International Journal on Recent and Innovation Trends in Computing and Communication ISSN: 2321-8169
Volume: 4 Issue: 5 422 – 424

A Reporting Engine & Application for the Electricity Board

Shweta A. Mohabe
[1]M.Tech,
Computer Science and Engineering,
JIT Nagpur, India,
mohabeshweta08@gmail.com

Abstract: First ABT metering system data are much fewer and sparser than traditional items, such as other things for recommendation. Second, every ABT system consists of many zones and other system which needed to be study and, thus, has intrinsic complex spatial-temporal relationships. For example, a travel package only includes the landscapes which are geographically collocated together. Also, different travel packages are usually developed for different travel seasons. Therefore, the landscapes in a travel package usually have spatial temporal autocorrelations; like that we need to develop a whole system for every possible results and problems. As ABT metering system is a heart of a whole Electricity board.

To address these challenges, in our preliminary work we proposed a cocktail approach on personalized ABT metering system and service recommendation. In the present cocktail approach, the extraction of topics is conditioned on both the service and the intrinsic features (i.e., areas, problems) of the substation. As a result, the cocktail approach can well represent the content of the service and the problems came on substation. Based on this cocktail approach is developed for personalized service recommendation by considering some additional factors including the problems invoke by ABT system, the services involved , and the start problem of new services.

Keywords: *ABT Metering System, JSON, traditional recommendation technique, substations, etc*

*****

.

I. INTRODUCTION

As an emerging trend, more and more companies provide and use online services. However, the rapid growth of online information imposes an increasing challenge for end user who has to choose from a large number of available service packages for satisfying their personalized needs. Moreover, to increase the profit, the companies have to understand the preferences from different user and serve more attractive services. Therefore, the demand for intelligent application services is expected to increase dramatically.

Since recommender systems have been successfully applied to enhance the quality of service in a number of fields it is natural choice to service recommendations. Despite of the increasing interests in this field, the problem of leveraging unique features to distinguish personalized service recommendations from traditional recommender systems remains pretty open. Indeed, there are many technical and domain challenges inherent in designing and implementing an effective recommender system for personalized service recommendation.

Third, traditional recommender systems usually rely on zonal implicit data. However, for ABT metering data, the implicit data are usually not conveniently available. Finally, the traditional items for recommendation usually have a long period of stable value, while the values of ABT system data can easily depreciate over time and a service usually only lasts for a certain period of time.

To address these challenges, in our preliminary work we proposed a cocktail approach on personalized ABT metering system and service recommendation. In the present cocktail approach, the extraction of topics is conditioned on both the service and the intrinsic features (i.e., areas, problems) of the substation. As a result, the cocktail approach can well represent the content of the service and the problems came on substation. Based on this cocktail approach is developed for personalized service recommendation by considering some additional factors including the problems invoke by ABT system, the services involved , and the start problem of new services. Finally, the experimental results on real-world travel data show that the cocktail approach can effectively capture the unique characteristics of ABT metering system data and the cocktail recommendation approach performs much better than traditional techniques.

II. Why the system is essential?

Security of supply and the ready availability of energy are becoming increasingly dependent on our ability to use energy resources carefully. Whist accurate energy meters are a must if the end user is to conserve energy, conservation is not possible without easy to understand energy usage information. Moreover, this information should be available to the customer in as near to real time as possible. To achieve this requires integrated systems or solutions that monitor and report energy usage effectively.

The system or solution will vary depending on the needs of the customer; understanding these requirements needs knowledge of both metering and of the energy supply chain. Over the years we have partnered with our customers to

understand their needs and brought our knowledge of energy measurement to provide them with meters and solutions.

This application is an online data acquisition and monitoring software used for Elite and Premier meters. It provides electrical energy parameters on real time basis and different reports for data analysis. This System Application is an effective solution for energy conservation and management of small metering installations. Software is applicable for energy audit and accounting, verification of energy conservation measures, system analysis, planning and management.

