



# International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: [www.ijircce.com](http://www.ijircce.com)

Vol. 7, Issue 2, February 2019

## Intelligent Shopping System Using Li-Fi Technology

Jebaslin Roshiya.J<sup>1</sup>, Keerthika.M.P<sup>2</sup>, Menaga.N<sup>3</sup>, Murugesan.D<sup>4</sup>

UG Students, Department of Electronics and Communication Engineering, Valliammai Engineering College,  
SRM Nagar, Kattankulathur, Tamilnadu, India<sup>1, 2, 3</sup>

Assistant Professor, Department of Electronics and Communication Engineering, Valliammai Engineering College,  
SRM Nagar, Kattankulathur, Tamilnadu, India<sup>4</sup>

**ABSTRACT:** Shopping at malls has become a daily activity in various places. People buy their necessary products and other items in every supermarket and shopping mall by using trolley and baskets. In holidays and weekend we can see the huge rush at shopping mall. It takes time for billing the products and its details. To overcome this, we are developing a system called as Li-Fi Based Automated Smart Trolley Using RFID. Whenever the customer drops a product into the trolley it will get scanned by RFID reader and product details will be displayed on LCD. Then it calculates the total amount of purchasing items and sends the calculated bill to the device attached to trolley. And it also sends the details via headset or speaker. We are using Li-Fi transmitter which will be at trolley which is used to transfer data to main computer. At the main computer Li-Fi receiver which will receive data from transmitter.

**KEYWORDS:** RFID Reader and Tag, Li-Fi transmitter and Receiver, LCD display.

### I. INTRODUCTION

An product with societal acceptance is the one that aids the comfort, convenience, ease and efficiency in everyday life of human. Shopping at mall is becoming daily activity in various places. We can see large number of people go for shopping to malls, supermarkets during holidays and weekends. The crowd will be large especially during when there are offers and discount. People purchase different products in the malls based on their interest and drop them in the trolley. They have to find the product on the list we prepared, to wait in the queue to pay, at the billing section. They have to wait in the queue for long time to get their products payed. It is a time consuming process. To avoid this, we are developing a system which we called as 'LIFI Based Automated Smart Trolley Using RFID'. The method is used to send the product details to the LCD display as well as via headset or speaker. Here we are using RFID tags in place of barcodes. Each and every product has RFID tag. Whenever the customer puts a product into the trolley, it will get scanned by Radio Frequency Identification (RFID) Reader. The name and the cost of the product which is the details of the products will be displayed on the LCD. And it also sends the product details via speaker for blind people. Thus this will be useful for blind people.

### II. RELATED WORKS

Shams H, and Corbett B "Visible light communication by using commercial phosphor based white leds". In this paper, a high speed visible light communication system based on a commercially available high-power phosphor-based white light LED [ ]. A Lobo, E Mukwedeya, T Kgati "Implementation of Wi-Fi Network in Rural Areas Using Windbelt-Cantenna Technology ". In this paper, while such a rapid expansion in telecommunication networks will bring quick economic gains to communities, if not designed in consideration for environmental impacts, the development might result in environmental damage in the form of significant greenhouse gas emissions due to the need to generate electricity to power the expanded network [ ]. Dr. Y.P.Singh, Abhishek Haridas "Critical

