

# The System for Managing Electricity Bills

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**Abstract:** *The remarkable advances in science and technology have raised the bar for human life expectancy. Without these breakthroughs, the globe will be overloaded. In contrast to other ongoing projects, this one is innovative in that it simplifies the process of paying an electrical bill. MySQL served as the back end and Java Swing served as the front end for this project's implementation. The project's goal is to create an application software that will automate the process of tracking clients' unit consumption and creating electricity bills based on whether they are business or individual customers. It shows client information, the number of units they have used, and past bills. As you pay the bill, the date of payment will be updated. It effortlessly integrates upcoming advancements and modifications while maintaining an error-free database.*

**Keywords:** Bill history, Bill payment, Electricity bill, Java Swing, MySQL, Type of customer.

## I. INTRODUCTION

This project intends to serve the department of energy by computerizing the billing system. The energy Billing System is a software-based application.

It is primarily concerned with calculating the number of units used within the allotted period and the amount of money that the electricity offices will charge.

Customers will find the entire billing method simple, easy to use, pleasant, and efficient thanks to this automated system.

The project has incorporated the following elements to make the billing system simpler and more service-oriented. The application performs at a high rate of accuracy and efficiency.

Unlike a traditional system, which requires people, the software allows for data exchange.

After installation, the client may examine all data and the admin can only provide the meter readings. Security restrictions are included.

The software used for power billing computes the units used by the client and generates invoices; its installation and operation need a limited amount of storage. In the event that the system has a problem, debugging is possible. Users may pay the amount without going to the office, administrators do not need to manually keep track of users, and the technology eliminates the need for paper electrical bills. It saves resources and human labor as a result.

## II. OBJECTIVE

As the project owners, we value each and every client and strive to satisfy them.

Our project's primary goal is to please the client by saving them time throughout the payment process, keeping records, and enabling them to see and edit their information.

The company does all of the work by hand, which is incredibly time-consuming and inconsistent.

The following are the project's goals:

- To save the data on energy use for the current month.
- To preserve customer information.
- To save the data on energy use from the previous month.
- To routinely compute the units used each month.
- To produce the bills with the rent and penalty included.
- To expedite the payment process by utilizing an online platform.

**II. LITERATURE REVIEW**

**Merza AM, Nasr MS (2015):** Due to client absences from their homes at such period, difficulties obtaining meter readings, and occasionally unsafe locations, there are several issues with metering and invoicing procedures for meter readers who take manual readings. The traditional approach is not very good for retrieving the billing and energy meter data. The meter reader finds it laborious to manually gather the data and then submit it to the electricity distribution office so that each customer's bill may be issued. However, energy meter inservice is known to have measurement inaccuracies. The two main issues mentioned above are waste of money and inadequate management of the distribution of electricity, which leads to a shortage of electricity.

An Arduino microcontroller will be used by the energy monitoring system to automatically measure the voltage, current, power, and energy units utilized. We can determine the power usage using this value. With the use of Internet of Things (IoT) technology, this project offers a critical answer for an energy monitoring system. It allows us to create the system without human intervention and uses smart energy meters to measure electrical energy consumption and obtain an accurate reading.

**Rahul K. Sai (2016):** The foundational programming language used to create the system is JSP SERVLET, which can be used to create webpages, web apps, and web services. Web databases are managed via the relational database management system MYSQL, which is based on Structured Query Language (SQL). The administrator and user logins would be the two logins available on the system. The administrator has access to the user's account information and can add the customer's energy consumption data for the current month.

