



International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Website: www.ijirccce.com

Vol. 5, Issue 3, March 2017

Automatic Car Parking Guidance System Using RFID

S. Parthiban¹, P.Madhumitha², T.Kalaivani², D.Lalitha², M.Deepa²

Assistant Professor, Department of Electronic and Communication Engineering, V.R.S College of Engineering and Technology, Arasur, Villupuram, Tamil Nadu, India¹

Final year B.E, Department of Electronic and Communication Engineering, V.R.S College of Engineering and Technology, Arasur, Villupuram, Tamil Nadu, India²

ABSTRACT: Member card can provide personal identification, authentication, data storage, and application processing. It may provide strong marketing media for customer relationship within business organizations. In this paper, the integrated applications of passive radio frequency identification (RFID) and license plate recognition (LPR) are presented. We applied RFID and LPR techniques integrated, meanwhile, we collected the vehicles self-adhered e-Tag ID data. All of these development to compile on the member card as a linking media, it provided the more premium services for card holder. By the cumulative utilization and analysis data of member card, it has become an essential connection between the customers and the companies. It is not only added card self-valued, but also do grasp customers' preference. This proposed system is composed of three main modules at RFID (3M e-Tag), LPR (Image processing), and RFID (NXP MIFARE), respectively. It is designed to meet the requirements of performance and can be generally applied to the commercial markets (e.g., other malls, marts, department stores) that also operate parking lots which face similar problems.

KEYWORDS: Radio frequency identification (RFID), smart member card, e-Tag, motor, GSM

I. INTRODUCTION

For several decades, the various industries have used point-based or cash-back reward incentives as a prime way to build customer loyalty and increase usage of their goods and service. Among these tools or methods, the member card plays a very important role with card members in these business models. Especially, the RFID in the past decade has given rise to various concepts that integrated the virtual and physical worlds. One of the most popular is the Internet of Things (IoT), a vision in which the internet extends into the new form of business models that combine with intelligent networks, cloud and mobile devices. Basically, there are revolutionary changing the way of information applications and services through the advanced wireless techniques. All of these, do make the member card to be an indispensable and important media whether for an individual or commercial group. We are not only approaching such smart environments, we are on its doorstep. The proposed "smart member card" (SMC) is a MIFARE (passive HF/RFID) card that the technology is owned by NXP semiconductors, which was spun off from Philips Electronics in 2006. This MIFARE name covers proprietary technologies based upon 13.56 MHz frequency range with read/write capability contactless smart card standard [1-3]. The SMC holders can take it to enjoy special benefits (included loyalty programs, etc.) in a shopping mall. These cards can be used for identification, authentication and data storage. They also provide a means of effecting business transactions in a special, secure way with customers interaction.

By the card's linking, the company could fulfill a number of tasks such as marketing strategy, planning, activities, etc. The shopping records of card members managed by way of the various central administration systems, or applications which receive or sometime interchange information and configuration settings (point of sale, POS) with the card holders. The managers could collect and analyze the card hotlist, update for application data. Pertaining these consumers real information, and the use of evaluating analytics could help mall managers acquire deeper insight into the value that is being generated from card member. However, the mall managers cannot gain any information, if the



International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Website: www.ijirccce.com

Vol. 5, Issue 3, March 2017

card member does not take any dealing with it. They are only wandering but not triggering the POS or something else. There may be some late in the time of customers' information, if the mall wants to make precise marketing plan. The system presented here. It is an integrated intelligence system included Internet of Thing (IoT), official App, license plate recognition (LPR) [4-6], passive UHF RFID [7] and HF RFID (NXP MIFARE) technical applications through the SMC communicated with the various central administration systems. The integrated system, which could receive or sometimes interchange information and configuration settings with the SMC. It does become a powerful tool for mall managers. There are directly related to the effectiveness of information and applications that are programmed for the exclusive customers and clusters. Individual holders have better security and more convenience with using SMC that perform multiple services

