

Review Paper on Automatic Meter Reading and Instant Billing

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Abstract: Existing systems are electric energy meters, and the use of the energy meter is now limited to writing kWh units. The kilowatt-hour units recorded monthly by the meter reader must be filled in by the reader company. In order to benchmark, companies must link each usage data to a specific account holder and then determine the balance based on the specific usage rate. Researchers have proposed several automatic readout meters (AMRs) based on various platforms. There are many telephone-based AMR systems such as Power Line (PLC) and Telephone Line Network (Fiber Optic/Cable) and wireless AMR systems such as GPRS, Bluetooth, GSM-based electronic measurement systems. Creating a GPRS-based remote data transmission system, but knowledge of this system is not easy, because today the use of GPRS is still a dream for ordinary people. The launch of GSM as a fast-charging power meter is a good thing, but the problem of missing SMS still degrades accuracy and performance. By using the advanced Visual studio .net framework to create a web portal for various logins, you get a more reliable and effective way to keep good information even if SMS is lost. It makes the design different from previous ideas and also improves the material. The GSM/GPRS channel is a useful communication tool because of its good coverage and cost effectiveness; Sending information in the form of SMS is a very useful tool. The front-end portal is user-friendly and any employee with minimal computer knowledge can use the software. Employees can read the indicators while sitting in the office. There are number of app are available for instant billing such as MGVCL app, Adani electricity, MSEB Electricity bill, Vidyut Saathi, ePayon, etc.

Keywords: Automatic Meter Reading system (ARMS), GSM, PIC, Short messaging system (SMS), Visual Studio.NET, MGVCL, MSEB.

I. INTRODUCTION

We never thought of a life without electricity because people's survival and well-being depend on it. The advent of electricity offers the opportunity to use new technologies more efficiently and the needs of future growth. Power line communication [PLC], which was previously used for data communication, has many limitations such as network complexity, installation and maintenance costs. We need different frequencies for different types of service and 50 Hz for powerline cannot support many frequency bands. The power line is not covered because loss will increase, on the other hand, mixing of different channels is also a big problem. There are general problems such as high dependency on people, prevention of human error, easy access in rural areas, and monthly payment, and the process takes a lot of time. A digital wattmeter is an example of a microprocessor-based meter. The 'meter' is designed to send data to the central office quarterly via a dedicated telephone and a dual modem. The next step is to use a DSP-based meter to measure the electricity consumption of residential customers. Therefore, there is a growing need for Wireless Automatic Meter Reading (WAMR) systems that automatically collect procurement, inspection and status information from the equipment being measured and forward this information to a central database for billing, troubleshooting and operations. It will also reduce manual errors as well as human labor, provide the right time to use electricity, provide remote power on/off reduces the time required and increases efficiency. This article presents the application of Wireless Automatic Meter Reading System (WAMRS), which has wide application in GSM/GPRS network. In many countries, GSM and GPRS networks are recognized for their comprehensive service, performance and competitive market growth.

The system has a microcontroller that temporarily sends the electricity bills to the base station of the existing GSM / GPRS network. In order to ensure transparency between customers and companies, we propose a method that uses the communication system to receive data changes, determine the cost of server provisioning and send prices to customers via SMS, e-mail. A new, interactive, user-friendly graphical user interface has been developed using the Microsoft Visual Studio.NET framework. With correct authentication, users can access the generated data web page from anywhere in the world. This article provides a brief description and details about the latest automatic meter reading machine. Current issues and future research directions are also discussed Two Duties and procedures.

II. METHODOLOGIES

Smart Meters: Smart meters are the professional version of traditional electricity meters. It is equipped with communications such as cellular or Wi-Fi that can send real-time data to the power company. This information is used to calculate prices instantly and accurately, eliminating the need for manual measurement.

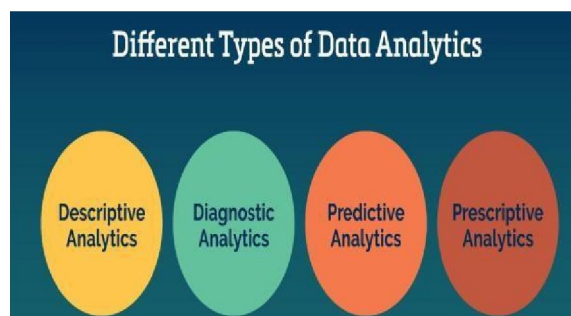


Internet of Things Sensors: Internet of Things (IoT) sensors are small devices that can be connected to existing electronic meters. These sensors continuously collect consumption data such as electricity and water consumption and send it to a central server. Utilities companies can access this information for billing purposes, making the solutions easy and convenient to use.



Mobile Apps: Utilities can create mobile apps that customers can install on their smartphones. These apps allow users to access meter readings, take meter pictures and even extract text using optical character recognition (OCR) technology. The data collected by the application is used to create instant rates.

Data Analytics: Data analytics and machine learning algorithms can be employed to analyze historical consumption data. By identifying patterns and trends in past usage, these algorithms can make accurate predictions about future consumption. This enables utility companies to generate bills instantly based on predicted usage, providing a more precise billing method.



RFID Technology: Radio-Frequency Identification (RFID) tags can be affixed to utility meters. Special RFID readers can quickly scan these tags, capturing meter readings accurately and efficiently. This machine reduces the need for manual reading and provides accurate information.



