

Monitoring system rfid technology

[Technology](#), [Computer](#)



RFID technology which is a matured technology that has been widely deployed by various organizations as part of their automation systems. In this study, an RFID based system has been built in order to produce a time-attendance management system. This system consists of two main parts which include: the hardware and the software. The hardware consists of the motor unit and the RFID reader. The RFID reader, which is a low-frequency reader (125 kHz), is connected to the host computer via a serial to USB converter cable. The Time-Attendance System GUI was developed using visual basic.

Net. The Time-Attendance Management System provides the functionalities of the overall system such as displaying live ID tags transactions, registering ID, deleting ID, recording attendance and other minor functions. This interface was installed in the host computer. Keywords: Radio-frequency identification, RFID technology, radio waves identification (RFID) is a matured technology that incorporates the use of electromagnetic or electrostatic coupling in the radio frequency portion of the electromagnetic spectrum to uniquely identify an object, animal, or person.

RFID chips contain a radio transmitter that emits a coded identification number when queried by a reader device. Some RFID tags can be read from several meters away and beyond the line of sight of the reader. The application of bulk reading enables an almost-parallel reading of tags. This small type is incorporated in consumer products, and even implanted in pets, for identification. The tag's information is stored electronically.

The RFID tag includes a small RF transmitter which transmits an encoded radio signal to interrogate the tag, and receiver which receives the message and responds with its identification information. Some RFID tags do not use a battery. Instead, the tag uses the radio energy transmitted by the reader as its energy source. The RFID system design includes a method of discriminating several tags that might be within the range of the RFID reader. RFID can be used in many applications. A tag can be affixed to any object and used to track and manage inventory, assets, people, etc.

For example, it can be affixed to cars, computer equipment, books, mobile phones, etc. The Healthcare industry has used RFID to reduce counting, looking for things and auditing items. Many financial institutions use RFID to track key assets and automate compliance. Also with recent advances in social media RFID is being used to tie the physical world to the virtual world. RFID in Social Media first came to light in 2010 with Facebook's annual conference. Copyright 2012 SAVAP International www.savap.org.pk www.journals.savap.org.pk 168 with the virtual world.

RFID is a superior and more efficient way of identifying objects than manual system or use of bar code systems that have been in use since the 1970s. Furthermore, passive RFID tags (those without a battery) can be read if passed within close enough proximity to an RFID reader. It is not necessary to "show" the tag to the reader device, as with a bar code. In other words it does not require line of sight to "see" an RFID tag, the tag can be read inside a case, carton, box or other container, and unlike barcodes RFID tags can be read hundreds at a time.

Bar codes can only be read one at a time. Radio frequency identification (RFID) is a matured technology that incorporates the use of electromagnetic or electrostatic coupling in the radio frequency portion of the electromagnetic spectrum to uniquely identify an object, technologies. RFID tags are not an "improved bar code" as the proponents of the technology would like you to believe. An RFID system consists of three components which include: an antenna, a transceiver and a transponder (the tag). The antenna and the transceiver are often incorporated into one reader.

The antenna uses radio frequency waves to transmit a signal that activates the transponder. When activated, the tag transmits data back to the antenna. The RFID can read the tag using Radio Frequency, meaning that the RFID reader can be read from a distance, right through your clothes, wallet, bags etc. An RFID tag consists of unique ID for each tag. The RFID technology has been in existence since the early 1920s. This technology has been used in libraries, museums, race timing, toll collection and contactless payment, tracking of persons and animals etc.

The RFID attendance system is an automatic embedded system used in taking attendance of registered persons in a particular organization. The RFID attendance system offers an organization, the efficiency and convenience associated with RFID technology at a low cost. This method is fast as well as simple. Each employee uses an RFID card and the reader records the data when the employee enters or exits. RFID devices and software must be supported by a sophisticated software architecture that

enables the collection and distribution of location based information in near real time.

