Electricity Billing System Project Report

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1. INTRODUCTION

Electricity is one of the most essential utilities in our day-to-day life, and managing its usage and billing effectively is critical. The Electricity Billing System is a Java-based application developed using the NetBeans IDE with MySQL as the backend. This project aims to automate the traditional billing system, reduce manual errors, and improve efficiency. The main purpose of this project is to build a system that can generate electricity bills based on meter readings and other related parameters, maintaining user and billing information in a structured format.

This system is particularly helpful for power distribution companies, billing agencies, or any authority responsible for managing electricity consumption and charges. By reducing manual paperwork and automating the process, the system enhances both accuracy and user experience.

2. OBJECTIVE OF THE PROJECT

The primary objective of the Electricity Billing System is to provide an efficient, user-friendly, and accurate platform to handle:
- Customer registration and data management
- Electricity usage tracking
- Automatic bill generation based on consumption
- Storage and retrieval of customer and billing records
- Secure user authentication and access control

3. TECHNOLOGIES USED

- Java: Used for writing application logic and user interface.
- NetBeans IDE: The development environment used for building the system.
- MySQL: A relational database used for data storage and retrieval.
- MySQL Workbench: GUI tool to interact with MySQL database.
- JDBC: Java API used to connect and execute queries with the MySQL database.

4. SYSTEM ARCHITECTURE

The Electricity Billing System follows a client-server model where Java handles the front-end GUI and business logic, and MySQL acts as the backend database. JDBC facilitates the communication between these two layers. The architecture includes:
- Presentation Layer (Java Swing GUI)
- Business Logic Layer (Java methods and classes)
- Data Layer (MySQL Database)

5. DATABASE STRUCTURE

The MySQL database named 'ebs' includes the following tables:
- login: Stores user credentials and roles.
- customer: Stores customer details such as name, address, contact.
- meter_info: Contains data about the meter type, location, and billing.
- tax: Stores information about charges such as service tax, fixed charges.
- bill: Contains billing records for each meter by month.

Sample Query:
CREATE TABLE login (meter_no VARCHAR (20), username VARCHAR (30), name VARCHAR (30), password VARCHAR (20), user VARCHAR (20));

6. FEATURES OF THE SYSTEM

- Secure login system for admin and users
- Add, update, and view customer information
- Meter data entry and modification
- Monthly bill generation based on units consumed

- Auto calculation of taxes and fixed charges
- Billing status: paid/unpaid
- Reporting and record access functionality

7. SCREENSHOTS AND GUI DESIGN

The system GUI includes multiple interactive forms built with Java Swing. Screens include:
- Login screen
- Customer data entry form
- Meter information entry
- Bill generation screen
- Dashboard with reports

8. CONCLUSION AND FUTURE SCOPE

The Electricity Billing System is a comprehensive application that simplifies the process of electricity billing. It improves efficiency, reduces the chances of error, and supports scalability. The modular nature of the code allows for easy upgrades in the future.

Future Scope:
- Integration with online payment gateways
- Mobile application interface
-Real-time meter reading via IoT integration
- User notifications through SMS or email