**III. REQUIREMENT SPECIFICATION**

The software used for the development of the project is, as follows :-

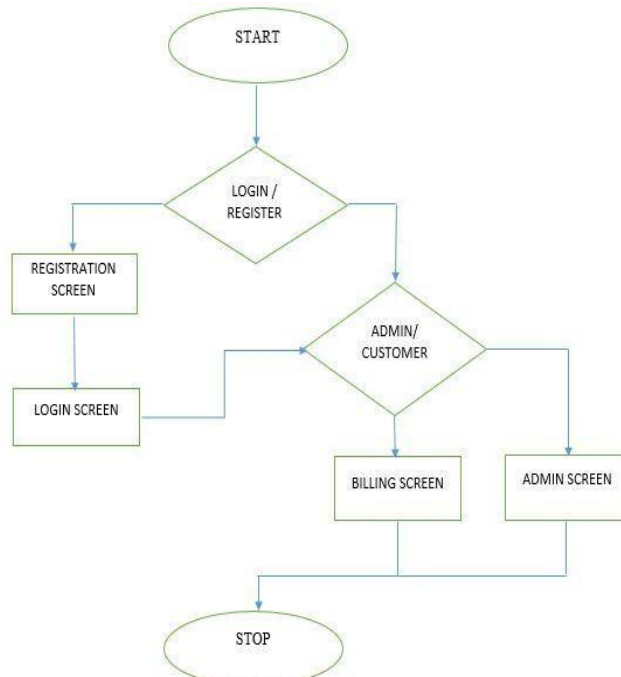
**Operating System:** Windows11

**Software:-**Microsoft SQL Server

**Front End:** Javacore/swings(NetBeans)

**Back End:** -My SQL

**Flowchart**



**Fig 1. Flowchart**

#### **IV. APPLICATION AND TECHNOLOGY USED**

##### **JAVA**

One of the computer languages that is solely object-oriented is Java. It has a lot of C++ features. Web-based programs may be written in this language. Java accepts

##### **Java supports**

Encapsulating and abstracting data..

##### **JAVA SWING**

A collection of expandable GUI elements called Swing API makes it easier for developers to design front-end and GUI Java programs. On top of AWT, it is constructed. AWT is replaced with an API. Nearly all AWT controls are matching API controls. Model-View-Controller (MVC) architecture is used by the Swing component to meet the following requirements:

Multiple looks and feels should be supported via a single API.

Model-driven APIs eliminate the need for data to be included in the highest-level API.

The Java Bean model will be used by the API in order to improve the services that developers may access through the building tool and IDE.

##### **MYSQL**

The most widely used open-source relational SQL database management system is called MySQL. One of the greatest RDBMSs for creating different web-based software applications is MySQL.

##### **RDBMS:**

Software known as a Relational Data Base Management System (RDBMS) allows us to create databases containing tables, columns, and indexes.

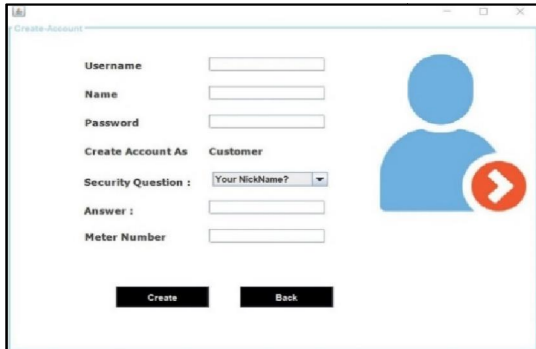
- Ensures the referential integrity of the rows in different tables.
- analyzes a SQL query and merges data from many tables.

The indexes are automatically updated.

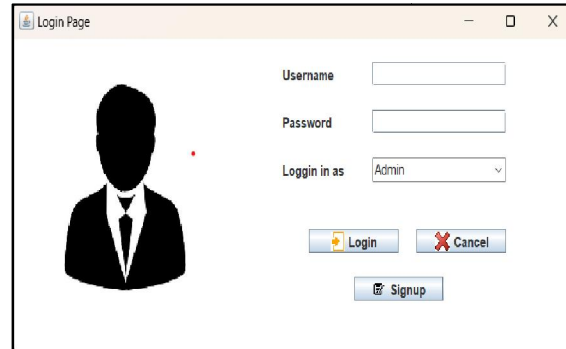
##### **Terminology Used in RDBMS:**

- Table: A table is a data matrix;
- Database: A database is an assortment of tables containing connected data. A database table resembles a basic spreadsheet.
- Redundancy: To speed up the system, redundantly store data twice.
- Primary key: Only one primary key exists. In a single table, a key value cannot appear twice. We can only locate one row with a key.
- Foreign key: A foreign key is what connects two tables together.
- Compound key: A composite key, also known as a compound key, is a key with several columns since one column is insufficiently unique.
- Referential integrity: This ensures that a foreign key value always refers to a row that already exists.

