International Journal on Emerging Technologies(Special Issue on NCRIET-2015) **6**(2): 79-84(2015)

ISSN No. (Print) : 0975-8364
ISSN No. (Online) : 2249-3255

Encryption Technique for Identification and Authentication using Radio Frequency Identification Technology

S. Prahallad
Asst .Professor BKIT Bhalki, (Karnataka), INDIA

(Corresponding author: S. Prahallad)

(Published by Research Trend, Website: www.researchtrend.net)

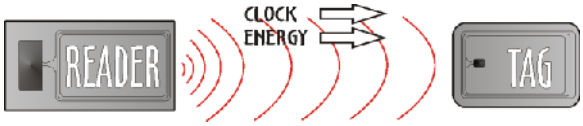
ABSTRACT: Unique smart card application we can solve the problem of carrying separate cards for different purpose i.e. diverse applications can be embedded in s ingle application. The RFID encoding system allows users of RFID systems to generate user cards quickly and easily. The card details for each user are held on the PC in a database e and are managed by the encoding system software. It jus t a prototype and we can develop it into a real time application because we used a object oriented concept s o it can be inherited, modified, easily maintainable. The security concerns of the RFID are taken care with the help of encryption technique. This paper mainly focuses on "security application us in RFID identification "The advantage of RFID is that it's the next solution of bar code readers , its main applications are also with seen in defense organizations.

Keywords: smart card, biometric, RFID

I. INTRODUCTION

Radio frequency identification technology, known as RFID, has been described as “tech’s official Next Big [1]. In RFID systeams, an item is tagged with a tiny s silicon chip and an antenna; the chip plus antenna (Together called a “tag”) can then be s canned by mobile or sstationary readers, us in radio waves (the “RF”)[7]. The chip can be encoded with a unique identifier, allowing tagged items to be individually identified by a reader (the “ID”). Thus, for example, in a clothing store, each particular s unit jacket, including its stile, color, and ssize, can be identified electronically. In a pharmacy, a druggistt can fill a pres creation from a bottle bearing an RFID-chipped label confirming the authenticity of its contents.On the highway, cars with RFID tags on their windsheld’scanmove sswiftly through highway tollbooths, saving time and reducing traffic congestion [1]. At home, pets can be implanted with chips so that lost animals can be identified and returned to their owners more readily. In each case e, a reader must s can the tag for the data it contains and then s end that information to a databasee, which interprets the data stored on the tag. The tag, reader, and database e are the key components of an RFID system [5]. Undemanding what RFID devices are and how they work is critical to an analyst is of the policy issues surrounding this technology [3]. Generic references to “RFID technology” may be applied incorrectly to a wide range of devices or capabilities. Thing.” RFID is not actually a new technology, but it For example, RFID by itself is not a location -is being applied in new ways, spurred by technological advances and decreased costs. Once used during World War II to identify friendly aircraft, RFID is now being used in a variety of public and private sector settings, from hospitals to the highway tracking technology. At s its where readers are installed, RFID may be used to track tagged objects, but this static readability differs from technology ssuch as global positioning sitems, or GPS, which uses a network of ssatellites to pinpoint the location of a receiver. And RFID technology itself can be usedfor a variety of applications, from contactless identification cards that can be s canned no farther than inches away from a reader, to highway s ys tems utilizing “active” RFID tags that can initiate communication with a scanner 100 feet away.[8]

II. BASICS OF RFID



The reader, or scanning device, also has its own antenna, which it uses to communicate with the tag. Readers vary in size, weight, and power, and may be mobile or stationary. Although anyone with access to the proper reader can scan an RFID tag, RFID systems can employ authentication and encryption to prevent unauthorized reading Of data."Reading" tags refers to the communication between the tag and reader via radio waves operating at a certain frequency. In contrast to bar codes, one of RFID's principal dies sanctions is tags and readers can communicate with each other without being in each other's line-of-sight. Therefore, a reader can scan a tag without physically "seeing" it. Further, RFID readers can process multiple items at one time, resulting in a much-increased (again as compared to UPC codes) "speed of read."

TAG: RFID tags are helpful in tracking an individual item through the different locations it moves through. A case in example is the use of RFID systems to move cars through an assembly line. At different stages of the production process, it keeps the computers informed about the next step in the assembly line. An RFID tag can be either active or passive. Passive RFID tags use the electrical current induced in the antenna by the incoming radio frequency scan. This means that the response of a passive RFID tag is brief part of any RFID system is the database where information about tagged objects is stored.