# International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: [www.ijircce.com](http://www.ijircce.com)

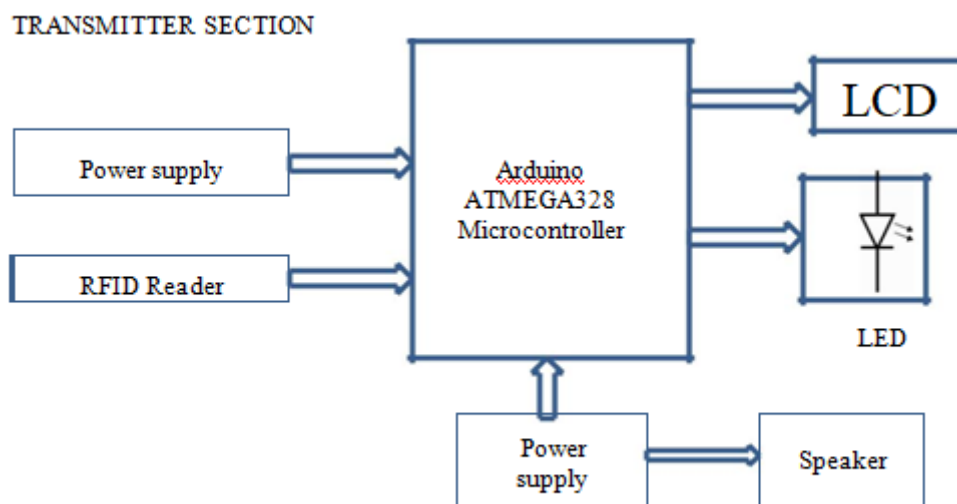
Vol. 7, Issue 2, February 2019

Technical Aspect and Extensive Research Study of the Li-Fi – (a Future Communication)”. In this paper, The Future of Communication (LI-FI) which may not affect all lives. It is the fastest technology as 500MBPS (30GBPS per minute) an alternative, cost effective and more robust and useful than Wi-Fi. The future work of internet is the visible light communication . Dr.Simmi Dutta ,Kameshwar Sharma, Naman Gupta “Li-Fi (Light Fidelity)- A New Paradigm in Wireless Communication”. Here ,The part of spectrum that we can use conveniently is the visible spectrum. The german physicist, Dr.Harald Haas proposed the idea “Data through the Light”.—removing the fiber out of fiber optics by sending data through an LED which varies in intensity faster than the human eye can follow. “New Epoch of Wireless Communication: Li-Fi” by Megha Goyal, Dimple Sapuroo- In this Li-Fi is a wireless communication system in which light is used as a carrier signal instead of traditional radio frequency as in Wi-Fi. Li-Fi is a technology that uses light emitting diodes to transmit data wirelessly . N.Navyatha & T.M.Prathyusha ,

“Li-Fi to LED Based Alternative”. In this Light Fidelity is a branch of optical wireless communication which is an emerging technology. Li-Fi provides wireless indoor communication using visible light as the transmission medium. The bit rate achieved by Li-Fi cannot be achieved by Wi-Fi.

### III.ARCHITECTURE DIAGRAM

In this the power supply is connected to the RFID Reader and the tag is scanned by the RFID reader and it sends the product details to the arduino module.And, the coding is generated using arduino programming.Thus the output is generated in the form of hex decimals.Then the output is displayed in the LCD display and also we can add and remove the products easily since RFID reader doesnot contains line of sight.And then the products are also heard via headset or speaker.The ouput is transmitted by the light waves and it is received by the Li-Fi receiver at the receiver side and it will generate the bill easily.So that we can get the bills in easy and quick way.



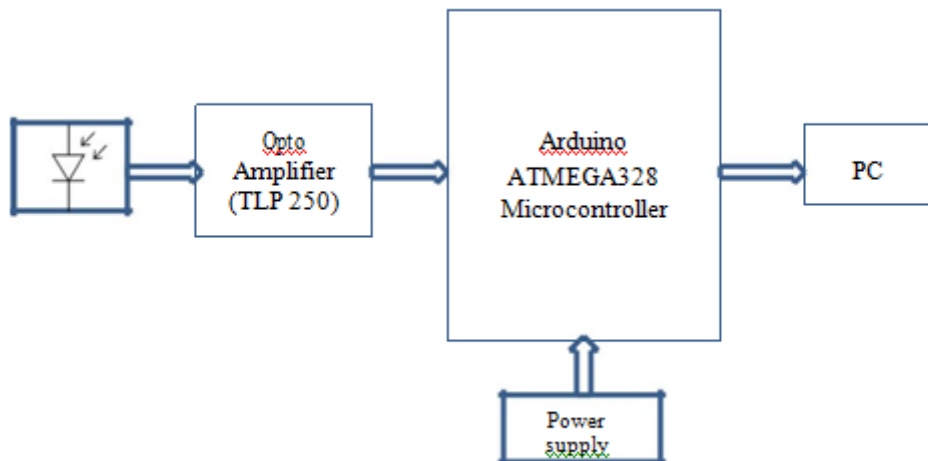
# International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: [www.ijircce.com](http://www.ijircce.com)

