

# Electric power business hall on Mobile design and research

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**Abstract**—With the development of science and technology , the technology of Power and Supply is becoming more and more intelligent and automation. Wireless terminal technology has been widely used in the electric power business hall on Mobile.Mobile APP client terminal is based on the wireless network communication to realize the network design and can be compatible with the most popular Mobile phone in the market with the android platform and I-phone mobile, also can be increased to be compatible with Windows Mobile OS, Black-Berry OS and JAVA platform to be ready to meet the needs of more different customers . Such as Personal information management、Tariff and energy inquiry、Tariff receiving office inquiry and so on.This kind of service can contribute to improve efficiency and quality of service from the power supply department, which also can reduce the enterprise cost effectively and bring more convenient for customer's life.

**Keywords**- *wireless terminal ; Online payment ; Electric power business hall on Mobile ; IOS platform ; Service concept*

## I. INTRODUCTION

With the development of the economic society, the monopoly of the power grid to be broken and the concept of quality service to be strengthened , the idea of "high quality, convenient, standardization and sincerity" have deeply gone into the people's mind. It is key point for our today's marketing work that how to satisfy the customer, how to know the electricity condition used by the customer, how to accept the electricity generation by the customer, how to let the customer have more selectively payment in time. Compared with the previous way for tariff receiving in the office, micro-payments, withholding by financial institutions, the Lacarra POS machine and payment by the internet by personal self-help has increased, but it also dose not meet the needs of users in the store.

## II. SERVICE IDEA OF ELECTRIC POWER BUSINESS HALL ON MOBILE

Since July 1, 2012, the tariff of half Yuan per kilowatt-hour for the residents has been become history. The tariff for different time with "three-step has been used. Compared with the traditional tariff way for the residents by single price settlement, the new tariff policy was a new challenge to the idea of the resident for the electricity using. At the beginning of the new tariff policy, the business hall was always full of the customer whose could not accept the energy which they have used and the popular customer service phone number of 95598 always received the same complaints from the customer. They doubted that the energy which they have used has been stolen or the meter gone too fast. These reasons came from the new tariff policy not understood by the customer.

As the system of far-away data collected by remote and issued in one day and stopping sending system have been perfected day by day, the main problem is lack of tariff receiving office near the customer according to the survey to the customer from the power supply company. The related payment equipment is lack of portability, so that the tariff receiving office should be increased by the power supply company but the increasing and maintenance of the payment equipment will greatly add the cost of the power supply company and any machine has a certain system defects and the use time limited. The most customers only know that they owe the tariff after the outage because the reminding for tariff owed is missed by various reason and can not pay in time as the receiving office far from them. These will bring the inconvenience for the customer's life and business activities.

Although the residents of the general customers can through the online banking payment interface pay cost, but because of the limitation of bank business types, not all of

Banks can be useful for Liaoning Province customers pay. Although Alipay interface can not be restricted by bank, directly through an account to use any bank's online banking system to pay cost, but online payment operation after all need a computer and broadband network, once owe the power outage, will shut down the computer and network equipment, its still do not have the effect of boundary between. Handheld electric power client use of full coverage of the wireless phone network has incomparable mobility and convenience, no matter any place, any time, any environment, as long as there is phone network signal, customer can use electric power handheld client to query and pay cost. Owe the blackout occurs, the customer can through hand-held power back to normal after a client to pay electricity. 5 minutes was restored to the fastest time, greatly improve the power efficiency and quality service.

### III. MOBILE APP CLIENT TERMINAL EASY AND CONVENIENT

Mobile APP client terminal is based on the wireless network communication to realize the network design and can be compatible with the most popular Mobile phone in the market with the android platform and I-phone mobile, also can be increased to be compatible with Windows Mobile OS, Black-Berry OS and JAVA platform to be ready to meet the needs of more different customers.

#### A. Personal information management:

convenient to inquire the power user's Number 、 electric meter number and installation information of watt-hour meter, including user's name, installation date, address, capacity, etc. and the password can be inquired or modified.

#### B. Tariff and energy inquiry:

Connected with the synchronous interface of SG186 marketing system, the user can inquire the detail data of beginning and ending readings, energy and tariff of 6 months before the month meter reading day at any time..

#### C. Tariff receiving office inquiry:

The information of the tariff receiving office, Lacarra POS, ATM self-service payment terminal can be obtained by Google or Baidu map and the mobile phone location function

#### D. Information Subscription and inquiry:

The electric power service guide and prompt can be easily subscribed for or unsubscribed by SMS, MMS, such as reminding for tariff balance, energy exceeding the limitation, tariff owing and outage, recharging, outage, notice for planning maintenance and little knowledge for safety use.

#### E. Tariff payment by self-help:

The tariff can be easily and conveniently paid by users through network bank and Ali pay interface with bank debit card or credit card, and also can be paid through platform of Ali pay payment with mobile charging card, point card, mobile phone wallet, union pay (while Ali pay to provide recharging business).

### IV. THE OPERATION MODE OF THE ELECTRIC POWER BUSINESS HALL TERMINAL FOR MOBILE APP CLIENT

As the android with an open platform and IOS with a close platform, two platforms have different data interfaces so that the data from IOS must synchronize to ensure that users to recharge and recover the power supply in time with the IOS platform while the tariff owed and outage. The operation of electric power business hall terminal for mobile APP client is shown in Fig .1.

