"Harnessing Efficiency: Modernizing Electricity Bill System Using Java"

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Abstract - The amazing developments in science and technology have raised the bar for human living standards. Without these improvements, the entire planet will be physically congested. Compared to other projects now in existence, this project is innovative in that it simplifies the process of paying an electrical bill. Java has been used to implement this project. The project's goal is to create an application software to lessen the human labour involved in keeping track of the quantity of units consumed by clients and creating power bills based on whether they are individual (house), commercial, or industrial. It shows client information, the units they consumed, and their billing history. If their bill is unpaid, it allows them to pay it. The date of payment will be updated while paying the bill. It maintains error free database and easily incorporates the future developments and changes.

*Key Words***:** Bill History, Bill Payment, Electricity Bill, Cash deposit Machine – SIM SMS – Electricity Billing Smart Retrofitting

1. INTRODUCTION

This It's a new conception of paying electricity bill using Java, where the other being styles of electricity
bill operation use Java access garçon.
This system is made to keep the records about the bills of
the guests. The director can manage all the accounts;
the registered druggies like individual guests, marketable guests
can only manage their own accounts and they can
not see any details of other guests. This system helps
in maintaining the bill and payments. There are four
modules videlicet Registration, Login, Admin and
Billing screen. This system helps in maintaining the bills and
the payments. A different module is there
for workers to check the client's details if their job requires it.
Admin, workers, and guests all have a different interface
and different boons according to their requirements. Like
a client can only manage his account and can
not see any details of other guests, workers can see the details of
all the client's accounts and the admin can manage all
the accounts including the guests and workers ' accounts.
To design the
billing system more service acquainted and simple,
the following features have been enforced in the design.
The operation has high speed of performance with delicacy and effectiveness.
The software provides installation of data sharing, it
doesn't bear any staff as in the conventional system. Once
it's installed on the system only the cadence readings are
to be given by the admin where client can view all details, it has
the provision of security restriction.
The electricity billing software calculates the units consumed by
the client and makes bills, it
requires small storehouse for installation and functioning.
There's provision for debugging if
any problem is encountered in the system.
The system excludes the need of maintaining paper electricity
bill, director doesn't have to keep amanual track of
the druggies, druggies can pay the quantum without visiting the
office. therefore, it saves mortal sweats and coffers..

2. LITERATURE SURVEY

According to [1] Java Swing was used for the user interface, while MySQL was used for the database in this project. The goal of this project is to develop a software application that will automate the process of calculating the power charge based on the type of customer (residential or commercial) and the number of units used by that customer. Information about the consumer, the quantity of units used, and the total cost incurred are all shown. If the bill is not paid, this gives them the ability to cover it. In the process of paying the bill, the due date will be reset. It maintains a reliable database and adapts to upcoming changes with little effort.

According to [2] there are several problems with the current billing system, including fraud and other irregularities in the billing process, a lack of accountability for late payments, the need for more personnel and paper, and inefficient use of resources. In addition, if there is a fire or a technical issue, the whole lane's transformer would lose power, which might be inconvenient for neighboring customers. In this case, the economic loss is a major worry because of the manual billing process. In a system where bills are created manually, this occurs once a month or once every two months. An energy department worker visits each home to read the meter and issue a charge depending on the amount of power used. Hence, a suggest and describe a novel adaptive method that mitigates these losses and others.

According to [3] Once NetBeans IDE was used to successfully create MySQL, the Electrical Regulatory Control System switched to using Java Swing. It's easy to use and effective. This Java-based code serves as a standalone system. In the broad spectrum of planned developments. The payment department may do away with all paperwork manually in one fell swoop. There has been a clear improvement in precision and dependability. It ensures that no unauthorized users may access the system. The use of this application is risk-free and secure.

According to [4] an authorized electrician checks each home's meter board, reads the meter, and then creates an accurate duplicate of the customer's power bill. This takes

a lot of time and effort on the part of many people. Based on the findings of the Energy Tracking and Bill Estimation System, we have developed a plan for creating an Internet of Things-based smart energy meter. The energy meter in our suggested system is connected to a microcontroller (MCU), which reads the meter and relays the data over Wi-Fi to a graphical user interface (GUI). The consumption reading is automatically updated at regular intervals. Here, the client is updated on his or her energy use.