The chip: Usually made of silicon, contains information about the item to which it is attached [3]. Chips used by retailers and manufacturers to identify consumer goods may contain an Electronic Product Code ("EPC"). The EPC is the RFID equivalent of the familiar Universal al Product Code ("UPC"), or bar code, currently imprinted on many products. Bar codes must t be optically scanned, and contain only generic product information. By contrast, EPC chips are encrypted with a *unique* product code that identifies the individual product to which it is attached, and can be read using radio frequency. Thesee codes containthe type of data that product manufacturers and retailers will usee to track the authenticity and location of goods throughout the supply chain. An RFID chip may alsoo contain information other than an EPC, such as biometric data (a digitized image of a fingerprint or photograph, for example).In addition, some chips may not be loaded with information uniquely identifying the tagged object at all; so-called "electronic article surveillance systems" ("EAS") may utilize 3 radio frequency communication to combat sshoplifting, but not to uniquely identify individual items.

The antenna: Antenna attached to the chip is respobile for transmitting information from the chip to the reader, using radio waves. Generally, the bigger the antenna, the longer the read range. The chip and antenna combination is referred to as a transponder or, more commonly, as a tag. Participants at the workshop brought samples of tags currently in use.

Primary Components of RFID Devices RFID devices have three primary elements: a chip, an antenna, and a reader. The pictures below show a common EPC tag that can be affixed to an object (Figure A) and a paper hang-tag that can be attached to individual articles of clothing (Figure).

- Low frequency tags (between 125 to 134 KHz)
High frequency tags (13.56 MHz)
-UHF tags (868 to 956 MHz)
-Microwave tags (2.45 GHz)

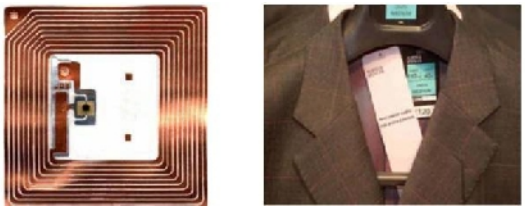
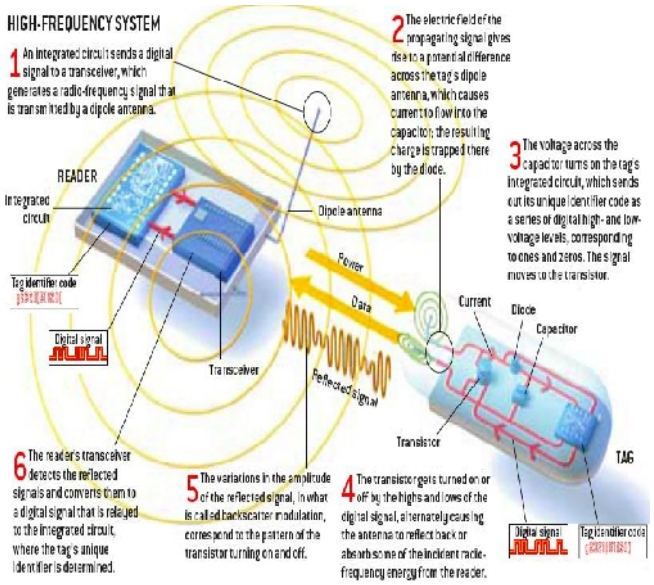


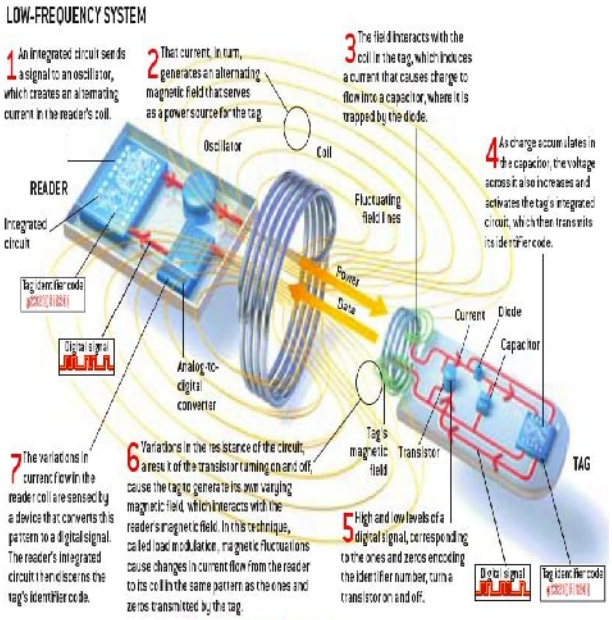
Fig. 1. EPC Tag.

