Rfid based project

The concept of RFID based attendance cum access control is brought about using a card and a corresponding card reader. The card is a proximity card with a unique identification number integrated in it. The reader reads the data and sends it to the control panel, which is the micro controller. This controller checks the validity of the data with the rom. The control panel checks whether he/she is allowed to enter the particular door or not. Attendance can be checked using keypad.

The employee enters its card number using a keypad interfaced with the controller. The controller again checks it with rom and displays attendance on lcd display. The employees can be permitted in a given entrance as per his/her designation. The access control is employed at this point. When a person of a particular designation is not supposed to be allowed in a given entrance then his/ her card is not found. For each new card to be added a password is required thus checking security. In our project, the card reader is a proximity card reader. The controller used is AT89S52. Whereas the controller was programmed with Hi-tech C.

We have seen the security personnel checking the employees' identification cards at the entrances to avoid illegal entry. The employees sign a register at the entrance before getting in. This is still being practiced in most of the companies.

However, the disadvantages are that, when there is a necessity of providing control at many locations inside the company, a person at each point will not be an economical way of implementing it.

Then came were the punch cards. Employees possess cards, which are punched when they enter into the building. But it had disadvantages. Workers started to practice buddy punching, for their co-workers.

Concerns about buddy punching-the practice where employees fraudulently clock their co-workers in or out to give them credit for time that wasn't actually worked-led Continental Airlines to implement a fingerprint ID system to augment their automated employee time and attendance recording system. The company expanded the system from Control Module after it saved an estimated $100, 000 in the first year. This led to the bar code readers.

It is a much common sight to see a bar code reader in the companies. These are used to check with the employee’s identification. The employees swipe the card in the provided slot. Then the access is given after checking the authenticity of the card. This was a substitute to the security and emerged as a new technique in access control. This acted as a starting to the automation of the access control. But, the bar code readers are contact readers where, the cards are required to touch the readers.

With growth of technology and giant leap in the field of Radio frequency transmission, a requirement for the same application using RF is desired. A further improvement is the RF ID card technology, which uses contact less card readers. Bringing the card nearer to the reader suffices for the reader to read the contents of the card. This simplifies the usage for the employees. This technology is crawling into the companies and has the potential to substitute the preceding technologies.

RF technology is used in many different applications, such as television, radio, cellular phones, radar, and automatic identification systems. The term RFID (radio frequency identification) describes the use of radio frequency signals to provide automatic identification of items.

Radio frequency (RF) refers to electromagnetic waves that have a wavelength suited for use in radio communication. Radio waves are classified by their frequencies, which are expressed in kilohertz, megahertz, or gigahertz. Radio frequencies range from very low frequency (VLF), which has a range of 10 to 30 kHz, to extremely high frequency (EHF), which has a range of 30 to 300 GHz.

RFID is a flexible technology that is convenient, easy to use, and well suited for automatic operation. It combines advantages not available with other identification technologies. RFID can be supplied as read-only or read / write, does not require contact or line-of-sight to operate, can function under a variety of environmental conditions, and provides a high level of data integrity. In addition, because the technology is difficult to counterfeit, RFID provides a high level of security.

RFID is similar in concept to bar coding. Bar code systems use a reader and coded labels that are attached to an item, whereas RFID uses a reader and special RFID devices that are attached to an item. Bar code uses optical signals to transfer information from the label to the reader; RFID uses RF signals to transfer information from the RFID device to the reader. Radio waves transfer data between an item to which an RFID device is attached and an RFID reader. The device can contain data about the item, such as what the item is, what time the device traveled through a certain zone,

perhaps even a parameter such as temperature. RFID devices, such as a tag or label, can be attached to virtually anything – from a vehicle to a pallet of merchandise.

RFID technology uses frequencies within the range of 50 kHz to 2. 5 GHz. An RFID system typically includes the following components:

• An RFID device (transponder or tag) that contains data about an item

• An antenna used to transmit the RF signals between the reader and the RFID device

• An RF transceiver that generates the RF signals

• A reader that receives RF transmissions from an RFID device and passes the data to a host system for processing In addition to this basic RFID equipment, an RFID system includes application-specific software.

The RFID tags based on the mode of operation are classified as Active and Passive tags. The classification is done on basis of the tags ability to transmit the code embedded in it. Hence an active tag is capable of transmitting to a reader independently, whereas the passive tag needs an external excitation for to transmit the code. The reader usually provides the excitation. Further each of the tags either active or passive has their own frequency of operation. We have used the passive type of tag operating at a frequency of 125 kHz in our project.

Tags are manufactured in a wide variety of packaging formats designed for different applications and environments. The basic assembly process consists of first a substrate material (Paper, PVC, PET...); upon which an antenna made from one of many different Conductive materials including

Silver ink, Aluminum and copper is deposited. Next the Tag chip itself is connected to the antenna; using techniques such as wire bonding or flip chip. Finally a protective overlay made from materials such as PVC lamination, Epoxy Resin or Adhesive Paper, is optionally added to allow the tag to support some of the physical conditions found in many applications like abrasion, impact and corrosion. RFID tag IC's:

RFID tag IC's are designed and manufactured using some of the most advanced and smallest geometry silicon processes available. The result is impressive, when you consider that the size of a UHF tag chip is around 0. 3 mm2 In terms of computational power, RFID tags are quite dumb, containing only basic logic and state machines capable of decoding simple instructions. This does not mean that they are simple to design! In fact very real challenges exist such as, achieving very low power consumption, managing noisy RF signals and keeping within strict emission regulations. Other important circuits allow the chip to transfer power from the reader signal field, and convert it via a rectifier into a supply voltage. The chip clock is also normally extracted from the reader signal. Most RFID tags contain a certain amount of NVM (Non volatile Memory) like EEPROM in order to store data.

The amount of data stored depends on the chip specification, and can range from just simple Identifier numbers of around 96 bits to more information about the product with up to 32 Kbits. However, greater data capacity and storage (memory size) leads to larger chip sizes, and hence more expensive tags. In 1999 The AUTO-ID center (now EPC Global) based at the MIT (Massachusetts Institute of Technology) in the US, together with a number of leading companies, developed the idea of a unique electronic identifier code

called the EPC (Electronic Product Code). The EPC is similar in concept to the UPC (Universal Product Code) used in barcodes today. Having just a simple code of up to 256 bits would lead to smaller chip size, and hence lower tag costs, which is recognized as the key factor for wide spread adoption of RFID in the supply chain.