Vol. 7, Issue 2, February 2019

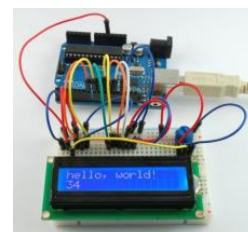
## RECEIVER SECTION



## IV. METHODOLOGY

### INPUT MODULE:

In the input module, all the product in the shopping mall are attached with the rfid tag , for every tag there is a unique number, the tag consists of product name, price,and other details the product. The tag is reader by the rfid reader which reads the data in the rfid tag and the lcd display ,price,display the details of the product so the customer can purchase the item according to the budget.The reader reads the details of the tag and it contains the details in the form of ASCII code and it sends the details to arduino module which is converted to HEX decimal codes.And then it is sent to the computer for further process and the output will be displayed in the LCD display.



### LI-FI MODULE

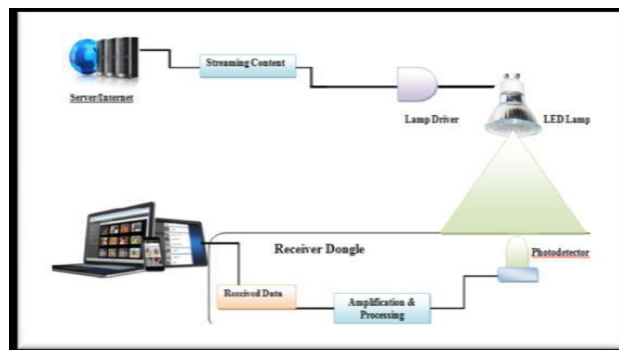
Using Li-Fi module, the details of product are transfer to the li-fi transmitter ,it convert the data into 0's and 1's and transmit to the li-fi receiver. In the receiver section, it consist of photo diode it receives the data and amplify and convert the data into original form and display in the monitor.

# International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: [www.ijircce.com](http://www.ijircce.com)

Vol. 7, Issue 2, February 2019



## OUTPUT MODULE

In the output the bill for the purchase item is generated without scanning the product individually and it can reduce the billing time and reduce the queue in the billing section.

## V.CONCLUSION

Thus the system creates the automatic bill for the purchased items from the trolley using RFID technique and for the visually impaired people it announce the details via speaker. By using this technique increase the security and it is also managed by checking products in trolley and verifying it with billing products. With the use of LI-FI technology, the billing process is being done automatically. The main goal of this system is truly time-saving method and the less consumption of time out of all present billing methods and reduced the manpower in the malls. Different limits of smart trolley like products name, products cost, product weight is continuously display. So this becomes easiest way of the shopping.