A complete picture of the RFID attendance system combines the RFID Tags and readers with access to global standardized database, ensuring real time access to up-to-date information on the card. The card contains a unique identification number called an electronic product code (EPC). Nowadays, there are lots of companies around the world and some of them consist of workers up to 10 thousand or more. To handle a large number of workers may be a problem especially to get the attendance of the workers.

The manual process means that whenever a worker comes to work, he goes to sign at the time officer's table. This manual process has some flaws because in a case where a worker bribes the time officer or is familiar with him, the time officer may tamper with the attendance records. This would be a big problem in the company and might affect the productivity and management of the company. The suitable solution for this problem is by designing a system that will record attendance automatically. In this project, RFID system is used to record the numbers of employees' attendance automatically.

The ID cards of the employees is embedded with RFID tag which is read by a reader. This RFID system is interfaced to a database through a computer. This method is more effective to prevent problem encountered when getting attendance manually. Below is the block diagram of an RFID attendance system. Related Works The use of Radio-frequency identification (RFID) technology in automated electronic environment and for tracking objects has

been widely researched upon by researchers and deployed by various organizations as part of their automation systems.

References [21] and [7] provide examples of a real RFID contact less data link deployments that utilize RFID technology for object tracking and automated data collection solution. RFID is a technology that uses radio waves to transfer data from an electronic tag, called RFID tag or label, attached to an object, through a reader for the purpose of identifying and tracking the object. In 1945, Leon Theremin invented an espionage tool (for spy activities) for the Soviet Union which retransmitted incident radio waves with audio frequency information.

Sound waves vibrated a diaphragm which slightly altered the shape of the resonator, which modulated the reflected radio frequency even though this device was a covert listening device, not an identification device or tag, it is considered to be a predecessor of radio frequency identification (RFID) technology because it was likewise passive, being energized and activated by waves from an outside source. Similar technologies such as the IFF (identification friend and foe) transponder developed in the United Kingdom, was routinely used by the allies in the World War 2 to identify aircrafts as friend or foe.

Transponders are still used by most powered aircrafts to this day. Mario . W. Cardullo was the first to have received the United States patent for an active RFID tag with re-writable memory on January 23, 1973 [4]. In that same year, Charles Walton, a California entrepreneur, received a patent for a passive transponder used to unlock a door without a key. A card with an embedded

transponder communicates a reader near a door, when the reader detects a valid identification number stored within the tag, the reader unlocks the door.

Walton licensed the technology to Schalgel lock of San Francisco, a lock maker and other companies [1]. Time and attendance systems are a major part of today's human resource systems, take organization towards better human resource practice, systems and excellence. The implementation of time and attendance system has a lot of advantages for the manager. The kind of system that is implemented depends upon what the organization is trying to achieve by implementing the system. There are different types of automatic attendance systems; each type of system is suited to different needs and requirements [9].

Some of the most common types include; biometric attendance system, magnetic stripe attendance system, barcode attendance system, and RFID attendance system. Barcode Attendance System The barcode system is a common type of time and attendance system through which the efficiency of measuring and tracking employees' time could be increased to a great degree. With the automation through barcode technology, the errors previously provides high levels of accuracy and reliability in tracking of employee attendance.

In addition, the costs associated with the installation of the system are not too much relative to the cost of payroll or attendance errors. The implementation of the barcode system is easy. Every employee is issued a badge/card in which there is a barcode. In order to check into or out of the

company, the badge/card is swapped on the time clock, and the data is captured by the clock. This data from the clock can be downloaded by the manager or the administrator and then used for updating and maintaining time and attendance records.

The Universal Product Code (UPC) is a unique 12-digit number assigned to retail merchandise that identifies a product and the vendor. The Universal Product Code (UPC) on a product typically appears adjacent to its barcode, the machine-readable representation of the Universal Product Code (UPC). The UPC for a particular product is always the same. The first six digits is the vendor unique identification number. All the products that the vendor sells will have the same first six digits in their UPCs. The next five digits identify the product. The last digit is called the check digit.

