AUTOMATIC ENERGY METER BILLING WITH LOAD MANAGEMENT

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ABSTRACT
Automated and smart meters are devices that are ready to monitor the energy consumption of electricity consumers in real-time. They’re considered key technological enablers of the smart grid, because the real-time consumption data that they will collect and enable new sophisticated billing schemes. It could facilitate more efficient power distribution system operation and will produce to a spread of value-added services. At an equivalent time, the energy consumption data that the meters collect are sensitive consumer information. Thus, privacy may be a key concern and may be a major inhibitor of real-time data collection in practice. During this article, we review the various uses of metering data within the smart grid and therefore the related privacy legislation. This technique will alert the user through the user regarding the payment. If the user doesn’t pay the bill, the system will automatically trip the system.

Keywords: Value-Added Services, Real-Time Consumption & Meter Billing

1. INTRODUCTION
The electricity plays an important role in our life. Nowadays because the consumers are increasing rapidly it became very hard to handle the electricity requirements. Without electricity it’s impossible to survive and also it is vital many to avoid wasting technology to save many lots of the electricity loss. Because the generation is increases, the consumer’s requirements also increasing so in accordance with it the technology improvement is required. So, we developed the system with faster and improved technology IOT. Power theft could even be a measure crime and it also directly affects the economy of our country. Transmission, generation, and distribution are included to the loss of electricity. To avoid the losses, we’d wish to watch the power consumption and losses, so as that we'll efficiently utilize the generated power.

2. EXISTING METHOD
The energy meter will measure the energy employed by the user and sends the usage of energy to the controller. It doesn’t control the load. It only alerts the user through the user regarding bill. This technique will alert the user through the user regarding the payment. A LCD display is employed to display the measured value. As commercial use of electrical energy spread within the 1880s, it became increasingly important that an electrical energy meter, almost like the then existing gas meters, was required to properly bill customers, rather than billing for a hard and fast number of lamps per month.

3. PROPOSED METHOD
The energy meter will measure the energy employed by the user and sends the usage of energy to the controller. The user or the official can view the usage within the specific IOT website. This technique will alert the user regarding the payment. If the user doesn’t pay the bill, the system will automatically trip the system. If the energy meter will measure the energy employed by the user and sends the usage of energy to the controller. The controller will monitor the usage of energy 24/7 and update the measured usage value within the IOT. The user or the official can view the usage within the specific IOT website. This technique will alert the user through the user regarding the payment. If the user doesn’t pay the bill, the system will automatically trip the system. A LCD display is employed to display the measured value.
4. BLOCK DIAGRAM

4.1 ARDUINO UNO
Arduino UNO is an open-source microcontroller board supported by Microchip Atmega 328P controller. The board is given sets of digital and analog input/output (I/O) pins which can be interfaced to varied expansion boards (shields) and other circuits. The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE (Integrated Development Environment) via a sort B USB cable. It are often powered by a USB cable or by an external 9 Volt battery, though it accepts voltages between 7 and 20 volts. It is also almost like there Arduino Nano and Leonardo. The hardware reference design is distributed under a clever Commons Attribution Share-Alike 2.5 license and is out there on the Arduino website.

4.2 LCD
A liquid display (LCD) may be a flat panel display, electronic visual display, or display screen that uses the sunshine modulating properties of liquid crystals. Liquid crystals don't emit light directly. LCDs are available to display arbitrary images (as during a general-purpose computer display) or fixed images which may be displayed or hidden, like preset words, digits, and 7-segment displays as during a digital clock. LCDs are utilized in a good range of applications including computer monitors, televisions, instrument panels, aircraft cockpit displays, and signage. They're common by consumer in device like a video player, gaming device, clock, watches, calculator, and telephone, and have replace beam tube displays in most applications.

