AUTOMATIC FRAUD DETECTION IN ELECTRICITY BILL AND DETAILED ANALYSIS OF ELECTRICITY CONSUMPTION

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Abstract - *The main purpose of this project is to detect fraud in electricity consumption and generate detailed report analysis on usage of electricity, receiving notifications of the over consumption of electricity to the user.*

The idea introduces a system based on Application to understand the consumption of electricity and detect fraud in electricity bill .User can generate a detailed analysis report of electricity consumption so that users can easily understand where they utilize their electricity in a particular span of time. The system solves the issue by detecting fraud in electricity bills for that application generates electricity bills based on the use of electricity units per month , then the user can compare this system-generated bill with their actual payable bill . Hence it is very easy to know exactly if fraud happens or not in electricity bills. The application gives notification to the user when electricity consumption crosses the limit set by the user. Overall system plays an important role in Automatic Fraud Detection in Electricity Bill and Detailed Report Analysis of Electricity Consumption.

Key Words: **Automatic Fraud Detection in Electricity Bill, Consumption of Electricity, Smart Electricity Meter, Usage of Electricity.**

1. INTRODUCTION

The feasibility of a product is a measure or a degree of how well a proposed system solves the problem, and takes advantage of the opportunities defined during the scope definition. The proposed system is a very robust and practically applicable system. In this system the electricity bill fraud detection, detailed analysis of electricity consumptions, and notification on overuse of electricity are provided to users.

The system will provide more reliable aspects than the existing systems. It is faster than any other system. Hence the efforts taken by the User for detecting the fraud in electricity bill, the efforts taken by users to monitor consumption of electricity use are reduced or less than existing.

This system also provides a feature of the detailed Analysis Report of Usage of Electricity. The user can easily Understand usage of electricity and take appropriate action accordingly. If the user wants to set a daily limit on usage of electricity it can set and this application sends notification to the user if that limit gets crossed.

Also, the proposed application generates bills as per data present in the database and we can compare both system generated bills and actual bills .Hence it is very easy to know exactly if fraud happens or not in electricity bills.

The mechanical work of the application such as storing the data of the user and sending the notification and message is done within the second. Hence it is easy to send responses to users in minimum time. The operational feasibility of the application is very easy and user interactive.

2. Literature Review

2.1 Existing System present?

In the pandemic period the country observed the lots of drawbacks of the existing system. Now the question carries how the existing system works? The employee from the electricity supply company visits the users door to door and takes pictures of the electricity meter .The picture contains the units used by the user. This data is used to calculate electricity bills. The electricity provider company has some predefined structural amount for different sectors for example Industrial and household. By calculating the total units used by the user and the amount per unit the company provides an invoice to the user. But to get this data the employee

needs to visit every single home which contains an electricity meter.

2.2 Frauds in Electricity Bill

As a normal user it's not possible to take a look at every single movement of electricity consumption. The electricity provider company generates payable electricity bills at the last of month/year depending on the purpose of consumption but it does not provide an analysis of uses. The invoice contains the total number of units used by the user and the payable amount for the total use. The process is not reliable as it does not contain analysis so the user does not get an idea where he/she is using this mentioned amount of electricity or not. Another factor is that data gets handled manually in the existing system so there are chances of human error or mistake.

2.3 No Track of Consumption

Track of consumption means the user should be notified by usage of electricity after some interval of time. For example after a week user should get notify current used unit by user and the predicted payable Amount at month end. So that users can manage the use of electricity. The telecom companies send the notification to users when users reach their daily limit of internet quota. It gives an idea to the user and the user can take appropriate action .The same kind of scenario should be implemented by the current existing system. In the current existing system data comes manually as the person needs to visit the electricity meter board physically. So it's not a feasible process to visit the electricity board after some interval of time. The current existing system does not contain track of consumption.

2.4 Unaware about the daily limit of electricity

The existing system does not provide any kind of notification to users regarding the usage of electricity so users are not aware about usage of electricity. So sometimes users use more electricity and they have no idea about it.so it directly impacts the electricity bill. Payable amount is directly proportional to the unit used by the user in order to get under budget payable bill. Users should analyze and set daily limits on the basis of the previous data. If the daily limit gets crossed users should get notified and so the user can maintain electrical devices to minimize units of electricity .If System provides notification to the user then the user

can take action to save more consumption of electricity and also save a payable amount.

