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**Department of Business and information technology**

**Java project description**

**Electricity billing system Project**

* **Planning:**

We have developed this project "Electricity Billing System" for managing all the operations of the Electricity Department by a computer software system. This projects has capable to perform all the operations needed by electricity department. This project has been developed using java. The system will enable the electronic sale of electricity and will centralize the process to prevent fraud.

**Project objectives**:

The major Objective of our project is to please customers by saving them time via the payment process, maintaining records, and allowing them to see and amend their information.

other objectives:

1. To develop an online system to manage electrical billing for the administrator and customer.
2. To collect the power consumption information and integrate with centralized database system via GSM device.
3. To calculate the electrical bill and generate a report on the power consumption information through online.

**Project goals**

1. Electricity Billing System will manage rental slots on electricity billing.
2. Electricity Billing System will allows the customers to access and view the value and the accumulate cost of power used through online with centralized database.
3. Electricity Billing System will improve revenue collection and reduce billing errors.
4. Electricity Billing System will generate the reports based on the power consumption information received from GSM for customer respectively
5. Electricity Billing System will calculates the units consumed by the customer and makes bills.
6. Electricity Billing System will Avoid sending incorrect invoices to customers

**Electricity billing system will solve the following future problems:**

1. There is no need of delivery boy for delivery bills to user’s place. o Thus, it saves human efforts and resources.
2. Users don’t have to visit to the office for bill payment.
3. Administrator doesn’t have to keep a manual track of the users. The system automatically calculates fine.
4. This project system excludes the need of maintaining paper electricity bill as all the electricity bill records are managed electronically.
5. Support for renewable energy sources: The billing system must be able to support the integration of renewable energy sources, such as solar and wind power, into the grid.
6. Cyber security: The billing system must be designed with robust security measures to protect against cyber attacks and protect customer data.

**Design:**

The proposed electricity billing system will be designed as a desktop application with a user-friendly interface. The system will be built using Java programming language as for the back-end and Netbeans as for front end. The system will also use a relational database, such as MySQL, to store customer and usage data.

**Development:**

In this project, I used Netbeans as the front-end development platform and Java as the back-end language. The database used was MySQL and I utilized the MySQL Connector library to establish a connection between the application and the database. This allowed me to easily interact with and manipulate the data stored in the MySQL database.

**Features:**

To make the billing system more service-oriented and simple, the following features have been implemented in the project.

1. The application has high [speed](https://www.codewithc.com/32-things-tools-that-will-make-software-development-speed-50-faster/) of performance with accuracy and efficiency.
2. The software provides facility of [data](https://www.codewithc.com/data-visualization-java-project/) sharing.
3. It doesn’t require any staffs as in the conventional system. Once it is installed on the system, only the meter readings are to be given by the [customer](https://www.codewithc.com/customer-billing-system-project-in-c/).
4. The electricity billing software calculates the units consumed by the customer and makes bills.
5. It has the provision of security restriction.
6. It requires small storage for installation and functioning.
7. There is provision for debugging if any problem is encountered in the system.

## **Modules in Online Electricity Billing System**

* **Admin Module-** This module will allow Admin to log in and manage the system and its functions.
* **Registration Module-**In this module, a user can register first using their name, contact number and address.
* **User Module**– The user module will allow users to log in to the system using their names & password. Users can view their electricity bills, data usage, payment status and history.
* **Billing Module-**In this module, operations related to Electricity bills can be managed.
* **Payment Module-** In this module, Users can pay for Electricity bills and services provided using e-payment methods.
* **Download Module-**Users will be able to download Electricity bills & invoices in this module.
* **Details of User-** Details of a User like a Name, Contact Number, Address, meter number, bills, and payment history can be managed by Admin with this module.

**Testing:**

In the testing stage of our electricity billing system project, we followed a systematic approach to ensure that the system functioned as expected. I began by creating test cases for all the major functionality of the system, such as registering and login, generating bills, and form validations to insure security of the system. I then executed these test cases and recorded the results.

During testing, I identified several defects and bugs in the system, such as errors in the calculation of bills, issues with data validation and missing functionalities. I then used debuggers and other tools to identify the root cause of the issues and applied appropriate fixes to the code.

To ensure that the product met the original specifications.

Additionally, we also performed User Acceptance testing, where we invited a group of end-users to test the system and provide feedback, which helped us in finalizing the product and making it more user-friendly.

in other word, the testing process was an important step in the development of the electricity billing system and helped us to deliver a high-quality product that met the original specifications.

* **Deployment**

In the installation, testing, deployment and performance monitoring stages of our electricity billing system project, we used our own personal laptops as the development and testing environment.

For the installation, we first set up the necessary software and dependencies, such as the Java Development Kit, Netbeans IDE, and MySQL. We then imported the project files into Netbeans and configured the application to connect to the MySQL database.

We made sure that the system functioned as expected and met the original specifications.

So, the installation, testing, deployment, and performance monitoring stages were critical in ensuring that the electricity billing system was functional, user-friendly, and high-performing.