

MES COLLEGE OF ENGINEERING, KUTTIPPURAM
DEPARTMENT OF COMPUTER APPLICATIONS
20MCA246 – MAIN PROJECT

PRO FORMA FOR THE APPROVAL OF THE FOURTH SEMESTER MAIN PROJECT

(Note: All entries of the pro forma for approval should be filled up with appropriate and complete information. Incomplete Pro forma of approval in any respect will be rejected.)

Main Project Proposal No : _____
(Filled by the Department)

Academic Year : 2021- 22
Year of Admission : 2020

1. Title of the Project : Mobile Application For Electricity Meter Reading and Billing Using Image Processing
2. Name of the Guide : Prof. K P BALACHANDRAN
3. Student Details (in BLOCK LETTERS)

Name

Register Number

Signature

SHAHARBAN M P

MES20MCA-2047



Date:

Approval Status : Approved / Not Approved

Signature of
Committee Members }

Comments of the Guide

Dated Signature

Initial Submission :

First Review :

Second Review :

Comments of the Project Coordinator

Dated Signature

Initial Submission:

First Review

Second Review

Final Comments:

Dated Signature of HOD

Introduction:

Traditionally electric power utilities acquire the energy consumption information of users for billing through manual meter reading. With the advent of smart digital energy meters coupled, meter reading services have improved considerably where user energy data could be collected remotely through telemetry. In many developing countries where most electric energy meters are still post-paid or non-smart devices, the utilities continue to rely on physical inspection and recording the user energy consumption for billing. This method is tedious and prone to error and delays in customer bill preparations. This paper proposes a mobile application solution that involves taking real-time pictures of energy meter readings using a mobile device and transmitting the data to a central server to process and extract the user consumption information using an artificial intelligence engine. The mobile application allows users to enter details of the meter being read. The optical character recognition technology was used as the intelligence engine at the central server to extract the meter readings from the images.

Objectives:

Since these post-paid meters require manual readings of user consumption data, electric utilities rely on technicians or agents to capture the customers' premises' readings. The utilities sometimes face several challenges, such as wrong data readings, delays in submitting the data, fake or guess user readings, etc. These problems sometimes result in false reflection of actual billing costs. Electric utilities have relied on physical inspection of energy meters at customers' premises to acquire energy readings for customer bill preparation. However, with the advent of digital energy meters and smart grids [2], energy meters are now remotely read using telemetry systems. With the introduction of digital prepaid energy meters and other smart energy meters, electric utilities can now acquire users' energy consumption data for billing or system planning purposes through diverse technologies. In most developing countries, post-paid or analogue energy meters constitute a higher proportion of installed meters. This situation may be attributed to the cost of smart energy meters. The proposed solution consists of two functional units; a mobile application and a back-end server application. The mobile application, which runs on the Android operating system, serves as the primary means for the user to access. On the other hand, the server application hosts the application database, application routes, feature extraction, and character recognition models. The mobile application was developed using Android SDK and Flutter, and the server was developed using the Python Django framework. The mobile application communicates to the server application using the hypertext transfer protocol (HTTP).

Problem Definition:

This paper proposes a mobile application solution that involves taking real-time pictures of energy meter readings using a mobile device and transmitting the data to a central server to process and extract the user consumption information using an artificial intelligence engine

Automatic meter reading (AMR) is the technology of automatically collecting consumption, diagnostic, and status data from energy metering devices and transferring that data to a central database for billing, troubleshooting, and analyzing. This technology mainly saves utility providers the expense of periodic trips to each physical location to read a meter. Another advantage is that billing can be based on near real-time consumption rather than past or predicted consumption estimates. This timely information coupled with analysis can help utility providers, and customers better control the use and production of electric energy,

Basic functionalities:

The proposed solution consists of two functional units; a mobile application and a back-end server application. The mobile application, which runs on the Android operating system, serves as the primary means for the user to access. On the other hand, the server application hosts the application database, application routes, feature extraction, and character recognition models. The mobile application was developed using Android SDK and Flutter, and the server was developed using the Python django framework. The mobile application communicates to the server application using the hypertext transfer protocol (HTTP).

Tools / Platform, Hardware and Software Requirements:**Hardware Specification**

The selection of hardware is very important in the existence and proper working of any of the software. When selecting hardware, the size and capacity requirements are also important. The hardware must suit all application developments.

- Processor : i3 or above.
- System Bus : 32Bit or 64Bit
- RAM : 4 GB or Above
- HDD : 500 GB or Above
- Monitor : 14" LCD or Above
- Key Board : 108 Keys
- Mouse : Any Type of mouse

Software specification

One of the most difficult tasks is selecting software, once the system requirement is find out then we have to determine whether a particular software package fits for those system requirements. This section summarizes the application requirement.

- Operating System : Windows 10 Any 32 bit or 64 bit platform
- Front End : Python ,Android
- Back End : MySQL Sever
- IDE : Python 3.6 or above, PyCharm
: Eclipse or Android Studio