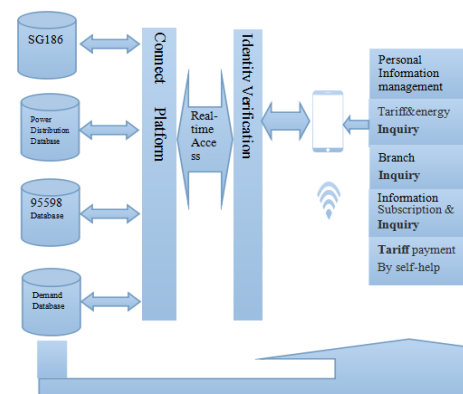


Figure 1. The terminal operation of the electric power business hall

#### A. Background System Design

The backend system design consists of four parts, i.e. the design for the system database server, the system application servers, the front end processor and the design of the firewall. In which, the system database server is the basis of the system data stored and operation. It is very important to the required data supporting storage system to work properly, realizing the different business systems and intelligent terminal data interchanging. The system data can be interchanged effectively with various business system data by system application server with the aid of data interface.

The system can be achieved by power supply bureau internal network and 95598 customer service system, customer credit risk evaluation system, electric power marketing management information system for data interaction. System frontend is main will be released the application of the system on the spot of intelligent terminals, such as PDA, mobile phone terminal, realize customer browsing. Firewall function is mainly to ensure the safety of network, generally it is set in a region with the mobile network interconnection.

#### B. Intelligent Field Terminal

The design focal point of intelligent field terminal is actual performance and expansibility as part of most closely contact with the customer.

The adaptability of the intelligent terminal needs to be taken into account to the field environment. The customer can click on one of the application program by the field terminal to realize the application of different functions.

### C. Communication Network Design

The idea of "Field Service" implement in depth by marketing system on mobile in basis of the wireless network communication. Based on the focal point of the business, the way of LAN combining with GPRS&EGPRS is chosen to realize the data interchanging between the database and the field terminal. The data can be exchanged between the intelligent terminal and the internal allowed access from the Power Supply Bureau on the specified web portal after the identification.

Within a LAN PC can access system corresponding system management, business management, also can undertake the corresponding business acceptance at the scene. GPRS/EGPRS communications intelligence field terminal from the geographical constraints, and the use of GSM private network or 3G network, data exchange with the background system. By power supply bureau and mobile operators optical fiber line access, connect with power supply bureau information system, at the scene of the through intelligent terminal authentication, on the basis of the power supply bureau internal network access, both guarantee the legitimacy of the visit, and realize the convenience of access.

### D. Software architecture design

Based on the current application of common MVC design pattern, system design of B/S structure, the software system is divided into three layers, namely, data display and business logic encapsulation, data access layer. Intelligent application terminal choose embedded browser, PC terminal choose to use IE browser, in the WEB services provided by the data access function, on the basis of effective call to access the database. This system USES JAVA, JSP, HTML language to develop, access to select the JPA data persistence layer, thus guarantee system can realize efficient operation, and conducive to the moving platform in the future. Using C language development intelligent field terminal embedded application, running environment for Windows Mobile system.

System design by using online connect wireless network and local area network (LAN), because of limited terminal data transmission protocol, and the need to adapt to the actual needs of the site office, its variability is large, so the first access to the site office by means of offline data needed, can effectively supplement the field office may use a variety of related data, also greatly enhanced the efficiency of data processing. In to the scene of the corresponding processing, off-line data can be uploaded to the online system, on the basis of examination and approval in accordance with input conditions it into the system database. Accordingly, in order to better realize the system function, the author design the two WEB sites based on HTTP protocol, a customer can realize local area network to access it, another can realize intelligent field under the condition of the terminal, with the aid of wireless GPRS network to visit at the scene of the work. Of which the former need to implement for the maintenance of the whole system, including the audit process, the functional management, rights management, etc., the main function of which is on the basis of the data interaction, the core

data are reasonable comprehensive online query, security field staff to grasp the overall information, including customer data, customer's electricity supply, etc.

## V. CONCLUSION

With the continuous development of information technology, the combination of electric power industry and information technology has become an important trend is unstoppable in the process of social development. Therefore, this article in view of the actual demand in the current power industry, combining modern PDA technology in the development of society, the design of the scene of the electric power customer service apple marketing system, and from the overall structure of the system design two aspects of design and the software structure of the overall research, the system of background information system, the design of the intelligent terminal and communication network are introduced.

The core function of electric power business hall terminal for mobile APP client is "self-help" and the self-support feature is its characteristics. The system of the data transfer and settlement in automatic background is the prerequisite for realization of the function with high efficiency and real-time. Since all the data for the tariff and energy is saved in the background server and responses the signals from a number of terminals at the same time, it should be established a powerful data server with a large middle library and a security system.

At present, the building of the remote payment platform for network bank and Ali-pay are improved gradually. The software system of the external network has been completed and it only needs to open interface to be put into operation. The internal network system of State Grid is now a separate from the internet. It needs to synchronously support from a large middle library to open the data of the tariff and energy and the firewall and other security system must be perfected. If electric power business hall terminal for mobile APP client is popularly used by the customer, the pressure will be reduced greatly for the man power tariff receiving office. The interval between the outage and sending will be significantly shortened. The more treasure time of electric power users will be save and the quality of service will be improved more.

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