Salient features Software are as follows:

- Online data acquisition over RS-485 Modbus
- RS-232 is a standard communication protocol for linking computer and its peripheral devices to allow serial data exchange.
- Tabular and graphical views for online monitoring
- View historical data and is user friendly and flexible system
- GUI based software on Windows platform
- Supports MS access/ My SQL
- Real time alarms with e-mail
- Reporting module

III. How it works?

Here we use two major Protocols during development of software. The use of these protocols is different as per their characteristics.

- RS-485 Modbus
- RS-232

a. RS-485 Modbus

RS-485 allows multiple devices (up to 32) to communicate at half-duplex on a single pair of wires, plus a ground wire (more on that later), at distances up to 1200 meters (4000 feet). Both the length of the network and the number of nodes can easily be extended using a variety of repeater products on the market.

How does the hardware work? Data is transmitted differentially on two wires twisted together, referred to as a "twisted pair." The properties of differential signals provide high noise immunity and long distance capabilities. A 485 network can be configured two ways, "two-wire" or "fourwire." In a "two-wire" network the transmitter and receiver of each device are connected to a twisted pair. "Four-wire" networks have one master port with the transmitter connected to each of the "slave" receivers on one twisted pair. The "slave" transmitters are all connected to the "master" receiver on a second twisted pair. In either configuration, devices are addressable, allowing each node to be communicated to independently. Only one device can drive the line at a time, so drivers must be put into a high-impedance mode (tri-state) when they are not in use.

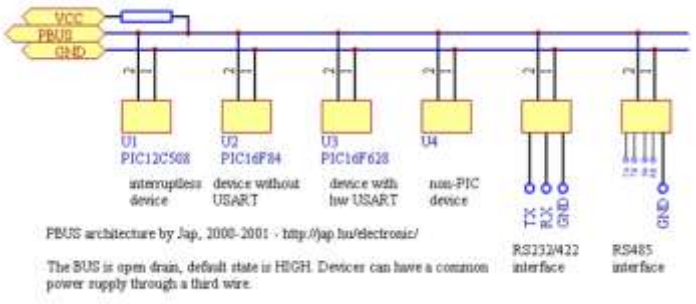

Fig 1: Block diagram of RS 485

Connecting a multidrop 485 network. The EIA RS- 485 Specification labels the data wires "A" and "B", but many manufacturers label their wires "+" and "-". In our experience, the "-" wire should be connected to the "A" line, and the "+" wire to the "B" line. Reversing the polarity will not damage a 485 device, but it will not communicate. This said, the rest is easy: always connect A to A and B to B.

Signal ground, don't forget it. While a differential signal does not require a signal ground to communicate, the ground wire serves an important purpose. Over a distance of hundreds or thousands of feet there can be very significant differences in the voltage level of "ground." RS-485 networks can typically maintain correct data with a difference of -7 to +12 Volts. If the grounds differ more than that amount, data will be lost and often the port itself will be damaged. The function of the signal ground wire is to tie the signal ground of each of the nodes to one common ground.

b. RS-232

The RS-232 interface works in combination with UART universal asynchronous receiver/transmitter. It is a piece of integrated circuit integrated inside the processor or controller. It takes bytes and transmits the individual bits in a sequential fashion in a frame. A frame is defined structure, carrying meaningful sequence of bit or bytes of data. It has a start bit followed by 8 data bits, a parity bit and a stop bit. Once data is changed into bits separate line drivers are used to convert the logic level of UART to RS-232 logic. Finally the signals are transferred along the interface cable at the specified voltage level of RS-232. The data is sent serially on RS232. Each bit is sent one after the other. This mode of transmission requires that receiver is aware when the actual data bits are arriving to synchronize itself with coming data. So logic 0 is sent as a start bit. The start bit in the frame signals the receiver that a new character is coming. Once the receiver acknowledges the next five to eight bits are sent which represents the character. This is followed by parity bit used for error detection.