The database: other back-end logistics system, stores information about RFID-tagged objects. Access to both a reader and its corespending databasee are niecessaryl before information stored on an RFID tag can be obtained and understood. In order to interpret such data, RFID readers must be able to communicate with a database or other computer program.

III.TECHNICAL DETAILS OF RFID



RFID technology. A typical RFID system consists of an antenna and transceiver and transponder (RF tag). The transceiver reads the radio frequency and transfers information to a processing device. The transponder or RFID tag is an integrated circuit that contains information to be transmitted. RFID technology[3] uses radio waves for identification. An RFID tag is made up of a chip and antenna. The antenna allows the chip to transmit the information that is used for identification. The reader sends electromagnetic waves, which are received by the tag antenna. RFID technology differs from bar code systems in that it is not a line of sight technology. Bar codes have to be seen and read by the scanner. Besides they do not uniquely identify each item. The RFID technology y works on overcoming this shortcoming of line-of-sight technology. All types of RFID systems use non-contact and non line-of-sight technology. RFID tags can be read through snow, fog, ice, paint and other environmental conditions.



IV. SPECIFIC PRIVACY CONCERNS

RFID tags differ from conventional barcode tags in a number of ways. It is these differences that create the benefit of adopting the technology, [5] while simultaneously creating the greatest concern over the privacy issues involved. For example, under today's barcode technology, a pack of Wrigley's gum sold in Houston has the same barcode as a pack sold in New York City. With RFID, however, each pack would have a unique ID code which could be tied to the purchaser of that gum when they use an "item registration system" such as a frequent shopper card or a credit card. Continuing with the gum example, the purchaser could then be tracked if he/she ever entered that same store again or perhaps more frightening, if they entered any other store with RFID reading capability. Because, unlike a barcode, RFID tags can be read from much greater distances and the reading of such devices is non-directional. This means that if you enter a store with a pack of gum in your pocket, the reader can identify that pack of gum, the time and date you bought it, where you bought it, and how frequently you come into the store. If you used a credit card or a frequent shopper card to purchase it, the manufacturer and store could also tie that information to your name, address, and e-mail. You could then receive targeted advertisements by gum companies as you walk down the aisle, or receive mailings through your e-mail or regular mail about other products.

As the technology behind RFID advances, the potential for privacy infringement [5] does as well. A more recent development is a study which reveals that RFID already has the capability to determine the distance of a tag from the reader location. With such technology already available, it is not difficult to imagine a situation in which retailers could determine the location of individuals within their store, and thus target specific advertisements to that customer based upon past purchases. In effect, that store would be creating a personal log of your past purchases, your shopping patterns, and ultimately your behavioral patterns. While such information gathering would be considered intrusive enough by many consumer's standards, the danger that such information could be sold to other retailers, (similar to the way such profiles are currently sold regarding Internet commerce), could create potentially devastating information vulnerabilities. While some RFID critics have pointed out that the technology could lead to some sort of corporate "Big Brother," there is a more widespread concern that allowing RFID to develop without legal restrictions will eliminate the possibility for consumers to refuse to give such information to retailers.

V. APPLICATIONS

Maintenance: Taking advantage of the read/write capabilities, inspectors can read the maintenance data, update it and reprogram the chip.

Medical information: Printed bar code labels come with RFID tags embedded in them. The tags can be read in unattended scanning environments.

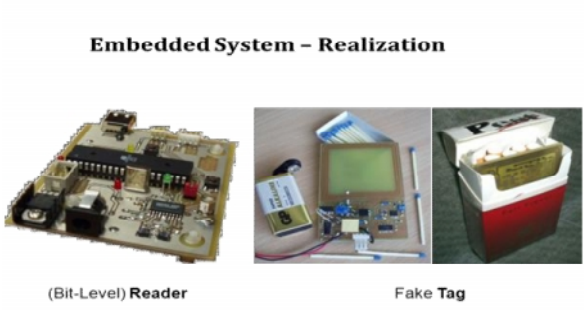
Inventory/Stocking: Several suppliers can walk into a work area to see if the next shipment should go out without relying on paperwork at customer sites to get up-to-date info on quantities needed and pricing.

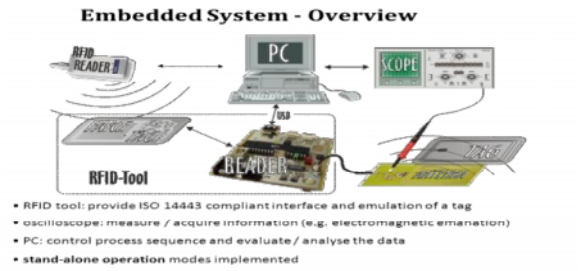
Electronic article surveillance: for apparel and high-end consumer goods. Sensor tags used as antitheft protection.