Blockchain Technology: Blockchain technology provides a secure and tamper-proof way to record measurements and payments. Every meter reading is recorded as an honest and transparent map block, ensuring a high level of data integrity and trust between the utility and its customers.

Advanced Measurement Infrastructure

(AMI): AMI systems provide communication and data management to smart meters. Smart meters collect the data consumed in the middle of the communication and send it to the data center. Utilities can access this information in real time, enabling fast billing based on actual usage.

ADVANCED METERING INFRASTRUCTURE

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Cloud Based Solutions: Storing meter data in the cloud ensures best results and ease of use. The information is securely stored on remote servers and electronic products are made efficient. The cloud-based system simplifies data analysis time and cost calculation, shortening the cost cycle.

Prepaid Meter: Prepaid meter requires customers to purchase credits upfront, similar to prepaid phone plans. As customers use electricity or other services, usage is deducted from their prepaid accounts. This approach eliminates post-use fees and helps smartphone customers better manage their usage and costs.

QR Code/Barcode: QR code or barcode can be printed on electricity bills and electricity meters. Utilities or customers can scan these codes with a or special device. This simplifies the meter reading process, reduces the possibility of human error and speeds up the data collection process.

GSM/GPRS Modem

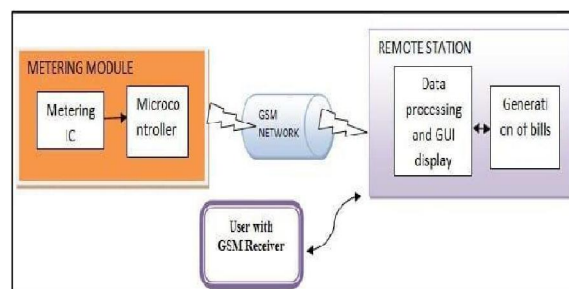
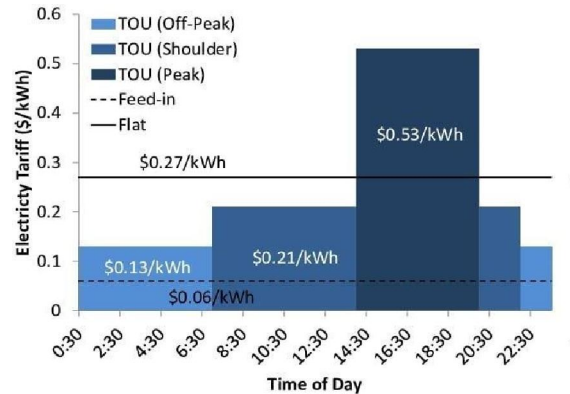


Fig. 3 Overview of Proposed System.

The figure presents an overview of the automatic meter reading process using the GSM/GPRS [5] modem. The meter has a microcontroller electronic meter and a GSM modem to continuously send timely data to the company over the GSM network environment. Remote sites, on the other hand, have a database that stores all the information from the client. Invoices are generated monthly and sent to users via text message and e-mail. Also, for security purposes, a web server has been created where users can control their use from anywhere in the world provides authentication for describes the different user.



However, the use of GSM in this particular system has many advantages over previous methods. Data transfers are charged at standard SMS rates, so billing is not based on data transfer time. good value reading transmission to ensure that energy consumption values can be transmitted multiple times to remote areas. The effect of being able to send readings more often is that utilities can pay on time, better understand energy demand patterns, better manage meter parameters, and better manage fraud. The proposed system is very effective in eliminating the deficiencies in serial communication. So even if SMS sending is not guaranteed, it will not affect the business. If the message is missing, the next extension will contain the missing content when the system accepts. While preparing the invoice, the system accepts the highest consumption price. These uses make the design unique and useful compared to previous comments Electric power companies in many Indian states are starting to use GSM facilities for fault management, so there is an increasing demand for this method.

Instant billing

- **Best Practices:** Some of the popular electronic payment apps include Paytm, Ponape, Google Pay and many state-specific apps like Mob Kwik in Delhi.
- **Features:** These apps allow you to easily pay your electricity bills online. You can link your bank account or digital wallet to make payments.
- **Invoice Receiving:** Most applications provide billing functionality; You can get a new electricity bill by logging into your customer account.
- **Payment options:** These apps usually support multiple payment methods such as UPI, Debit/Credit Cards, Net Banking and Digital Wallets.
- **Warning:** often send payment notifications and provide businesses with email or SMS receipts.
- **Customer Support:** If you're having trouble paying, find apps that offer excellent customer support
- **Security:** Make sure the app you choose has good security to protect your payment information.
- **Rewards and cashback:** Some apps offer rewards, cashback or discounts on electricity bills. Always download official apps from trusted sources and beware of phishing scams or fake apps. Always double check app permissions and reviews before installing. Some app for instant billing is as follows: **MGVCL** app, Adani electricity, **MSEB** Electricity bill, Vidyut Saathi, ePayon, etc.

III. CONCLUSION

Automatic measuring systems have undergone significant changes in the last few years. Electricity power in many states of India such as Kerala Electricity Authority (KSEB) has adopted the system for its fast, efficient and error-free

operation. This article methods used to resolve the issue and eventually reach this level. This article discusses new ideas and methods used to develop AMR applications. Currently, PLC, smart meter, WSN, GSM/GPRS are mainly used in automatic meter reading.

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