Parity bit is used to specify even or odd number of one's in the set of bits. For error detection we add an extra bit to the data word. The transmitter calculates the value of the bit depending on the information sent and receiver also performs the same calculation. It checks the parity value to the calculated value. The stop bit helps the receiver to

identify the end of message. The start bit always has space value and stop bit has mark value. Now, if a receiver detects a value other than mark when stop bit should be present, it knows that's there is synchronization error. This causes a framing error condition in the receiving UART. The device then tries to resynchronize on new incoming bits. At the other end again the line driver interface converts it into UART compatible logic levels. At the destination, a second UART re-assembles the bits into bytes. This is how RS232 made the data exchange compatible and reliable.

Fig 2: Implementation of RS 232

Specifications of RS 232:

Fig 3: Specifications of RS 232

IV. Benefits of System

- Real time data acquisition over Modbus
  - Can be integrated with any meter supporting data transfer over Modbus Carbon emission analysis based on energy consumption.
  - Helps in monitoring the carbon emission & base lining the same Reporting Engine
  - Various reports are provided which are useful for analysis of an electrical system Facility to monitor & analyze multiple locations under single view using Virtual Meter concept
  - Virtual meters can be created based on requirement & monitoring can be done under single window
    Shift wise production data definition with reports.
  - Shift wise energy consumption can be monitored and can be linked with production output

V. Application

- Commercial and Industrial sub-metering applications
- Building management and monitoring systems
- Green Buildings for carbon monitoring
- Energy Management for commerce and industry
- Power plants

VI. Conclusion & future work

A whole sole system for the ABT metering system, which is used by Maharashtra State Electricity Board. The system can possess the all rights of invoked problems and solutions. Using our entire framework we are expected to design an application for the whole ABT metering system for Maharashtra State Electricity Board.
We are communicating the two different frameworks and fetching that data in an android application. This system can be handled by central server.We are thinking to advance this system by providing GPS location of each substation on android application.

References

[1 T. Tsumaki and T. Tamai, "Framework for matching requirements elicitation techniques to project characteristics," Software Process Improvement and Practice, vol. 11, pp. 505-519, 2006.
[2 H. Reubenstein, and R. Waters, "The requirements apprentice: automated assistance for requirements acquisition," IEEE Transaction on Software Engineering, vol. 17, no. 3, pp. 226-240, March 1991.
[3 How to Populate a Property Tree, http://www.boost.org/doc/libs/1_54_0/doc/html/boost_property tree/parsers.html
[4 Christian Lerche, NicoLaum, Frank Golatowski, Dirk Timmermann, ChristophNiedermeier: "Connecting the Web with the Web of Things: Lessons Learned From Implementing a CoAP-HTTP Proxy", MASS 2012, October 2012
[5 G. Adomavicius and A. Tuzhilin, "Toward the Next Generation of Recommender Systems: A Survey of the State-of-the-Art and Possible Extensions," IEEE Trans. Knowledge and Data Eng., vol. 17, no. 6, pp. 734-749, June 2005.
[6 F. Fouss et al., "Random-Walk Computation of Similarities between Nodes of a Graph with Application to Collaborative Recommendation," IEEE Trans. Knowledge and Data Eng., vol. 19, no. 3, pp. 355-369, Mar. 2007.
[7 Qi Liu, Enhong Chen, HuiXiong, Yong Ge, Zhongmou Li, and Xiang Wu "A Cocktail Approach for Travel Package Recommendation" IEEE TRAN. ON KNOWLEDGE AND DATA ENGINEERING, VOL. 26, NO. 2,278-293, FEB. 2014
[8 Philipp Wehner, Christina Piberger, Diana Göhringer "Using JSON to manage Communication between Services in the Internet of Things" 978-1-4799-5810-8/14/ ©2014 IEEE
[9 NikAzlinaNik Ahmad and NoorulIzathoolAkhbariee "Requirements Analysis of Android Application Using Activity Theory: A Case Study" 978-1-4673-4992-5/13 ©2013 IEEE