

IOT BASED SMART ENERGY METER (REVIEW)

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Abstract:

According to the market requirements of Energy Meter there is necessity of smart Energy Meter. . Nowadays the system will use Zig Bee system for communication protocol. This aims at resolving the shortcomings of the technology of the traditional Energy Meter Reading, by combining the characteristics of the ZigBee technology. The live metering system is designed to make the prevailing electricity billing system simpler and efficient There are more chances of manual error, delay in processing, tampering of the meter and misuse of the Electricity by other sources.

Keywords — Meter, Zig bee, low cost, IEEE, AVR

I. INTRODUCTION

In Maharashtra, there are more than crore meters for electricity that are read every month, at a cost in salaries, transportation and other expenses that tops Rs. 3848.4crore (2006-2007) . A meter-reading system would still require someone driving by every meter and getting a reading through a hand-held receiver, but even newer technology - called an automatic meter reading system (AMR) - would eliminate even that need.

An AMR is a sophisticated communication link directly from the meters to the central office computers that will also speed locating service interruptions, faulty meters and service theft, as well as allowing for expanded services, such as flexible billing dates, time-of-use rates and prepaid accounts. Meters could also be turned on or off directly from the office rather than having to send out an employee to do it manually. The study shows an AMR system would save almost 2-3crore per year by eliminating meter-reading, automating disconnects/reconnects, reducing bad debts and improving meter accuracy and reducing theft of service another positive element of the project would be lower costs for services to the consumer as well.

Many service providers of electricity, water, and gas are trying to implement this system. For example Northern Ireland Water Supply Company had specified its requirements and waiting for tenders. Maharashtra state electricity board has also specified its requirements in 2004-2005.

Automatic meter reading technology can not only save human resources, but more importantly may improve the accuracy and real time of the meter, enabling management sector to access to data messages timely and accurately. No cable wiring can save human and material resources, so investment is considerably economical. Wireless communication links can be quickly built, engineering cycle significantly shortened, and has better scalability compared to a wire-line system . If a fault occurs, only check wireless data module for causes quickly, and then restore the system back to normal operation. In substation there is a requirement of calculating the average daily load, average monthly load, and average annual load. In

our project Live Energy meter reading all this calculation are too easy as well as we can also calculate the individual consumer load at our substation or distribution centre.

II. LITERATURE SURVEY

This article reviews the technical features of automatic meter read (AMR) systems for residential small commercial natural gas meters, including a look at the new static gas meters. AMR systems are today quite widespread for electrical residential meters, but are still in an experimental (pilot projects) stage for other applications in utility meters, such as natural gas residential and small commercial meters. AMR systems allow the recording of gas consumption in an efficient way with some important advantages for the overall gas system, both for the provider and for the user. The main AMR benefits for the customer are:

- * Convenience. Meter readers are eliminated;
- * Efficiency. The AMR system eliminates estimated meter reads; and
- * Accuracy. The electronic unit of AMR, equipped with a reliable encoder technology, is more accurate than manual (or semi-manual) meter reads, thereby eliminating human errors.

New enablers such as automated meter reading (AMR) can be applied to capture and leverage information to help utilities proactively achieve these competitive objectives. Advanced capabilities such as predictive analysis, simulation tools, contingency analysis and network monitoring can go far in giving utilities the power to be successful.

Automated meter reading systems are an attractive technology for cutting costs while increasing speed and control of metering activities [10]. When organizations, such as utilities, military installations, large industrial parks and school districts consider automated meter reading technology, they discover most available systems carry high initial capital costs. Organizations that purchase systems without first evaluating the full costs and benefits often find they are locked into a technology that accomplishes less than they need.

