

PROTECTION FOR NEW BORN BABIES IN HOSPITALS USING RFID TECHNOLOGY

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Abstract - Many hospitals, these days depend on the Information Technology (IT) to achieve perfection in the health services and operation management. The said dependency is because of the ability of emerging technologies to solve the problem of different nature. One of the problems where applicability of the IT can produce revolutionary solution is the cradle kidnapping and swapping of newborns in hospitals. It can be achieved with proper usage of the Radio frequency identification (RFID) technology. The present work is an attempt to explore and then utilize RFID technology in healthcare to protect the newborns in the hospitals from kidnapping and swapping. Apart from implementing a sample case the present work also characterize the RFID system in terms of the different elements that it constitutes (readers, tags, software, and security programs).

Index Terms- RFID, Key Board with Encoder, Voice Chip, Cradle Swapping, Cradle Kidnapping

1.INTRODUCTION

The public hospitals of developing countries are generally very crowded and hence are more prone to cradle swapping and cradle kidnapping. Even in developed countries like United States cradle swapping is one of the major concern. Every year around 1, 00,000 to 5, 00,000 newborns in United States are exchanged (swapped) by mistake, or one out of every eight babies born in American hospitals sent home with the wrong parents. According to a study, out of 34 newborns that are admitted to a neonatal intensive care unit there are 50% chances of incorrect newborns identification only in a single day. In real applications, the biometric traits that are commonly used in different authentication systems are the face, fingerprint, hand geometry, palm print, signature, iris, voice, etc. But most of these practical biometric systems are developed for adults only and may not be a solution with newborns. RFID system is very effective in protection of the newborn in such hospitals. A special designed RFID tags attached with baby and his mother along with tag reader and automated system can manage the above issues.

The key advantages of such systems for health-care delivery may include Precise identification of objects without any physical contact or line of sight, Sensors can also be integrated into RFID, Data stored inside RFID tags can be encrypted, customized and made available as per need, Tags are recyclable and can be made complex to imitation, As a special device is required to read RFID tags and may not be human readable format increases.

2.LITERATURE SURVEY

One of the most prevalent problems in hospitals of India is the infants being abducted or getting mismatched from their respective parents. Thus a smart infant monitoring system based on RFID is proposed in this paper to reduce the potential risks. The smart infant monitoring system can be used in neonatal department in hospitals with

integrated RFID modules. The smart infant monitoring system is composed of:

1. Child monitoring system (CMS)
2. Server Room System (SRS)

One of the biggest problems nowadays in hospital is the new born babies getting abducted and infants getting mismatched due to lack of ability to distinguish between features of an individual infant monitoring system can help. By Organizing and synchronizing technologies like Radio Frequency Identification and Wi-Fi Modules by using these technologies we provide a system which allows the new born babies being monitored every time without interrupting the regular care of the Infants.

In the current scenario, monitoring of the new born infants is done manually. The details of the infant are recorded manually on papers and verification is done by manually checking the records of the infants with their respective mothers. The security and safety of the infants is taken care of manually by the hospital staff by keeping a timely check in the neonatal department. So to increase the safety and minimize the man power, we are developing a system in which infants will be monitored using the RFID based system.

3.PROPOSED SYSTEM

In this project, a switch (is used for baby presence), an RFID reader, a voice chip, and a Key Board encoder are involved in this security system. The reader reads the data or unique code contained in the tag and provides authentication. Here the voice module that we used is an IC APR9600. If we want to lift the infant from the cradle, we need to show the authorized ID card to the RFID reader. The reader will verify the card and ask for the password. The system authentication enables the authorized person to lift the baby. The infant can be accessed if the password matches, otherwise the voice alert will be initiated and SMS

will be sent to the registered mobile number to avoid kidnapping of the baby. We also have the protection to give an alarm if anybody tries to break the system, the vibration sensor will activate the buzzer and alarm.