4.3 CURRENT SENSOR
A current sensor may be a device that detects current (AC or DC) during a wire, and generates a sign proportional thereto. The generated signal might be analog voltage or current or maybe digital output. It are often then utilized to display the measured current during a n ammeter or are often stored for further analysis in a data acquisition system or are often utilized for control purpose.
4.4 LOAD
Electric lights brighten our darkness, and lots of other uses of sunshine impact our lives daily. The solution, in short, is light may be a special quite electromagnetic energy. The speed of sunshine, although quite fast, isn't infinite. The speed of sunshine during a vacuum is expressed as \( c = 2.99 \times 10^8 \) m/s. Light travels during a vacuum at a continuing speed, and this speed is taken into account a universal constant. It's a carrier of electromagnetic energy and interacts with other discrete particles (e.g., electrons, atoms, and molecules). A beam of sunshine is modeled as a stream of photons, each carrying a well-defined energy that's dependent upon the wavelength of the sunshine. When ultraviolet light shines on some metal surfaces, it causes to be emitted. The photoelectric effect didn't produce results that matched the first predictions of undulatory theory. Two concerns were: 1. More intense radiation (larger-amplitude waves) didn't cause emitted electrons to possess more energy. 2. The energy of the emitted electron was hooked in to the wavelength of the sunshine, not the amplitude of the wave. Within the photoelectric effect, light strikes a metal plate. There is a minimum energy threshold for an electron to flee from the metal. Photons with frequencies below a given threshold eject no electrons, regardless of how intense the sunshine. Photons with frequencies above the edge do eject electrons, regardless of how low the intensity. If light were endless wave, it'd wash over the metal surface and interact with the electrons to offer them the needed energy to flee at lower light levels (intensities), but only after long delays. However, faint light at high frequencies (short wavelengths) caused the immediate release of electrons. Thus, light knocked the electrons out of the metal surface as if the sunshine were made from particles—photons.

4.5 GSM
If you're in Europe or Asia and employing a mobile, then presumably you're using GSM technology in your mobile. GSM stands for Global System for Mobile Communication. It's a digital cellular technology used for transmitting mobile voice and data services. The concept of GSM emerged from a cell-based mobile radio system at Bell Laboratories within the first 1970s. GSM is that the name of a typical ization group established in 1982 to form a standard European mobile telephone standard. GSM owns a market share of quite 70 percent of the world's digital cellular subscribers. GSM make went to the narrowband of your time Division Multiple Access (TDMA) technique for transmitting signals. GSM was developed using digital technology. It is a capability to carry 64 kbps to 120 Mbps of data rates. Presently GSM supports quite one billion mobile subscribers in additional than 210 countries throughout the earth.

4.6 RELAY
A relay is an switch that opens and closes under the control of another circuit. Within the original form, the switch is operated by an electromagnet to open or close one or many sets of contacts. It had been invented by Henry in 1835. Because a relay is in a position to regulate an output circuit of upper power than the input circuit, it are often considered to be, during a broad sense, a sort of an electrical amplifier.

4.7 POT
A potentiometer may be a three-terminal resistor with a sliding or rotating contact that forms an adjustable potential divider. If only two terminals are used, one end and therefore the wiper, it acts as a rheostat or rheostat. The measuring system called a potentiometer is actually a potential divider used for measuring potential (voltage); the component is an implementation of an equivalent principle, hence its name. Potentiometers are commonly wont to control electrical devices like volume controls on audio equipment. Potentiometers operated by a mechanism are often used as position transducers, for instance, during a joystick.
5. CONCLUSION

![Figure 2 Hardware Result for Automatic energy meter](image)

We are concluded that automated and smart meters are devices that are ready to monitor the energy consumption of electricity consumers in real-time. That specialize in the three uses of smart meter data, and its privacy aspects, we've reviewed cryptographic solutions for ensuring privacy-preserving management of smart meter data under the trusted operator model, and privacy-preserving solutions for processing under the non-trusted operator model.

6. REFERENCES


