource utilization, and enhancing patient satisfaction .

B. *Barriers to RFID Adoption*

Deploying RFID technology in the healthcare industry for promoting patient safety is a complex issue since it involves technological, economical, social, and managerial factors. Table III summarizes the major barriers and findings from collected literature.

1) Technical issues: Technological limitations of RFID can impede its adoption especially for healthcare. First, RFID may interfere with the hospital environment [6]. e.g., medical devices. Second, RFID systems are not always reliable. RFID read accuracy depends on a variety of factors such as tagged object, tag placement, angle of rotation, and read distance. Last, lack of commonly accepted industrial standards prohibits RFID deployment in large scale, including standards of RFID data structure, air-interface, and local interface. Health Industry Business Communication Council (HIBCC) has been working on establishing common standards for healthcare systems.

2) Cost: RFID costs include initial hardware and software costs, training, as well as the continuously high costs of RFID infrastructure maintenance and upgrade. The infrastructure requires not only tags and readers, but also additional servers, databases, middleware and applications. Each passive RFID tag costs approximately 10 cents and active one costs several dollars, compared to 3 cents per barcode sticker. The difference in total cost can be substantial if all equipment and

patients are tagged. In addition, RFID integration with back-end systems and data synchronization networks is needed to make RFID viable. The total cost can be huge.

3) Privacy concerns: The benefits of using RFID in medical settings are achievable only if patients are confident that the data being transmitted will not be misused [80]. When an RFID tag is associated with a patient, it can contain the unique identification number that associates with any type of personal information, such as patient name, gender, home address, and medical history. This information is highly mobile and sensitive. Thus, healthcare organizations should ensure neither personal nor confidential information is transmitted via RFID. Such data should be stored in a secure server in compliance with the Health Insurance Portability and Accountability Act (HIPAA). Besides, to relieve the anxiety of hospital staff and patient, it is important to tell them the purpose of this data collection. However, a 2007 national public opinion survey of 1404 Americans revealed that interest in RFID personal medical technology was positively associated with high levels of trust in others and social supports. Only a small minority were negatively disposed toward such applications. As the technology is regulated by more legislative bodies, public concerns will be alleviated.

A contrasting approach being promoted by EPC global requires placing a fee-based, coded serial number on every RFID tag, which would replace the actual information. Important supply chain information would therefore not reside directly on the tag, but on databases that would be connected via EPC global's network that mimics the World Wide Web. This proposed service, called the Object Naming Service (ONS), would require that variable data such as lot/batch and expiration data be referenced and maintained on databases that would have to be continually accessed via ONS.

V. DISCUSSIONS

In healthcare, RFID has the potential to achieve improvements in both supply chain productivity and patient safety applications. However, the technology is more likely to be successful if evaluated for closed system applications first, where deployment and subsequent changes are within the control of the individual organization.

The introduction of a new technology like RFID often causes a stir of interest and excitement about its capabilities. However, RFID will likely go through a stage where initial enthusiasm is tempered by practical cost-benefit considerations. The outcome of these will be appropriate deployment of the technology. Well-developed standards already exist at different technology levels, including the protocol, communication, and data levels.

Using the existing ISO specifications, data can be encoded to RFID tags to guarantee continuity worldwide. This approach Also ensures that RFID will be able to co-exist with current barcode standards, which will likely be required for the foreseeable future. The ISO-based RFID standard is also independent of technology, so the data structure can be coded to any of the accepted frequencies and protocols under ISO 18000.

Healthcare organizations considering RFID-enabled solutions should carefully address the following questions:

Do you have needs for automatic data capture that bar-coding does not address? Will RFID deliver greater benefits than existing, more mature technologies like bar-coding?

The key benefit of RFID that will deliver productivity and inventory improvements is the ability to read multi ple tags instantaneously. Will your organization benefit from this important feature? If not, then bar-coding or 2-D symbology may present a less expensive alternative. It can provide valuable process-integrated decision support through current medical knowledge. In addition, it can comprehensively use patient data for research and healthcare reporting. Several studies envision the future of an RFID-enabled smart hospital that uses RFID and wireless technology to provide a variety of applications. This will benefit vulnerable people such as the elderly. The top benefit is recognized as improved patient safety and reduced medical errors. Besides, care professionals in their daily activities can save a lot of time searching for medical devices. Also, they have real-time access to patient related data, so they can focus on their professional duties. Other benefits include cost saving, improved medical process, and enhanced patient satisfaction. As the healthcare industry is investing more money and efforts, RFID is expected to be able to help achieve the two goals of reducing costs and improving patient safety.

However, healthcare presents unique challenges for RFID adoption. Major barriers to RFID adoption are identified as prohibitive costs, technological limitations, and privacy concerns. We provide the following suggestions to healthcare stakeholders toward successful implementation of RFID systems.