The present work is an attempt to explore and describe the basic architecture of newborn protection System Using RFID technology. A set of two wristbands of RFID active tag with same ID is used for child and any Attempt of cradle kidnap and swapping. The RFID has been utilized in this method to form detection and protective from new born baby larceny and conjointly we have a tendency to are victimization the GSM to form a message alert. If there is any injury or if the band is within the out of aim the RFID tag. That will intimate to the hold on member within the tag. RFID could be a high frequency reader within the base of air interface protocol normal, its most vary of scan. An energetic RFID system will scan tags from one, 500 feet away or additional because the tag broadcast a proof and also the systems square measure designed for longer-range application. Even inside one style of RFID, but there are often {wide array big selection big vary} of scan range. Then the employment of RFID receiver to form check baby is in safe zone, if the band is cut or broken the sunshine alarm has been manufacture and a message sent to revered people/parents.

Here we have a tendency to victimization the computer code use of JAVA and PHP to induce the small print and store the small print within the tag. The system would have safety features to permit solely licensed ward personnel to control the system. It's planned to implement a technology resolution to sight and forestall larceny of latest born Babies in hospitals. The work leverages RFID to record and track baby's knowledge and identity.

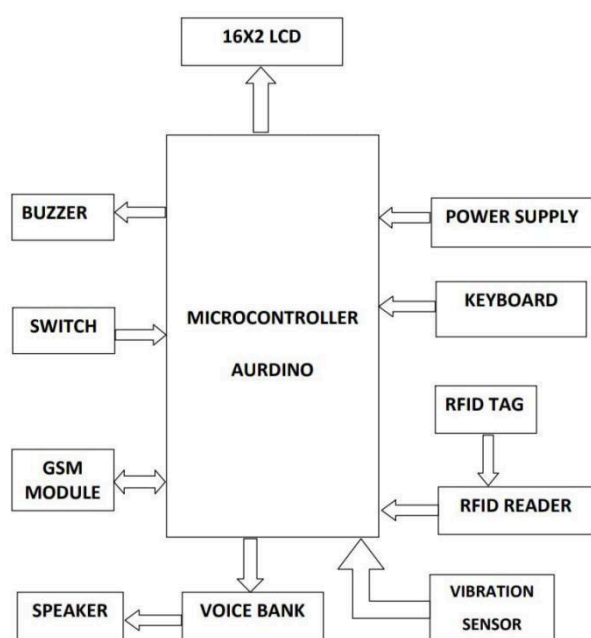


Fig.1: Block Diagram

4.RESULT AND ANALYSIS

The final results of our project “**Protection for New Born Babies in Hospitals using RFID Technology**” are explained as follows

The following figure shows the prototype of our proposed method when the power supply is given:

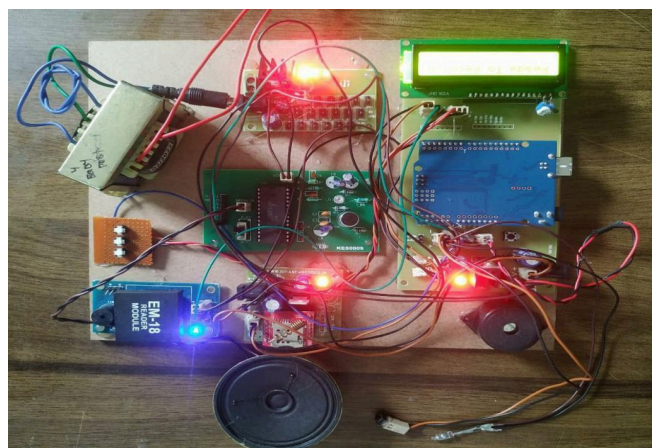


Fig.2: Project prototype kit

When the power supply is given, the GSM module will be activated and after few seconds the LCD will display as the GSM is ready to receive in which the mobile SIM was inserted.

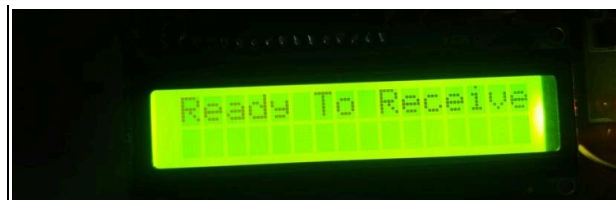


Fig.3: LCD display as the GSM is ready to receive

Now we need to text any text message to the mobile number which is inserted in the GSM with any mobile, then we will receive a text SMS as shown below.

