iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 7 **Issue:** IV **Month of publication:** April 2019

DOI: https://doi.org/10.22214/ijraset.2019.4352

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887
Volume 7 Issue IV, Apr 2019- Available at www.ijraset.com

RFID Technology and its Applications

Mr. Mohd. Ebaad Qamar[1], Mr. Devendra Kumar Pandey[2], Brijesh Kumar Dubey[3]
[1]*Scholar, Department of Electrical & Electronics Engineering, PSIT, Kanpur, Uttar Pradesh*
[2, 3]*Assistant Professor, Department of Electrical& Electronics Engineering, PSIT, Kanpur, Uttar Pradesh*

Abstract: ***Radio Frequency Identification (RFID) is one of the most exciting techniques. the aim of this Paper is to analyze RFID technology and its applications. This paper gives a brief information Principles of RFID, tag and classification of readers, use of frequencies, current application, as well as the advantages and limitations. The objective of this letter is to analyze the current development and future realm technology.***

A smart meter helps the consumer to know the power consumption of equipment in his respective houses. The objective of this research work is to measure and analyze power consumption by using a smart meter data by conducting case studies on different homes. In addition to saving electricity, smart meter data shows the behavior of devices in the behavior of consumers. Because the power consumption is increasing in the day because the consumption pattern should be given more attention to understanding that the consumption and analysis of consumption is required over time. In the case of developing countries, the technology to employ smart power meters is still unaware of many common people and power utilities. Therefore, there is a great need to save energy by installing these meters. Considering the behavior of consumers, reducing energy expenditure and its correlation with power spot prices have led to this research. The method used to analyze the outcome of this study has been demonstrated using case analysis, ARMMA model XLSTAT equipment and a flattening technique. Based on the valuation results provided in research, the hypothesis is achieved to change the behavior of consumers when they have better control over habits.

Keywords: Advanced Meter Infrastructure, Power consumption patterns, Smart Meters, Smart Metering, ARIMA models.

I. INTRODUCTION

Radio Frequency Identification (RFID) is a common term for those technologies that use radio waves to automatically identify people or objects from hundreds of feet to hundreds of feet. This is an automatic identification technique by which an object can be automatically detected. Barcode, IC Card, Optic Character Recognition , Voice Recognition. are also recognizable technologies. RFID technology uses automated data capture system which helps in improving system efficiency. The combination of tag and reader is used for identity purpose. A code is stored in the RFID tag and the tag is connected to the physical object. Now the object becomes unique identifiable. Then object the communication code from the tag. This way the reader gets information about the object. RFID is not really a new technology, but it is implemented in new ways, RFID is a fast growing technology. RFID offers more benefits on conventional identification tools such as barcode. To read the barcode, the barcode scanner should be in the line of sight with the label. This means that a manual movement of objects or scanners is necessary. On the other hand, FIID can read data without tag of any sight. No alignment is also necessary in RFID technology, provides a brief overview of RFID technology.

RFID has high reading speed and it can work in the presence of obstruction. This technique is more effective when the ability to carry long reading range, faster scanning and flexible data is essential. RFID systems have been given maximum attention in many areas like manufacturing companies, agriculture,

II. STUDY PREREQUISITES

The important prerequisites contributed in our research work are as follows: The analysis of hourly measurement data of 16 households is necessitated while employing data.

Efficient knowledge on a calculation tool such as ―Microsoft Excel is required to execute statistical calculations while evaluating the graphs.

A. RFID Components

In early years, electricity is available only to a specific section of affluent society. The advancement in technology over time encouraged meeting the demands of common people in all parts of the world. The history of electricity meter is well connected involving researchers from past. [5] The general usage of electricity in the early 1870‘s is only confined to telegraphs and arc lamps. With the invention of the electric bulb by Thomas Elva Edison, the power energy market became widely opened to the public in the year 1879. Oliver B. Shallenberger introduced his AC ampere hour meter in the year 1888. Eventually, the progressive development in metering technology leads in enlightening the lives of many common people

©IJRASET: All Rights are Reserved

1) *RFID Technology:* Electric appliances that can detect energy as the reading and can display them are called electric meters. Traditional meters are used in the late 19th century. They exchange data between electronic devices in computerized environments for both power generation and distribution.



Figure 2.1.2 RFID Applications

B. Practical Usage

The modern development in the smart grid power grid is. Recent electrical grids are becoming weak in relation to the electrical load variation of the equipment indoors. The increase in the population also indicates the electrical grid is getting more delicate. The higher the population, the higher the load on the grid.

C. Smart Meter

Smart Meter is an environmentally friendly energy meter that is used for measuring the electrical energy in terms of KWh (Kilowatt - hours). It is simply a device that affords a direct benefit to the consumers who want to save money on their electricity bill. [6] They belong to a division of Advanced Meter Infrastructure and are responsible for sending meter readings automatically to the energy supplier. A simple picture of a Smart Meter is shown below.



