

AUTOMATED WIRELESS POWER BILLING SYSTEM

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Abstract:

The Automated Wireless Power Billing system is designed to automate prevailing electricity billing system and make it simpler and efficient. The Automated Wireless Power Billing system consists both hardware components and software modules. The hardware components include Microprocessor 89C51, GSM modems and smart phones. The software modules include Android OS, Java, Database & PHP languages and Embedded C. The system combines the capabilities of GSM technology and provides user friendly GUI interface. The main aim of the system is to minimize human intervention and avoid tampering of electricity meter readings.

Introduction:

Electricity is one among our basic needs in our day to day life. Electricity is the set of physical phenomena associated with the presence and flow of electric charge. Electricity is consumed in household as well as industrial and commercial areas on a very large scale. No sector will be able to function without the electricity supply and is hence an indispensable part of the human life. Electricity playing an important role in the lives of human beings in the 21st century the automation in the billing system was much necessary.

The traditional metering systems has many disadvantages as manual reading has short comings such as errors in taking reading, inaccuracy, external conditions affecting readings, delayed work. These techniques also require huge manpower. With the rapid developments in the Wireless communication technology by the use of microcontrollers, there are many improvements in automating various industrial aspects for reducing manual efforts. The traditional manual Meter Reading was not suitable for longer operating purposes as it spends much human and material resource. It brings additional problems in calculation of readings and billing manually. These processes are time consuming and difficult to handle. So the problem which arises in the billing system can become inaccurate and inefficient.

Automated wireless Power Billing system(AWPBS) is one way to avoid these shortcomings. Automated Wireless Power Billing helps to take the reading of the electric meter through the GSM MODEM via SMS. The GSM MODEM helps to extract the reading from electric meter, the electric hub will send back generated bill back to the user.

Objectives:

- To avoid human intervention in energy meter reading by introducing GSM based energy meter.
- To configure GSM modem to extract energy meter readings, compose message containing meter readings and send the message to the central server via SMS.
- To design and implement web server application for receiving meter readings and handling billing related transactions.
- To configure web server application for sending billing details to registered customers.

Proposed Methodology:

The AWPB system consist 3 modules they are Automated Power Billing (APB) module, Supplier module, Customer module. The proposed system is as shown in the Figure 1.

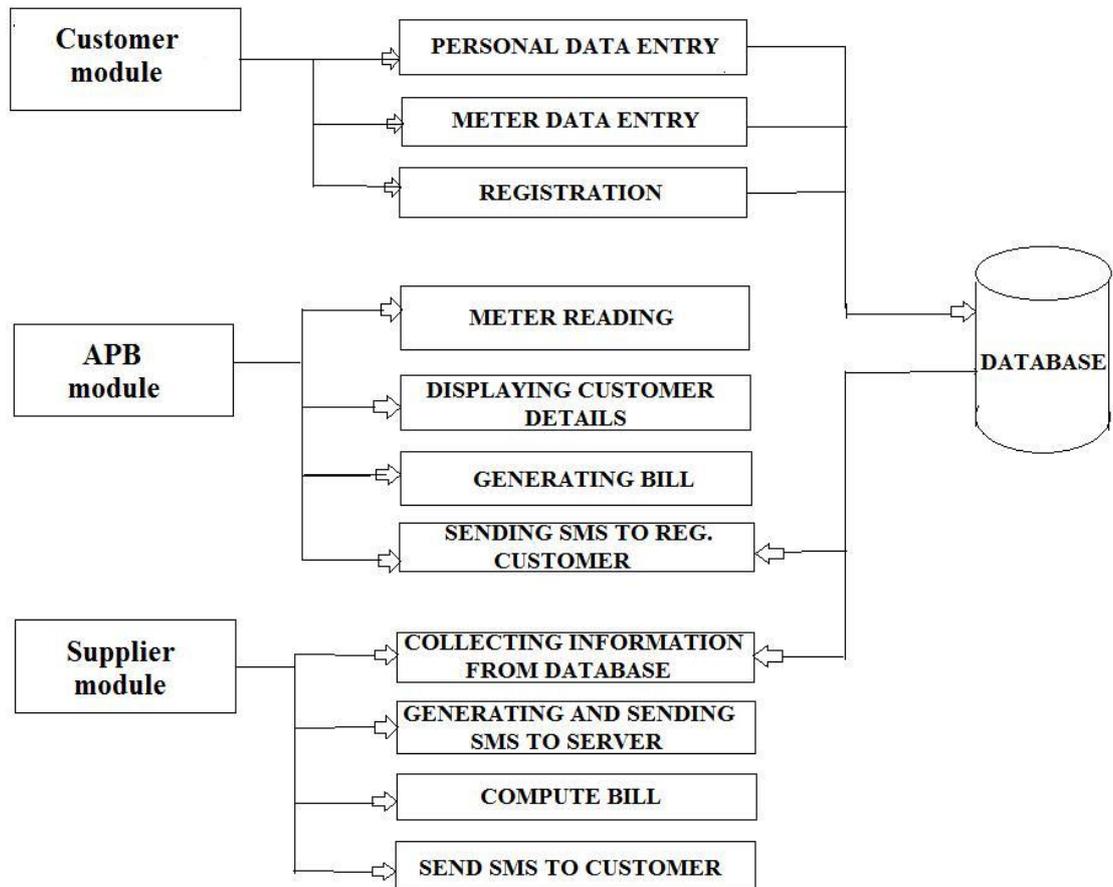


Figure 1: Proposed Methodology

Requirement Gathering:

To implement the stated system, following hardware and software components are required.

Hardware Requirements	Software Requirements
➤ Microcontroller	➤ Development Tool
➤ GSM Modem	• Keil Micro Vision(IDE)
➤ Energy Meter (HESCOM)	➤ Programming Language
	• PHP
	• Embedded c
	➤ Database
	• MYSQL

Results and Snapshots:

The components of Automated Wireless Power Billing System are interconnected as shown in Figure 2.

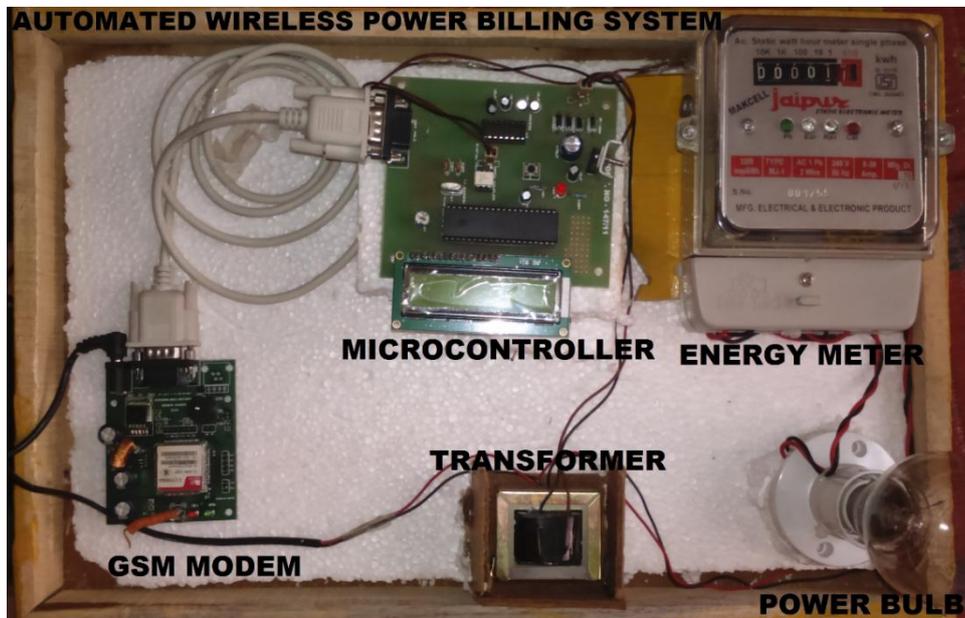


Figure 2: Automated Wireless Power Billing System

The following are the message contents sent from GSM modem present in the AWPB system. This message is received by web server and it extracts the units consumed to generate the electric consumption bill.

```
| incoming msg | Electricity Billing System
UNITS: 0.00312
```

The snapshots of server functionalities are shown in Figures 3, 4 and 5.

Meter Reading

RR Number	Meter Number	Start Date	No Of Unit	Contact	Activity	
456	654	2017-05-03	31200	+918884023897	Generate	Click to view in Bar Chart
890	098	2017-05-03	31200	+918310273458	Generate	Click to view in Bar Chart
890	098	2017-05-03	31200	+918310273458	Generate	Click to view in Bar Chart
456	654	2017-05-03	31200	+918884023897	Generate	Click to view in Bar Chart
890	098	2017-05-07	31200	+918310273458	Generate	Click to view in Bar Chart
456	654	2017-05-07	31200	+918884023897	Generate	Click to view in Bar Chart

Figure 3: Meter Readings listed by Sever

Bill Details

RR Number	456
Meter Number	654
Date	2017-05-03
Total Units	31200
Cost Per Unit	4
Total	124800
Last date bill pay	2017-05-28

Figure 4: Bill details generated by Server.



Figure 5: Customer SMS format.

Conclusion and Future Scope:

The project proposes automation for existing manual power billing system. This involves the automation process of taking a meter reading and computing the billing by examining the number of units consumed by the user of that particular registered energy meter and sending a computed bill to the registered mobile number of a user. Thus Automated wireless power billing involves total authentication over accessing a data from energy meter and provides accurate and timely billing. Further this system can be extended to automate the gas and water supply services.