II. SYSTEM DESCRIPTION

MIFARE is the NXP Semiconductors-owned trademark of a series of chips widely used in contactless smart cards. It manufactured for a wide range of contactless IC products with a typical read/ write distance of 10 cm (4 inch) used to comply with the international standard ISO/IEC 14443, which is used in more than 40 different applications worldwide [11]. It is a convenient solution for transport ticketing. But also more other applications rely on MIFARE product technologies, from access to waste management, micropayment, loyalty program to car and bike sharing, smart media and consumer interaction, and electronic identity [12]. MIFARE products are various for application developers that its products available are MIFARE Ultralight, MIFARE Classic, MIFARE Plus, MIFARE DESFire and SmartMX. We decide the specification which is the MIFARE MF1ICS50 (S50) to be used in a contactless smart card according to ISO/IEC 14443 Type A in this paper. The S50 is designed for user convenience. Which could allow complete ticketing transactions to be handled in less than 100 ms. Thus, the card holder is not forced to stop at the reader leading to a high throughput at gates and reduced boarding times onto busses. The S50 card may also remain in the wallet during the transaction, even if there are coins in it. Besides, Several security measures like mutual authentication, data ciphering and message checks support the protection of the system against various attack scenarios.

III. PROPOSED SYSTEM

The SMC (MIFARE ID/ HF) take a communication with the card reader set aside the gate of parking entrance when it enter the mall. In the meantime, the e-Tag reader (mounted on the parking gate and every CZ) can constantly broadcast its signal. When the vehicle adhered by e-Tag (e-Tag ID/ UHF) comes within the reader's range, it receives an electromagnetic signal from reader through the tag's antenna. Besides, upon entry to the parking area, LPR cameras read and catch the same vehicle license plate, these were linked in the vehicle located server. The proposed system works seamlessly by linking every member card and then integrated each data and information into the central administration server. To be identify these exclusive information on the exclusive SMC were used. The following are with an input / output for query.

IV. TRANSMIT MESSAGE TO THE AUTHORIZED PERSON.

A. GSM MODEM.

A **GSM modem** is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone. When a GSM modem is connected to a computer, this allows the computer to use the GSM modem to communicate over the mobile network. While these GSM modems are most frequently used to provide mobile internet connectivity, many of them can also be used for sending and receiving SMS and MMS messages. A GSM modem can be a dedicated modem device with a serial, USB or Bluetooth connection, or it can be a mobile phone that provides GSM modem capabilities. For the purpose of this document, the term GSM modem is used as a generic term to refer to any modem that supports one or more of the protocols.

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Website: www.ijirccce.com

Vol. 5, Issue 3, March 2017

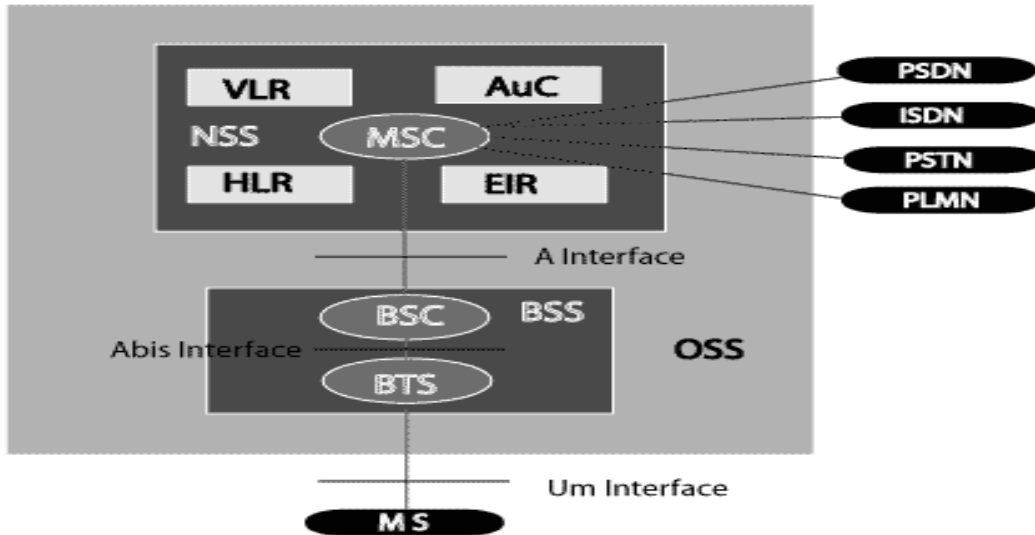


Fig:4.A GSM modem network

GSM network areas:

In a GSM network, the following areas are defined:

Cell: Cell is the basic service area: one BTS covers one cell. Each cell is given a Cell Global Identity (CGI), a number that uniquely identifies the cell.

Location Area: A group of cells form a Location Area. This is the area that is paged when a subscriber gets an incoming call. Each Location Area is assigned a Location Area Identity (LAI). Each Location Area is served by one or more BSCs.