This is used to verify that the UPC for that specific product is correct. Each time that UPC is read, typically by a scanner reading the barcode, a calculation is done. And, if the check digit is different compared from the one that is calculated, then the computer knows that there is something wrong with the UPC. Figure 1 is a pictorial diagram of a barcode with its universal product code (UPC) [11]. Copyright 2012 SAVAP International 170 ISSN-L: 2223-9553 ISSN: 2223-9944 9553, Fig. 1 picture of a barcode Biometric Attendance System This is the study of measurable biological characteristics.

In computer security, biometrics refers to authentication techniques that rely on measurable physical characteristics that can be automatically checked. There are several types of biometric identification schemes which include:- face fingerprints, ecked. include: face retina, hand geometry, vein, voice etc.

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The computer uses any of these biometric identification schemes to determine who you are, and based your identity authorize [12]. Under this system, there is time and attendance software that is paired with a time clock for employees which uses biometric technology for authentication purposes.

When these systems are in use, the employees can use their finger prints for clocking in and clocking out. This method has the great benefit that the entire process is easy as well as quick. Other advantages include elimination of the cost previously incurred in getting the employees cards. In the other systems that uses card other (magnetic stripe and barcode systems), there is an ongoing expense associated with the damage, misplacement and stealing of cards and the continuous need for their restoration and maintenance.

Magnetic Stripe Attendance System In the magnetic stripe attendance system, data is encoded in the magnetic stripe of the employee card. When the card, is swiped through the employee time clock, the information in the card's magnetic stripe is recorded by the time clock. This system also reads one card at a time and also requires contact reads with the reader. Figure 2 is a pictorial diagram of a card embedded with magnetic strip. Fig. picture of a magnetic stripe card

Radio Frequency Identification (RFID) A radio-frequency identification system comprises hardware shown in figure 3a & 3b, known as frequency interrogators or readers and tags, also known as labels, as well as RFID software or RFID tags middleware. RFID tags are of two major types, which include Active Tag and Passive Tag. and Fig. sa RFID tag Fig. 3b

RFID card and reader 171 RFID tags can be either passive, active or battery assisted passive. Passive RFID does not use a battery, while an active has an on-board battery that always broadcasts or activated when in the presence of a RFID reader.

Most RFID tags contain at least two parts: one is an integrated circuit for storing and processing information, modulating and demodulating a radio-frequency (RF) signal, and other specialized functions; the other is an antenna for receiving and transmitting the signal. Depending on mobility, RFID readers are classified into two different types: fixed RFID and mobile RFID. If the reader reads tags in a stationary position, it is called fixed RFID. These fixed readers are set up specific interrogation zones and create a "bubble" of RF energy that can be tightly controlled if the physics is well engineered.

This allows a very definitive reading area for when tags go in and out of the interrogation zone. On the other hand, if the reader is mobile when the reader reads tags, it is called mobile RFID. An Electrical Engineering student of the University of Malaysia; Mohd Firdaus Bin Mahyidin designed RFID technology students' attendance system 2008 [10], which only takes attendance of students and stores the information in the database. The block diagram of his project is shown figure 4. However, this system does not incorporate a door unit which allows access to only registered users.

Fig. 4: RFID Technology Students attendance system. Comparing Barcode with RFID is done on table 1 . Table 1: comparisons between Barcode and RFID

	2	3	4	5	6	7
Barcode	Rely on the user to make contact to the reader,					

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hence cannot be read from a distance In Barcode, only one card read at a time is allowed. Embedded information cannot be updated, hence the restriction of the repeated overwriting if the embedded election information for each card It does not allow for the increase technologies like surveillance cameras to be activated with an employee being in the vicinity.

RFID Do not require contact with reader, hence can be read from a distance. Embedded information can be updated; this allows the repeated over-writing if embedded electronic information for each card. RFID has increased technologies like surveillance cameras to be activated in onjunction with an employee being in their vicinity. It is slower and requires time of sight to RFID is faster and does not require line of function. sight. It has lower data storage transponder. It has higher data storage.