Figure 2.2 Smart usage

D. Power Consumption

The total amount of electricity consumed in a personal house is known as power consumption. Power consumption is an important aspect of power supply. People should be aware of how to preserve energy for future use. With daily use of electricity, energy patterns are gradually changing. [7] This variation of consumption patterns can be due to the weather conditions or the unnecessary use of electricity by the residents, such as the increase in equipment in the respective houses and the careless attitude of use do not stop the lights or television for example. These factors can show more impact on the end user. Since the power supplied by energy companies is huge, most people are ignoring energy and its savings.

©IJRASET: All Rights are Reserved

E. RFID Components

1) RFID Reader: Third component of RFID system is RFID reader. The reader sometimes called an interrogator or scanner sends and receives RF data to and from the tag via antennas. A reader may have multiple antennas that are responsible for sending and receiving radio waves. Reader informs data processing system about presence of tagged item. It consists of three main parts: control section, high frequency interface and antenna. Read range of reader is affected by number of factors.Table 2: Classification of RFID reader



Figure 2.6 RFID tag pictorial measuring electrical appliance



Figure 2.7 RFID operational flow

Three graphs for consumption, price-cost and cumulative cost on a particular day of a household, which are interesting for some specific reasons, are shown below. This is the first step of evaluating multiple graphs for further references

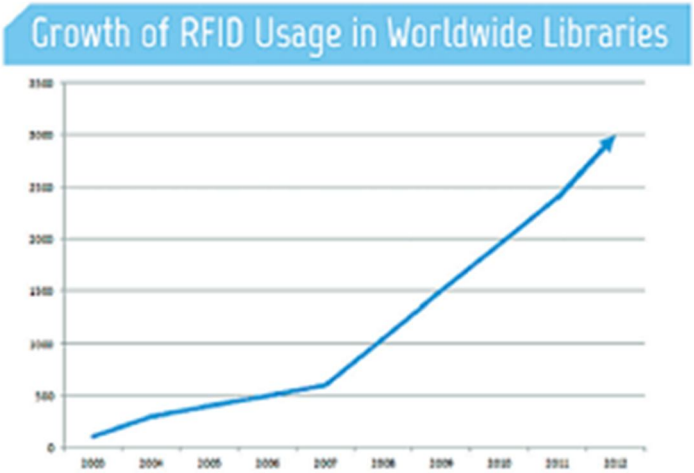


Figure 2.8 worldwide usage of RFID Technologies

©IJRASET: All Rights are Reserved

III. DISCUSSION

With all the obtained data from the statistical analysis, the following results are implied:

A close inspection is carried out from the received data and the results confirm that the use of electricity by most homes is less during the beginning of the month and at the end of the month. Nevertheless, it strongly demonstrates the real characteristics of people's approach towards electricity.

Graphs are generated to state the performance and analysis of 10 households for consumption, pricecost and cumulative cost. [9] The patterns of graphical analysis suggest consumers to serve a competitive nature among them. With the computation of price-consumption correlation results, we can observe that more negative the correlation, the lower will be the cost while as more the positive correlation higher will be the cost if hourly pricing was applied.

Several models were observed and a precise selection is done on the basis of goodness of fit statistics. An idea and a methodology of using seasonal ARIMA for predicting future electricity prices and cost have been proposed. [10] Resource utilization can be effectively improved with the observation of distributed statistics. The unstable behavior of users is noticed and compared from the prediction analysis. Best fitting graphs are shown in the analysis. The graphs generated for this analysis can bring people to adopt changes requested in the paper.