MSC/VLR Service Area: The area covered by one MSC is called the MSC/VLR service area.

PLMN: The area covered by one network operator is called PLMN. A PLMN can contain one or more MSCs.

V. SYSTEM OVERVIEW

The shopper held a SMC (HF/RFID-MIFARE) to take a communication with the card reader and antenna set aside of the gate of the parking area. when he or she enter the shopping mall into the parking lot. The SMC members, meanwhile, drove their cars that adhered the e-Tag. When a car with the e-Tag comes within the reader's range, it receives an electromagnetic signal through the tag's antenna. The reader detects these tag's varying waves and can use these variances to demodulate the code. Upon entry to the parking area, the LPR cameras do read the same vehicle license plate that these data were linked in the vehicle located server. As mentioned above, three processes are used to identify the car its location, car number plate and integrated exclusive SMC member information. One of process is a car's e-Tag (UHF/RFID) function to track the member car, the second process is the LPR technique application to recognize the license plate of car member, and the third process is SMC its MIFARE (HF/RFID)function to collect and identify theexclusive data of the SMC holder through the reader set aside parking gate. All of these data collecting were integrated into the central administration server, and then output the useful information to communicate with query server. The SMC members can not only take the benefits like the loyal program on bonus points accumulated, but also find their cars through a variety of finder interfaces: kiosks, smart phone applications and supported auto-payment stations in mall, as shown in Fig. 2. Secondly, as the CZ laid out, we formulated a space count sign. The mall site with multiple parking CZs (levels) set these signs along entry roads/ lances. The signs displayed a space count for each CZ on the mall parking lot helping drivers decide which one to select for parking. The customers approach a CZ, another sign informs them of space availability. The signs provide very clear guidance for each driver decision reference within

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Website: www.ijircce.com

Vol. 5, Issue 3, March 2017

the CZs. The proposed system from this parking guidance removes strain from the past parking experience, facilitating the parking path from entry to space. The parking process is significantly faster and more convenient.

VI. BLOCK DIAGRAM

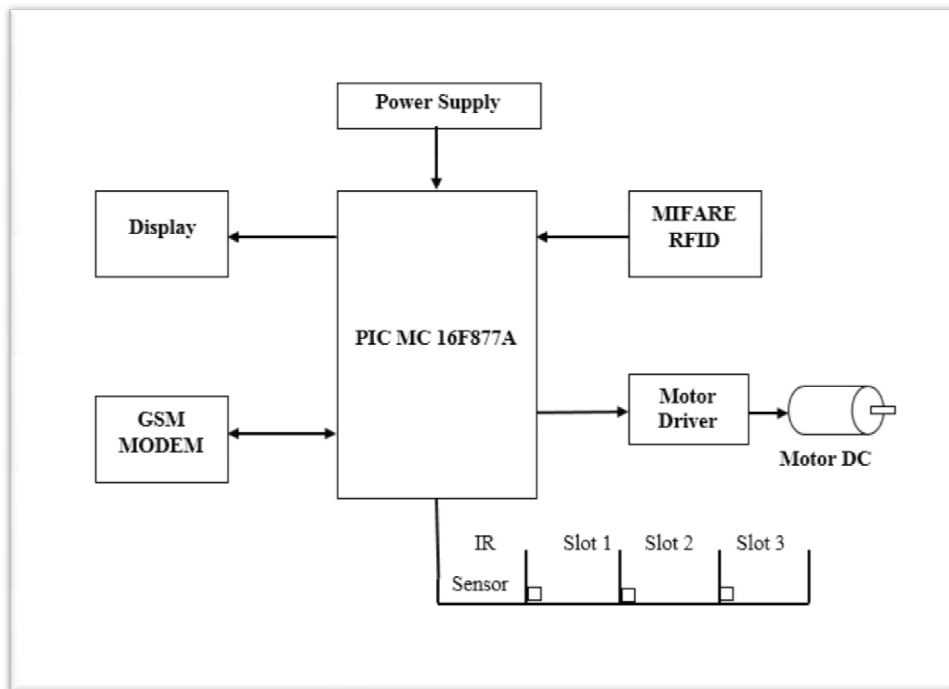


Figure 6

RADIO FREQUENCY IDENTIFICATION (RFID)

Uses radio waves for identification, One form of automatic identification Provides unique identification or serial number of an object (pallets, cases, items, animals, humans) Reader powers passive tags with RF energy

PIC MICROCONTROLLER

PIC Microcontroller is the heart of the complete system. It is actually responsible for all process being executed. It will monitor & control all the peripheral devices or components connected in this unit. The controller here we use will be PIC16F877A family. The code will be written in Visual Basic. This unit require +5VDC for its proper operation.