Retail Checkouts: Enables checkout at kiosks that automatically updates the inventory information in real time.

Handheld Devices: Adding RFID computing to devices will lead to a variety of RFID uses, such as reading utility meters, taking inventory or tracking items through the supply chain.

VI. RESULTS





VII. FUTURE ENHANCEMENT

This is the card which will smash all the cards in the future with its unique nature.

(i) Portable, highly secured card.

(ii) No confusions of too many cards as this single card carry all the details.

(iii) Easy to operate and maintain (A common person can operate easily).

(iv) Since there is no single card available to the society that carry all the information.

(v) This unique smart card will surely create market boom.

(vi) It can be used in the hi-tech cities wherever the checking systems are there and also in colleges (as ID-card), hospitals, Industries (as smart card) shopping malls (for payment) etc.

(vii) Being the first to offer such a card in this corporate world.

(viii) This provides protecting from unauthorized access (as this card is more authenticated) and the customeris more convenient and comfortable with this card to maintain and operate it.

(ix) Bank Account opening, No need to file any paper just swap your and guarantor's card.

(x) During the shopping in your area you have to swap your card and insert the pin for transactions. For this we have to reduce transition charges till 0.5%.

(xi) This card will be our driving license. On this card a picture will be published of authorized driving vehicle. (White car for pvt. and yellow car for commercial).

(xii) Our all the personal records like, height, finger prints and education will be feed on it.

(xiii) Card holder can cast his/ her vote anywhere in India through ATM or any information with the help of this card. (The person will enter its card in voting machine and soon all candidate lists will be available of his/ her locality in touch panel voting machine.

Universal national identity system must include several elements:

1. Total enumeration (assigning unique identity) of the population.
2. Personalizationwhich wouldenable identification through photo and biometric markers.
3. Registration at birth and at 18 years.
4. Data management includes a national register; and Integration with multiple other systems including credit records, government benefits, and voter management. A national identity card could either be delivered through a magnetic stripe card (just like a regular credit card); or better still, through a smart card that contains enough memory and processing capabilitiestorun multiple applications

VIII. CONCLUSION

The whole idea is to include everyone into the System. It provides access to the state benefits to all the citizens who were deprived of the same in the recent past. This number will be issued to everyone right from cradle to grave with no possibly of duplication.

It has been said that India's efforts at giving every citizen an identity number is possibly one of the greatest challenges facing the government. Recently, the Government of India has taken an initiative by forming an organization called "UID Authority of India" headed by Mr. Nandan Nilkeni which will issue a unique identification number to every citizen of India possibly by 2020.Now nobody will be known by name, but by a unique identity number (UIN). Contrary to its name, the much-touted Unique Identification (UIN) project is less about identifying all Indians and tracking illegal immigrants, and more about serving as a common link for various e-governance services and monitoring the implementation of different welfare schemes

REFERENCES

[1] RFID Handbook: Fundamentals and Applications in Contactless Smart Cards and Identification, by Klaus Finkenzeller, John Wiley & Sons (May 9, 2003)

[2] RFID Field Guide: Deploying Radio Frequency Identification Systems, by Manish Bhuptani, Shahram Moradpour, Prentice Hall PTR (February 10, 2005)

[3] The Biometric Consortium. "An Introduction to Biometrics ."July 2005, Available http://www.biometrics.org/html/introduction.html.

[4] United States Government Acountability Office. "Information Security: Radio Frequency Identification Technology in the Federal Government" May 2005. Available http://www.gao.gov/new.items/d05551.pdf

[5] "Creating an RFID Privacy Plan", RFID Journal,May26,2003,http://www.rfidjournal.com/article/view/433

[6] RSA Security Designs RFID Blocker, RFIDJournal,Aug28,2003,http://www.rfidjournal.com/article/view/549

[7] Radio Frequency Identification (RFID) Success Stories: Checkpoint offers proven RFID solutions, Checkpoint Systems Inc,http://www.checkpt.com/content/rfid/success.aspx

[8] Radio Frequency Identification (RFID) – Performa Commercial/Industrial Products, Checkpoint Systems Inc,http://www.checkpt.com/content/rfid/commperf.asp

[9] Jerry Landt and Barbara Catlin, Transcore, "Shrouds of Time: The history of RFID", Published by AIM, The Association for Automatic Identification and Data Capture Technologies , 2001,http://www.aimglobal.org/technologies/rfid/resources/shrouds_of_time.pdf