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# DATAQUEST

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The Business of Infotech

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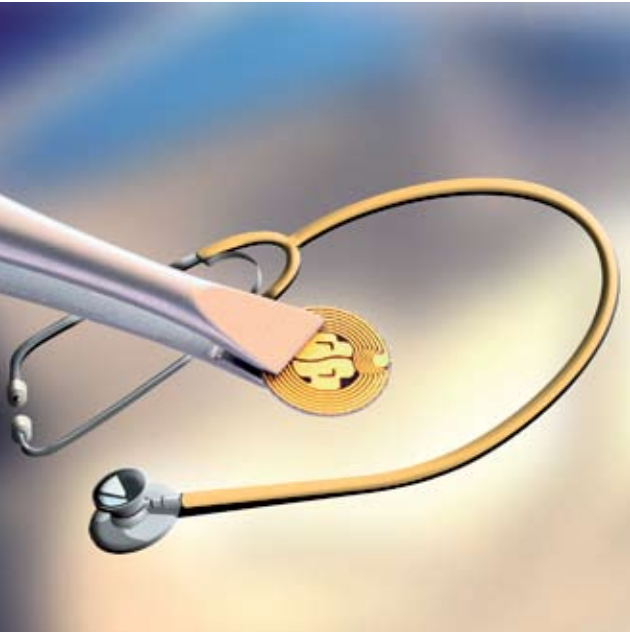
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# Smart Care

RFID wristbands on patients let doctors quickly access medical records, and improve medication accuracy

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**R**adio Frequency Identification (RFID) is a part of Auto Identification and Data Capture technology that was developed during World War II as a tool to identify friend or foe. It has come a long way in the last 50 plus years and is now making inroads into everyday life.

RFID uses radio frequencies to read information on a small device known as tag. RFID tags can be read electronically even when obscured or disoriented. The purpose of any RFID system is to carry data in RFID tags (also called transponders), and to retrieve data by RFID readers wirelessly. The middleware is the brain behind the system and sits between any data collection technology like barcodes, RF, RFID, GPS, SCADA, PLCs, microprocessors etc. The middleware collects and processes the data, which can then be sent to the enterprise application environments like ERPs (SAP, Oracle etc), hospital information systems, BI, CRM, reporting tools etc. The web-enabled solutions allow the information to be accessed and acted upon in real-time from anywhere.

RFID technology can be used for identification and location of tagged items through an electronic label or tag capable of transmitting data. With its traceability, it is a recognized alternative to applications in which the barcode has reached its limit. RFID is now a matured technology and is highly accurate. RFID enabled indoor location systems can provide accurate location information from a few meters for a standard RFID-RTLS (RFID-real-time location systems) to as accurate as 6 inches for the UWB-RTLS (ultra wideband real-time location systems).

Now, how do doctors and nurses in modern hospitals get patients' updated information within seconds? Every patient in modern hospitals is provided with a wristband embedded with a RFID chip, which carries information about the patient, such as name, age, gender etc. Also doctors, nurses and other hospital staff are provided with RFID enabled ID cards, and the equipments and assets are RFID tagged. Since the patients' data is kept securely in the RFID chip or linked to the medical history in the secure hospital database, the doctors

and nurses can quickly identify the patient and get the patient's updated information via their PDAs (personal digital assistant) or tablet PCs at the bedside within seconds in real-time and get rid of the manual paperwork, which would in turn enable medical staff to intensify the level of care given to the patients and to administer treatment easily and safely.

Modern hospitals have many departments and specific units such as intensive care unit, and they are separated from each other with varying degrees of monitoring and care. Within each department (neurology, obstetrics, orthopedics, pathology, pediatrics, radiology, surgery etc) patient records, registration, monitoring information and display information are not generally shared or provided in a common format. In this kind of environment, RFID proves to be a great help for the physicians and the hospital administration.

## Focused Care

Patients are the most important persons in a hospital. All efforts are focused on their treatment, recovery and eventual discharge. Just as the

medical ID bracelets with barcodes have provided positive identification for the patients for years, the new RFID enabled electronic bracelets are used to provide accurate, automatic and real-time identification of the person under medical care. Such an electronic identification system facilitates all the patient information available to doctors wherever they are in the hospital.

The implementation of the patient-care application will improve accuracy for example in administering drugs. This will ensure that the right drug has been administered to the right patient at the right time with the right dosage prescribed by the doctor. It also makes sure that the patient is not allergic to the medication prescribed by the doctor. RFID based integrated operating room solutions also prevent the wrong surgery performed on patients, which can carry very high liability on both the patients as well as the hospitals, and in particular the doctors.

Another very important area for RFID based solutions is the high security neo-natal unit of hospitals, where the newborn babies are tagged immediately with RFID ankle bracelets and associated with the mothers RFID tags, so that babies are not switched accidentally or intentionally. Also, the babies' blood cord can be RFID tagged and saved for later use. Only authorized persons with RFID enabled tags are allowed to visit the neo-natal units.

### Eye on Patients

Measuring and recording vital stats of a patient is a very essential in a hospital. The RFID tags currently have the potential to not only provide identification and location, but also telemetry. In other words, tags equipped with correspondingly low-cost sensors could be attached to the patient and provide continuous measurement of temperature, BP, respiration, EKG, pulse rate, etc at periodic intervals.



This measurement would be transmitted wirelessly to the hospital reader network, where it could be stored to alert the appropriate hospital staff in case of abnormal reading. In addition, the patients are not woken up while asleep for checking their vital statistics.

With a network interface device like PDA, handheld tablet PC and bedside display, the physicians and hospital staff would be assured the most accurate medical information for patients. The doctor can view the patients' past medical history as well as their current vital stats to provide the best care. The doctor can then prescribe a prescription digitally that is instantly sent to the pharmacy to be refilled.

### Tracking Medical Devices

Most medical devices and monitoring systems are installed on portable carts. When these carts without RFID tags keep moving quickly from room to room in a hospital, it becomes difficult to locate them. But, when the electronic tags are attached to carts, monitors and readers at the doorways, they can be traced and located wherever they are enabling quick tracing and retrieving of the cart for treatments. These systems also track the maintenance done on equipments. Also, surgical instruments can be tracked during

surgery to make sure that they are not left inside the patient's body after surgery.

### Making Administration Easy

RFID can help hospital administration to cost-effectively use the resources and optimize the resource value. With the help of this technology, shortage of resources can easily be measured when making future plans for expansion and renovation of the hospital. RFID can impact many other critical areas in the hospitals like out patient department, blood bank, lab, pharmacy, patient records, wards, warehouse, supply chain etc.

Significance of the RFID technology is increasing day by day as medication process and hospital administration is becoming more and more complex. The RFID and related technology will help the hospital management to develop customized solutions by mixing and matching all the available solutions that best fit their needs to provide their patients with the utmost care that they deserve. In the patient point of view, the technology helps making the cost of the healthcare more affordable and providing better medical treatment.

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