VII. CONCLUSION

The proposed system is integrated applications of the RFID (HF/ UHF) and LPR technologies. Experimental results also show accurate detection in a prototype lab. The MIFARE ID rate is 99% , the LPR can reach up to 91%, and the e-Tag ID is with a detection of 93%, respectively. The integrated plans greatly enhance the adhesion of the original membership card, make it further to be a SMC. The managers have believed that the goal of marketing is to create as many as new customers as possible. In the business environment of the fast change generation, the mall face intense competition, service provider have to aim at exclusive customer groups who feel so strongly that the managers can best meet their relevant needs. The customer loyalty has also formed to the mall in this moment .

Information is king, through collection and analysis of customer data will give the mall managers the best opportunities to understand and anticipate to the continuous communication that come with the connected consumers.

International Journal of Innovative Research in Computer and Communication Engineering

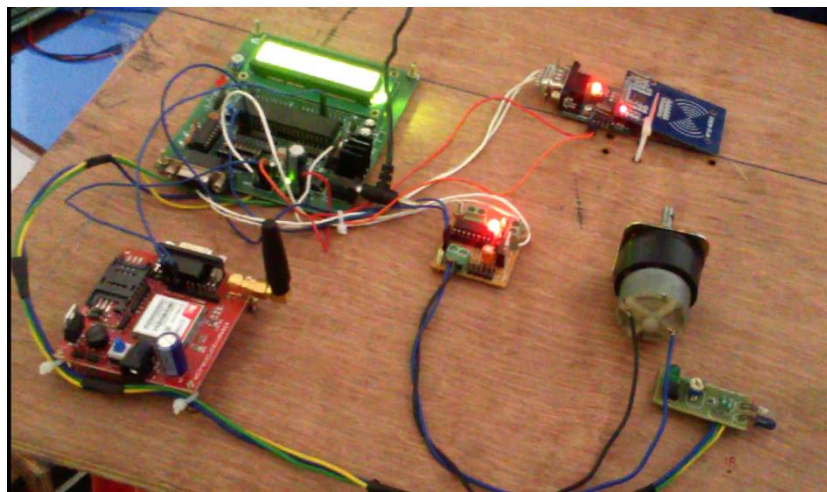
(An ISO 3297: 2007 Certified Organization)

Website: www.ijirccce.com

Vol. 5, Issue 3, March 2017

The SMC can help mall managers to gain deeper insight into the value that is being generated for the SMCs' member, and provide them with more value-added experience desired by the constantly evolving connected SMCs' member. Through the proposed system, SMC is becoming much smarter itself. Consequently, one of the most trendy Internet of Things (IoT) were integrated into the mall construction where is becoming a smart environment .

IX.RESULT



REFERENCES

- [1] MIFARE, "Understanding our brand," unpublished
- [2] MIFARE, "Mifare classic family," unpublished.
- [3] F. D. Garcia, P. Van Rossum, R. Verdult, and R. W. Schreur, "Wirelessly pickpocketing a mifare classic card," IEEE Symp. Secur. Priv., pp. 3-15, May 2009.
- [4] S. L. Chang, L. S. Chen, Y. C. Chung, and S. W. Chen, "Automatic license plate recognition", IEEE Trans. Intell. Transp. Syst., vol. 5, pp. 42-53, March 2004.
- [5] D. Zheng, Y. Zhao, and J. Wang, "An efficient method of license plate location", Pattern. Recognit. Lett., vol. 26, pp. 2431-2438, November 2005.
- [6] L. Gaddam, S. H. Rane, J. K. Baspure, P. B. Gagare, and A. Baviskar, "License plate recognition," Int. J. of Comput. Sci. and Mobile Computing, vol.3, pp. 492-495, September 2014.
- [7] D. M. Dobkin, "The rf in RFID: uhf RFID in practice," 2nd ed., Oxford: Newnes, 2013.
- [8] R. Weinstein, "RFID: a technical overview and its application to the enterprise," IEEE Compute. Society, pp. 27-33, August 2005.