3. System Development

3.1 Architecture

Fig 1 depicts the system architecture of the proposed system i.e., Automatic Fraud Detection in Electricity Bill and Detailed Report Analysis of Electricity Consumption, Therefore, the architecture will give a brief idea about the current system:

The current application is Automatic Fraud Detection in Electricity Bill and Detailed Report Analysis of Electricity Consumption. So basically, the system includes 4 Modules i.e. extract digit from image, generate electricity bill, detailed analysis report of electricity consumption, notify user on overuse of electricity.
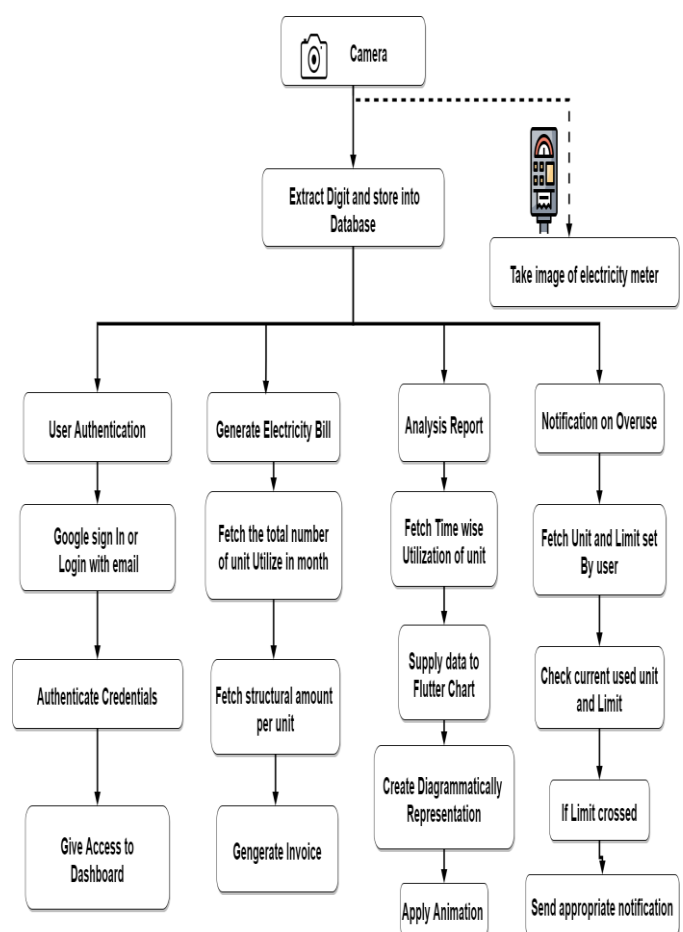
The process starts from capturing the image of the electricity meter. The required data like Unit value, Date get extracted and saved into a firebase database for the future reference.

The Application have 4 Main Modules i.e. User Authentication, Generate Electricity Bill, Analysis Report, Notification on Overuse

To get access to the dashboard, users must be authorized. For the authorization purpose users have two options Google Sign in Or Login with Email and Password. Once the credential is authorized, the user gets access to the application.

On the dashboard users can find the electricity bill module where users can generate electricity bills for the current month. The data i.e. total unit utilization per month gets fetched from the database. Then System will generate an invoice which contains a payable amount and other necessary details for user reference.

Using Flutter Chart, Application generates Graphical representation of consumption of electricity. It contains different modules to generate Charts as per the users request i.e. Analysis report per Year, Analysis report per month, Analysis report per week. For this task the application sends the request to the database and fetches unit utilization time wise. Once the data gets received, flutter charts apply this data dynamically for generating charts with animation.

Track of consumption of electricity use is done with the help of Notification module. Users can get an option to set limits day wise or week wise depending on the user input system will check whether the limit gets crossed or not. Once the limit gets crossed application will send appropriate notification to the user this module helps to keep control on electricity used.

4 Scopes:

A] Household purposes

This application can be useful for household purposes. The single house or society can use this application to track electricity consumption. The single house or society needs a limited amount of electricity for daily use . They can set a limit so the application will notify once the limit gets crossed. It helps to reduce the payable amount for the electricity bill at month end.

B] Industry Purpose

In industry electricity consumption is high so it is not possible to keep track of consumption manually. This application plays a very important role to keep track of electricity consumption. The generated analysis report will give a clear idea about electricity use so the administration can take appropriate action in order to save electricity as well as invoice.

5. CONCLUSIONS

The objective of developing this application is to detect fraud in electricity bills. In some cases, users aren't aware of Electricity consumption. With the help of this application users can understand the usage/Consumption of Electricity (Weekly, Monthly) or on a time-based basis. This Application also provides the electricity bill every month on which users can rely. Overall this application gives every bit and bytes information to the user about electricity consumption then the user can take appropriate action to reduce the use of electricity and save a payable amount.

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