Fig.4: LCD display as sending SMS

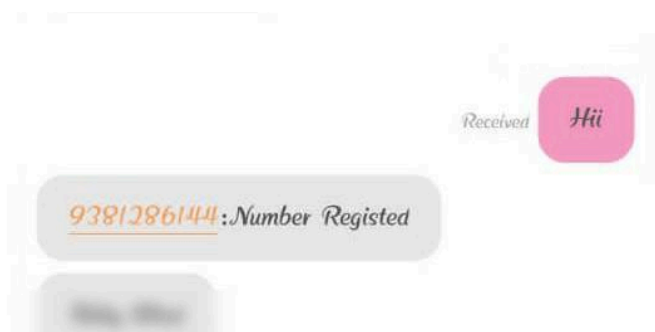


Fig.5: SMS Received

After receiving this message, we need to keep the switch (push to on button) to be pressed ,now show the RFID tag to the reader if the card is valid we need to enter the correct password ,if both card and password matches

then LCD will display as "VALID PERSON" and now switch has to be released which resembles to the lifting of baby from the cradle, we will a SMS AS "Baby lifted.

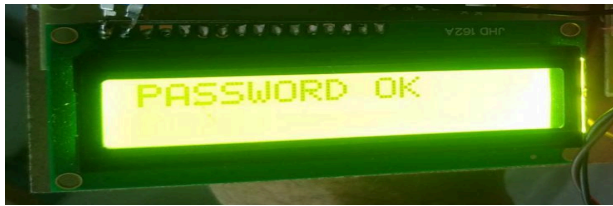


Fig.6: LCD display as "PASSWORD OK"



Fig.7: LCD display as VALID PERSON

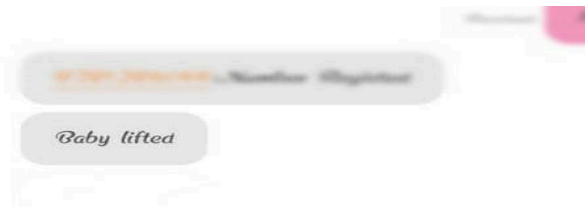


Fig.8: SMS received as "Baby lifed"

If the invalid card is given to the reader or the password entered is wrong then the LCD will display as "INVALID PERSON" and we will receive SMS as "INVALID CARD" and "wrong password" along with we will get an alarm.

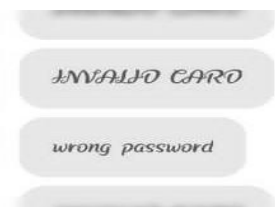


Fig.9: SMS received as "INVALID CARD" and "wrong password"

If the switched is released (which resembles to the lifting of baby) without any RFID authentication and password ,then we will receive SMS as "Baby lifter",but in this case we will get an alarm an buzzer along with SMS.

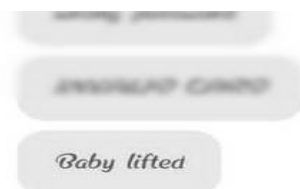


Fig.10: SMS received as "Baby lifted"

5.CONCLUSION

The project on **Protection for New Born Babies in Hospitals using RFID Technology** is working fine, getting the parameter envisaged during the conceptual stage.

During the design, as well as during the construction, greater care has been put into avoid hiccups at the final stage. The PCB layouts were prepared with utmost care to incorporate the circuits in a modular manner. The circuit is made as simple as to our knowledge. Also components were selected keeping in mind their availability and cost. It was a very interesting process of developing the prototype, stage by stage and testing the same. We have to go through fairly large pages of data related to the components etc. It was a useful and fulfilling assignment to get the project completed in time. This gave us a sense of satisfaction and accomplishment.

After testing of the smart monitoring system, following conclusions can be stated that The smart infant monitoring system can detect any unauthorized handling of the infant and keep a check on every infant in the hospital. We can prevent the mismatching of the infants by authenticating them with the details stored in the tag at the time of registration. It is a straight forward way of securing the infants.

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