Each level of that process took time and was error prone. The introduction of handheld devices saved time and reduced errors. Drive-by metering further improved the data collection process. This report on Automated Meter Reading Technologies explores this emerging industry in depth, focusing

on the manufacturers and suppliers of AMR technology and equipment, and current trends in the AMR industry. The report also explores the market statistics pertaining to water utilities, available technology, current business requirements, and much more. The report takes a look at the newly gained interest of venture capitalists in automated meter reading technology markets and how it is affecting the industry overall. Read on to find out how this new technology is changing the today utility landscape[9]. Now a day's wireless communication has become ubiquitous around the world and its application for gauging consumption of utilities by customers is rapidly gaining pace, not only in the developed world but also in the developing countries.

III. PROPOSED SYSTEM

SmartMeter Reading. A device which remotely obtain meter readings and transmits this data to the system's computer via communication media such as IOT(Internet communication module) This devices can detect outages, remotely connect and disconnect services, detects tampering as well as other uses. Economic benefits include increased cash flow, lower labour and equipment cost, increased accuracy and lower costs. Some customer satisfaction benefits include improved service quality, more customer choices and faster response time.

The project proposes an efficient implementation for IoT (Internet of Things) used for monitoring and controlling the power system via World Wide Web. We can manage power from any where, through an Internet gateway, by means of low power wireless communication protocols. The user here will move directly with the system through a web-based interface over the web.

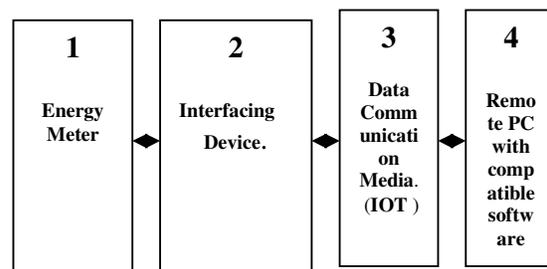


FIG 1: BLOCK DIAGRAM OF SMR SYSTEM

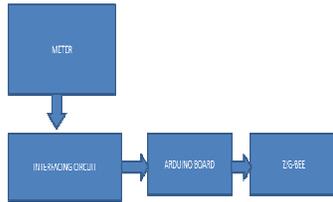


FIG2: TRANSMITTER BLOCK DIAGRAM

Receiving End

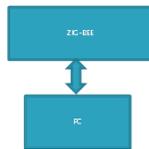


FIG3: RECEIVING BLOCK DIAGRAM

SMR stands for Smart Meter Reading. A device which remotely obtain meter readings and transmits this data to the system's computer via communication media IOT for processing. SMR devices can detect outages, remotely connect and disconnect services, detects tampering as well as other uses. Economic benefits include increased cash flow, lower labour and equipment cost, increased accuracy and lower costs. Some customer satisfaction benefits include improved service quality, more customer choices and faster response time. The Internet of things (IoT) is the inter-networking of physical devices, vehicles (also referred to as "connected devices" and "smart devices"), buildings, and other items—embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data.

In 2013 the Global Standards Initiative on Internet of Things (IoT-GSI) defined the IoT as "the infrastructure of the information society." The IoT allows objects to be sensed or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention. When IoT is augmented with sensors and actuators, the technology becomes an instance of the more general class of cyber-physical systems, which also encompasses technologies such as smart grids, smart homes, intelligent transportation and smart cities. Each thing is uniquely identifiable through its embedded computing system but is able to interoperate within the existing Internet infrastructure. Experts estimate that the IoT will consist of almost 50 billion objects by 2020.

IV. CONCLUSIONS

The Automatic Meter Reading (AMR) is a unique solution for problems in existing manual system. Automatic Meter Reading is self assured automation system. Implementation of Automatic Meter Reading with the help of standalone system is an innovative idea. There are more chances of manual error, delay in processing, tampering of the meter and misuse of the Electricity by other sources but with the help of Automatic Meter Reading, we can easily overcome this anomalies.

Standalone AMR system is most suitable to implement transfer of unit. Using prepaid services, we can make proper use or storage of electricity. Economic benefits include increased cash flow, lower labour and equipment cost, increased accuracy and lower costs some customer satisfaction benefits include improved service quality, more customer choices and faster response time.

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