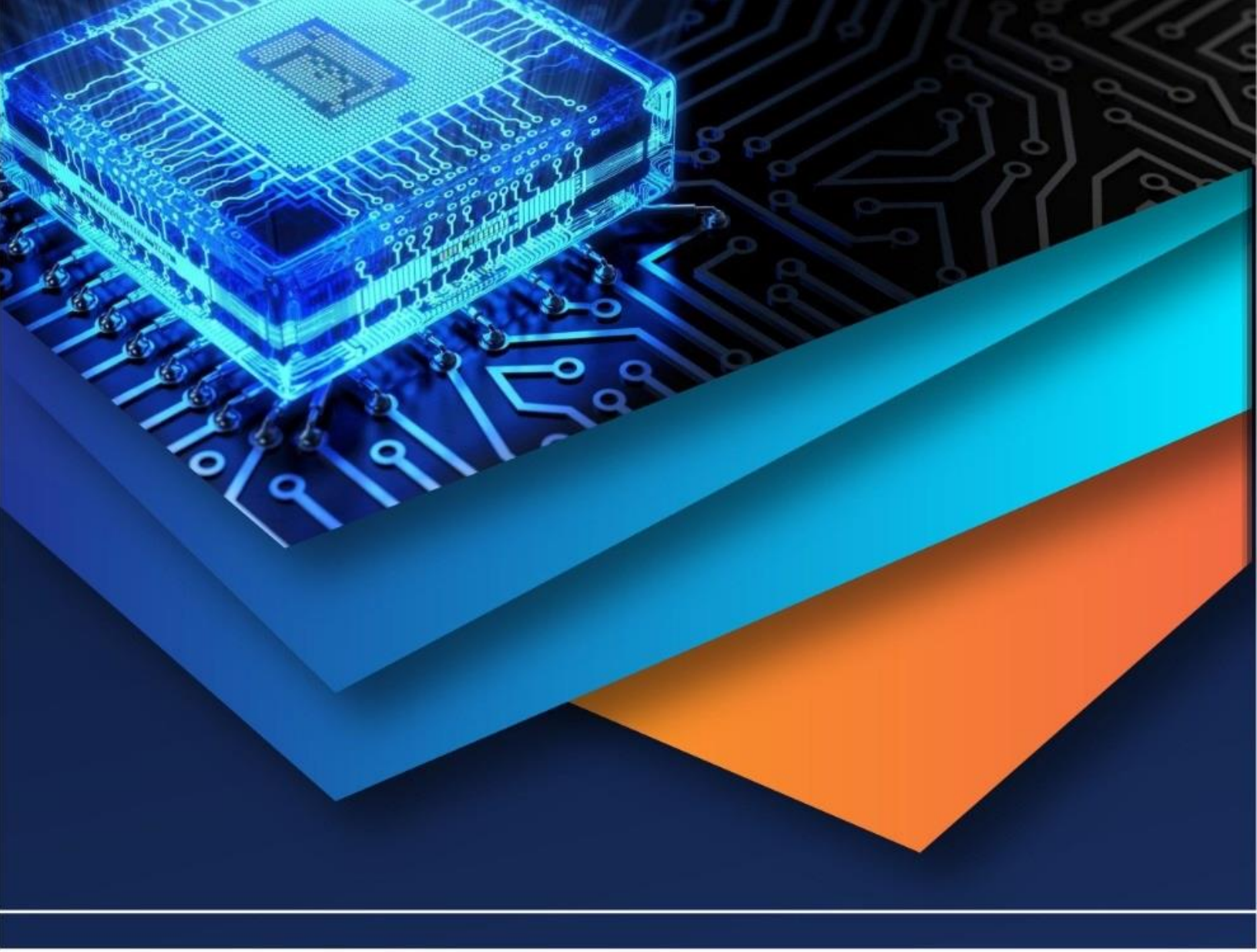
IV. CONCLUSION AND FUTURE WORK

In this review work, we analyzed and interpreted different sets of consumption data of various households and their daily behavior patterns are graphed. We suggested their subjected patterns should be altered with respect to the forecasting techniques discussed in this paper. The proposed models and the study in this research can also encourage users to shift their consumption and optimize the cost constraint.

REFERENCES

[1] Sam Polniak, “RFID case study book: RFID application stories from around the globe” Abhisam software, 2007.
[2] A. Kumar, D. Parkash, M.V. Kartikeyan, “Planer antennas for passive UHF RFID tag,” Progress in Electromagnetics Research, Vol 91, pp. 95–212, 2009.
[3] The RFID Technology and ITS Applications: A Review J. Momoh, “Smart Grid Design for Efficient and Flexible Power Networks Operation and Control”, Power Systems Conference and Exposition, 2009. PSCE '09. IEEE/PES, Mar. 2009, pp. 1-8, doi:10.1109/PSCE.2009.4840074
[4] H. Farhangi“The Path of the Smart Grid”, IEEE Power &Energy Magazine, vol. 8, no. 1, Jan. 2010, pp. 18-28
[5] R. E. Brown, “Impact of Smart Grid on Distribution System Design”, Power and Energy Society General Meeting-Conversion and Delivery of Electrical Energy in the 21st Century,2008 IEEE, July.2008,pp.1-4,doi:10.1109.PES.2008.4596843
[6] S. N. Singh, “Electric Power Generation, Transmission and Distribution”,2nd ed. PrenticeHall of India Private Limited, 2003.
[7] Kamran Ahsan, Hanifa Shah and Paul Kingston, “RFID Applications: An Introductory and Exploratory Study,” IJCSI International Journal of Computer Science Issues, Vol. 7, Issue 1, No. 3, January
[8] Kashif Ali and Hossam Hassanein, “Passive RFID for ntelligent transportation systems,” 6th IEEE Consumer Communications and Networking Conference, CCNC 2009, January 10 - January 13, 2009.
[9] M. Mahmood, Aamir, and M. I. Anis,”Design implementation of AMR Smart Grid System,.

©IJRASET: All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)