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E-SAVER

Save energy before its too late

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Abstract: *Nowadays the need for home energy use is increasing in almost all developing countries, the growing use of smart electricity meters means that real-time information relating to residential electricity consumption is readily available.This app provides a way for the user to save energy without any big risk. This project describes the development and preliminary evaluation of an application, implemented on a mobile platform (phone or tablet). This provides both an instant overview and awareness of consumption and availability, and facility to drill down to determine detail, and potentially to control individual appliances. Project implementation is in the form of mobile application with python language, XML, PHP, SQL, HTML and using android studio software, it includes daily energy consumption details and easy payment of electricity bill, and admin controls the electricity plans through a website. Controlling home energy consumption would exist as a stepping stone to handle many environmental problems . Not only these but also problems like of shootup in electricity bills can be resolved. A user interface based app for home energy management was developed, historical home energy consumption data can be visualised via the application and basing on this end users can alter their energy consumption behaviours.. Energy consumption data over a couple of past months can be compared and variations in consumption patterns assist home owners to draw out conclusions on energy use especially reflecting on the peak hours.*

Index Terms - E-Saver, XML, PHP, HTML, SQL,User, Smart Home, Historical and Real Time Data.

I. INTRODUCTION

TE-SAVER is an application system that provide information about energy use. It is difficult for energy consumers to know how much they have utilised over a period of time or even track their domestic live power readings. Our work aims on home energy managements system so that consumed energy data in homes can be collected and stored, user can pay the bill and an alarm is set to alert when the daily limit exceeds. This would allow visualization of this data via a web user interface based dashboard for further analysis and decision taking on energy use. The process of monitoring, controlling, and conserving energy in our homes is generally known as Home Energy Management, however it can also mean any device or a system in domestic premises that is employed to control energy consumption, the system involves identifying energy saving opportunities and providing required information to home owners that would influence their energy saving behaviours. Energy is not only on how it is supplied but also on how it is used. Presently , many countries encounter an imbalance between electricity production and demand. The impact of this difference is a remarkable rise in electricity prices. Effective energy management must be a continuous process, a sharp eye must be kept on energy consumption data at some fixed time intervals as unwatched energy management may become less efficient as time elapses. This prevents the long existence of a simple fault that may leave a huge energy electricity bill if not fixed. In short, E-Saver includes any product or service that monitors, controls, or analyses energy in the home as well as payment

of bill. This may include utility demand response programs , home automation services, personal energy management, consumed data analysis and visualization , auditing, and related security services.

II. SYSTEM DESIGN AND IMPLEMENTATION

The android studio platform is used for the app development, the python Language, XML code, SQL, PHP are further used in the implementation stages of the app. The work that would be done with the app will be that a user can login through app and can enter the consumer id and the details that are be pre-added by the admin cannot be changed. The user can choose the day limit of energy use , the display contain the information about energy consumption of individual appliances. Various functions such as connection request, register complaints, receive notifications, view bill as well as payment of bill can be done by using this application. User can set the daily consumption limit, if the limit exceeds an alarm will ring followed by offing over consumption device .The admin part is controlled by electricity board using a website, the website open with a login page were the admin can login the page using is ID and password. He can control all the tariff plans , generating bill, add notifications, view and reply complaints, view connection requests. The hardware included a clamp-on individual devices, a stand-alone display, a serial cable, and a web server. Power consumption is obtained using the Current Transformer unit, and transmitted to the display. The serial cable is then used to get the data from the display to our laptops (in this case it is the gateway and the web server at the same time). The application implemented collect readings from the CT unit, and show them via a web based application. The transmitter and the sensor jaw are integral to stand alone display functioning. The Energy Transmitter utilised has the following specifications: Product Size(12cm*7xcm*3 cm), with long lifetime replaceable battery. It can sense one, two and three phases. Operates at a frequency of 50 Hz and associated with sensor current sensitivity worth 50mA and has a maximum rated Current of 100A. The wireless Transmission mode is 433MHz SRD band with Digital Modulation. The installation of this device is very simple as it does not require any electrical wiring works. Basic electrical knowledge is required to set up this equipment. For instance plugging the display's charger, and clamping the CT on the cable through which power should be measured ,no pre- requisites required to use the transmitter. Data Logging and Storage Power readings were measured and transmitted by use of clamp on current transformers, this device is able to sense current in a current carrying wire on which it is clamped on and displays power in watts on a separate stand alone display. It therefore helps in the process of data measurement and collection, Various technologies were considered to develop the web application in this paper, including python and XML. Storage is enabled by the use of a MySQL database management system. All power readings data were collected and stored in a single main database table. Data retrieval in this system is based on java server page requests; SQL queries are utilised to get data from the database and via servlets is displayed in high chart plug-ins for historical and real time data visualisation we explain how raw power data were collected, stored and manipulated. Raw power is stored in a web server database, this enabled us to implement a web based and database. With MyEclipse we accomplished all the development works, Ajax and XML are employed to help us submit and retrieve data from severer without tampering the display behaviour of the dashboard. The developed app validates users via a register/login process. Users are requested to register their information and the identifications of the device used to collect raw power data which would uniquely identify the user A registered user should login to track his consumption details over a numbers of months and realtime data visualisation. As presented in the previous section , each user in this case the home owner is uniquely identified by consumer ID and password. In this scenario every user can login and access the app from where both historical and live consumption visualisation is enabled. As stated in the previous sections historical data trends directly initiates consumption forecasts in the endusers .

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