3. SYSTEM ARCHITECTUIRE

The online version of the volume will be available in The system architecture gives the overview of the organizational system that shows the system boundaries, external entities that interact with the system, and the major information that flows between the entities and the system.
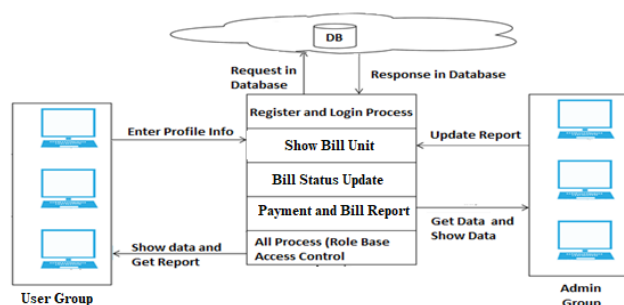
Module

User:

After registration, one can log in to the system as the end-user of the system on the behalf of the user. The user will get only those privileges that are given to the user for which one has registered. The user can be anyone either a customer or an employee. If the user is an employee then he can make changes to the data like adding units in the bill, used by a customer.

Queries:

In this module, the customer can ask any query he has and his question with his details will be sent to the person who is managing queries and then he or she can reply to the query of a customer.

Admin:

This module can only have one account and this account has all the privileges which a user account might not have. First of all, the admin account is created and then if the admin verifies a registering user his account will be created otherwise not.

Department:

In this section, all the employee's details can be seen by the privileged user. All the employees are divided into different sections according to their job profile. Employees working in multiple sections might get repeated into the different departments.

In this, new customers can be added, monthly bills can be sent to the customer's accounts, any particular customer can be found using a unique meter id and the remaining balance of a customer can be checked.

4. SOFTWARE AND HARDWARE REQUIREMENTS

Technologies and tools used in Policy system project are as follows Technology used:

Software Requirement

Front End

- Internet Explorer 6.0/above
- Tools: Eclipse or net beans, Heidi SQL, JDK 1.7 or Higher
- Programming Language: JAVA/J2EE

Back-End

- MYSQL 5.1
- Heidi SQL

Hardware Requirement

- Processor:- Intel Pentium 4 or above
- Memory:- 2 GB or above
- Other peripheral:- Printer
- Hard Disk:- 500 GB

5. CONCLUSION

Electricity Billing System project reports Before suggesting this solution they were using a manual process on meter reading, amount calculation, and billing customer and so on. The interaction between customer and Electricity Board was very poor and it took much longer to respond to customer queries.

REFERENCES

[1] Kumar, Ashutosh, Dharmendra Pratap Singh, and Sagar Subham. "Electricity Bill Management System." Annals of the Romanian Society for Cell Biology 25.6 (2021): 6062-6067.

[2] Pramod Kumar, P., and K. Sagar. "A proficient and smart electricity billing management system." Advances in Decision Sciences, Image Processing, Security and Computer Vision: International Conference on Emerging Trends in Engineering (ICETE), Vol. 1. Springer International Publishing, 2020.

[3] Yadav, Shubhanshu. Electricity Bill Management System. No. 5874. EasyChair, 2021.

[4] Shree, P. Sowbhagya, et al. "Smart Metering System." International Journal of Research in Engineering, Science and Management 5.4 (2022): 36-39. [5] Raju, R., P. Madhumathy, and G. Pavithra. "A Comparison of Smart Electricity Billing Systems." 2020 International Conference on System, Computation, Automation and Networking (ICSCAN). IEEE, 2020.

[6] Alam, Md Abrarul, and Mohammad Zeyad. "Smart cities and buildings: GSM based smart electric energy meter billing system." 2019 IEEE International Conference on Power, Electrical, and Electronics and Industrial Applications (PEEIACON). IEEE, 2019.

[7] Vivek, P. Swamy, et al. "Arduino based Smart System for Control and Effective Billing." 2021 International Conference on Artificial Intelligence and Smart Systems (ICAIS). IEEE, 2021.

[8] Katreddy Prameela, Karri Nanajee, "ELECTRICITY BILL MANAGEMENT USING GSM TECHNOLOGY". IJCRT21A6081 International Journal of Creative Research Thoughts (IJCRT) | Volume 9, Issue 5 May 2021 | ISSN: 2320-2882

[9] Miah, Shahajan, et al. "Internet of Things (IoT) based automatic electrical energy meter billing system." IOSR Journal of Electronics and Communication Engineering 14.4 (I) (2019): 39-50.

[10] Arpitha Shankar S I , Chaitra T V , Meghana S , Sadhana Prakash Sharma , Shilpa M, 2015, Billing of Electric Meter using GSM, INTERNATIONAL JOURNAL OF ENGINEERING RESEARCH & TECHNOLOGY