First, the stakeholder should perform a sound and clear return on investment (ROI) analysis of an RFID project
before implementing it. The main issue is to compare the total costs of implementing a RFID system and the total saving by using this system. The cost saving can come from many sources such as optimized workflow, reduced medical error, and improved service quality. Patient satisfaction and staff productivity should also be evaluated.

Second, RFID performance in hospitals should be tested to rule out technological deficiencies. Several studies have shown hazardous interference between RFID signals and medical equipment. Besides, RFID is not always reliable and 100% accurate. Countermeasures to these problems, such as using middleware to improve data quality or using multiple readers to increase data accuracy, should be carried out to improve the system performance
.

Third, patients and medical staff should be educated about the RFID technology so they have a better understanding on the benefits and possible privacy issues. Fourth, technology vendors should act positively to customize RFID systems for

hospital needs and make it interoperable with existing HIS since hospitals can vary a lot depending on the location, age size, etc. For example, to reduce costs, bar codes and existing wireless network can be combined with RFID technology; to add new features in the future, RFID systems should be designed with the capability of modifying and removing services.

IV.SAMPLE IMPLEMENTATION CODE

```
/*Updation for Personal page*/

import java.sql.*;
import javax.sql.*;
import javax.servlet.*;
import javax.servlet.http.*;
import java.io.*;
import java.util.*;

public class Update_Personal extends HttpServlet {
String cid,fname,lname,add,
int i;
Connection con1;
PreparedStatement st1;
HttpSession ses;
RequestDispatcher dispatch;
ArrayList personallist=new ArrayList();

public void doGet(HttpServletRequest
req,HttpServletResponse res)throws
ServletException,IOException

{

res.setContentType("text/html");
PrintWriter out=res.getWriter();
ses=req.getSession();
id=(String)ses.getAttribute("pid");
pwd=(String)ses.getAttribute("ppwd");
fname=(String)req.getParameter("fname");
lname=(String)req.getParameter("lname");
add=(String)req.getParameter("add");
city=(String)req.getParameter("city");
state=(String)req.getParameter("state");
phone=(String)req.getParameter("phone");
email=(String)req.getParameter("email");
zip=(String)req.getParameter("zip");
dob=(String)req.getParameter("dob");
gen=(String)req.getParameter("gen");

/*DataBase Connection*/

try

{

Class.forName("com.mysql.jdbc.Driver");
con1=DriverManager.getConnection("jdbc:mysql://localhost:
3306/medical","root","password");
String s= "update personal set
firstname='"+fname+"',lastname='"+lname+"',address='"+add
+"',phone='"+phone+"',email='"+email+"',dob='"+dob+"',zip='
"+zip+"',gender='"+gen+"',city='"+city+"',state='"+state+"'wh
ere id="+id+" and password='"+pwd+"'" ;
st1=con1.prepareStatement(s);
i=st1.executeUpdate();


if(i>0)

{
out.println("Datas updated successfully");
dispatch=req.getRequestDispatcher("success.jsp");
dispatch.forward(req,res);
}

else
{

out.println("while updating error");

}

}

catch(Exception e)

{

System.out.println("Database driver not found");
System.out.println(e.toString());
                    }

          }
  }
```

V.CONCLUSION AND FUTUREWORK

We can Possible to Get the Result, using patient id in the Apache Tomcat Web Service. And also we are going to add the emergency contacts of a particular patient. The emergency contacts are provided as a separate tab. This contains the particular person's home address, telephone numbers. The emergency contacts contain the information of minimum 2 persons. RFID can be used to improve emergency communication systems for future disaster situations. It can be implemented in Ines and other hazardous workplaces. Ongoing research will include further experimentation to assess, explore and develop the full potential of the Geo Time visualization tool.

REFERENCES

[1] ANS 2 HIBC Health Industry Barcode Supplier Labelling Standard.
[2] Calvin, John. "Joint Automotive Industry Statement on EPC."
March 2 006.EHIBCC TC,
"ISO powered HIBC RFID solution," January 2004.
[3] EPCglobal Object Naming Service, Version 1.0 – EPCglobal
Ratified Specification. October 4, 2005.
Gaunter, Erich. IBM. Frankfurt, Germany.
Messing, Dr. Olaf. ASICON. Tokyo, Japan.
[4] Niemeyer Stein, Werner. Niemeyer Stein Engineering. Bremen,
Germany.
[5] Oehlmann, Dr. Heralds. "What is a smart label?" September 2002.
[6] Woods, J. "Strategic Planning SPA-23-1513: Prepare for
Disillusionment with RFID." June 29, 2004.
[7] ISO/IEC 18000-x. "RFID Air Interface Protocols."
ISO/IEC 15961,2. "RFID Data Protocol."
ISO/IEC 15963. "RFID Unique Tag ID."
Valider, Guenther. Interactive Logistics Consulting. Milan, Italy.