## REFERENCES

- [1] Ruchi Garg Department of Computer Application, MTU Noida, [ruchi.garg@globalinst.in](mailto:ruchi.garg@globalinst.in) anveshanam- a national journal of computer science & applications” Li-Fi: Data Onlight Instead of Online “[vol.1, no.1, august 2012-july 2013]
- [2] Jiabin Tuo Haymen Shams Brian Corbett Irish Signals and Systems Conference (ISSC) 2012 at Maynooth, Ireland.” Visible Light Communication by Using Commercial Phosphor based White LEDs”
- [3] Prof. (Dr.) Y.P.Singh, Director, KLS Institute of Engineering & Technology, Chandok, Bijnor U.P. nternational Journal of IT,” A Comparative and Critical technical Study of the Li-Fi – (A Future Communication) V/S Wi-Fi” Engineering and Applied Sciences Research (IJIEASR) ISSN: 2319-4413 Volume 2, No. 4, April 2013
- [4] Jyoti Rani1 , Prerna Chauhan2 , Ritika Tripathi3,” Li-Fi (Light Fidelity)-The future technology In Wireless communication” International Journal of Applied Engineering Research ISSN 0973-4562 Vol.7 No.11 (2012)
- [5] N.Navyatha,T.M.Prathyusha,V.Roja,Mounikanavyareddy94@gmail.com,prathyu.murali123@gmail.com, , “Li-Fi (Light fidelity)-LED Based Alternative” International Journal of Scientific & Engineering Research ,Volume 4, Issue 5, May-2013 ISSN 2229-5518.
- [6] Megha Goyal1 , Dimple Saproo2 , Asha Bhagashra3 Assistant Professor, Dept. of ECE, Dronacharya College of Engineering, Gurgaon, India1, “New Epoch of Wireless Communication: Light Fidelity”International Journal of Innovative Research in Computer and Communication Engineering Vol. 1, Issue 2, April 2013
- [7] Dr.Simmi Duttal , Kameshwar Sharma2 , Naman Gupta3 , Tenzen Lovedon Bodh4 HOD, Dept. of Computer Engineering , Government College of Engineering and Technology, Jammu, India1, “Li-Fi (Light Fidelity)- A New Paradigm in Wireless Communication” International Journal of Innovative Research in Computer
- [8] Dr. Y.P.Singh, Professor, Director, KLS Institute of Engineering & Technology, Chandok, Bijnor U.P., India. International Journal of IT, Engineering and Applied Sciences Research (IJIEASR)- “ Critical Technical Aspect and Extensive Research Study of the Light Fidelity – (a Future Communication)”, ISSN: 2319-4413 Volume 2, No. 9, September 2013
- [9] A Lobo, E Mukwedeya, T Kgati, K Guobadia, B J Dega, R K Gomashi, Q A Kester, M Emmanuel B 01/2010 A Mathematical Theory of Communication By C. E. SHANNON “Implemented the Wi-Fi Network in Rural Areas Using Windbelt- Antenna Technology” Reprinted with corrections from “The Bell System Technical Journa”1, Vol. 27, pp. 379–423, 623–656, July, October.



ISSN(Online): 2320-9801

ISSN (Print) : 2320-9798

# International Journal of Innovative Research in Computer and Communication Engineering

*(A High Impact Factor, Monthly, Peer Reviewed Journal)*

Website: [www.ijircce.com](http://www.ijircce.com)

Vol. 7, Issue 2, February 2019

- [10] Shilpa Choudhary 1, Dolly Kumari 2, Supriya Goel 3 Department of Electronics Engineering<sup>1,2,3</sup> Research Scholar, Jai Narain Vyas University, Jodhpur, India, "New Lighting Technology LI-FI"- International Conference on Advances in Engineering, Technology & Management (AETM), ISBN- 978-81-927182-4-8
- [11]E. Mugler, M. Bensch, S. Halder, W. Rosenstiel, M. Bogdan, N. Birbaumer, and A. Kubler, "Control of an Internet browser using the P300 event-related potential," *Int. J. Bioelectromagnetic*, vol. 10, no. 1, pp. 56–63, 2008.
- [12]M. Bensch, A. A. Karim, J. Mellinger, T. Hinterberger, M. Tangermann, M. Bogdan, W. Rosenstiel, and N. NessiBirbaumer, "An EEG controlled web browser for severely paralyzed patients," *Comput. Intell. Neurosci.*, vol. 2007, pp. 1–5, 2007.
- [13]B. Rebsamen, C. Guan, H. Zhang, C. Wang, C. Teo, M. H. Ang, Jr., and E. Burdet, "A brain controlled wheelchair to navigate in familiar environments," *IEEE Trans. Neural Syst. Rehabil. Eng.*, vol. 18, no. 6, pp. 590–598, Dec. 2010.
- [14]J. d. R. Millan, R. Rupp, G. R. Muller-Putz, R. Murray-Smith, C. Giugliemma, M. Tangermann, C. Vidaurre, F. Cincotti, A. Kubler, R. Leeb, C. Neuper, K.-R. Muller, and D. Mattia, "Combining brain– computer interfaces and assistive technologies state-of-the-art and challenges," *Frontiers Neurosci.*, vol. 4, pp. 1–15, 2010.