**V. OUTCOMES**



**Fig 2. Registration Screen**



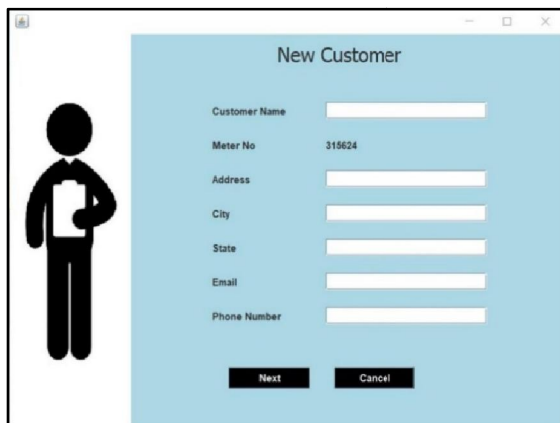
**Fig 3. Login Screen**



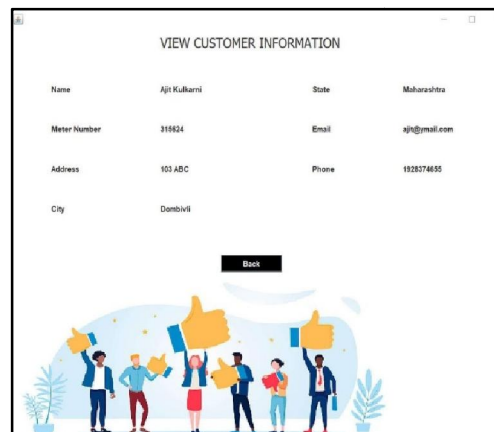
**Fig 4. Admin Screen**



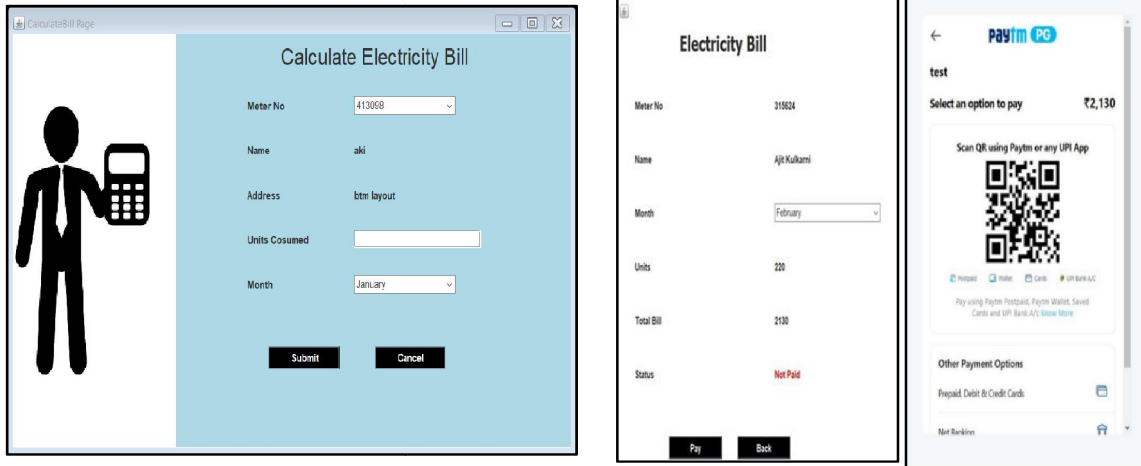
**Fig 5. Customer Screen**



**New Customer Screen for Admin**



**Customer Information**



**Bill Calculate Screen for Admin Payment Screen for customer**

## VI. CONCLUSION

After all the hard work is done for electricity bill management system is here. It is a software which helps the user to work with the billing cycles, paying bills, managing different DETAILS under which are working etc. This software reduces the amount of manual data entry and gives greater efficiency. The User Interface of it is very friendly and can be easily used by anyone. It also decreases the amount of time taken to write details and other modules.

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