Research on the Architecture Analysis of the Wisdom Water Water Charge System

Jiongming Zhu

Abstract— **This paper mainly studies the water fee revenue branch in the "Wisdom Water" construction system, adopts the Internet thinking to construct a service-oriented water fee fee collection system, and transforms the module into service through SOA service-oriented thinking. And the integration of the current popular Internet technology, the introduction of big data computing, from all angles to improve the timeliness of data analysis and user operations of the water revenue system**

Index Terms— **"Wisdom Water"; Water fee revenue; SOA architecture; big data calculation;**

I. INTRODUCTION

The concept of "Wisdom city" is the symbolic synonym of the current high-tech urbanization construction. Its essence is to use advanced Internet information technology to realize the intelligent management and operation of the city through centralized control of key information. People in the community create more convenient living facilities and a better living environment to promote the harmonious and sustainable development of the city. The development of "Wisdom city" relies not only on the enhancement and improvement of hardware facilities, but also on the construction of information technology. It is necessary to fully integrate the basic elements of normal operation in the city through informationization. Resources, through the Internet of Things, big data, cloud computing, artificial intelligence and other high-tech information technology to achieve optimal configuration, the most accurate calculations and the most reliable predictions. "Wisdom Water" is a key part of the "Wisdom city" system in urban water supply. The relationship between supply and demand of water resources is crucial for a city. How to effectively avoid excessive waste of water resources, accurately control the water quality of water sources, and fully implement the Internet + The water service revenue and payment fees are all research topics of "Wisdom Water" [2]. Among them, marketing payment is the top priority of water construction. With the impact of the Internet era, mobile internet is deeply rooted in the hearts of the people, and the user group is more inclined to pay the payment method without leaving the house. Then, the integrated integrated marketing system is equipped with mobile payment client. It is the central concept of a set of "wisdom revenue"[4].

Manuscript received Oct 11, 2018
Jiongming Zhu, School of Computer Science & Software Engineering, Tianjin Polytechnic University, Tianjin, 300387, China

II. OVERALL DESIGN IDEAS

2.1 Revenue business analysis

First of all, from the perspective of revenue management, the water fee collection system has a relatively complicated business branch system. The factors such as charging standards, charging methods, charging management, and reporting and repairing are all tailored to local conditions, and with the promotion of wisdom water meters, the meter reading method is also Gradually developed from manual meter reading to remote meter reading. The huge impact of the Internet era has made mobile payment into thousands of households. Its convenient and fast payment experience is more and more accepted by a wide range of users. Therefore, the water fee collection business needs to introduce mobile payment to make up for the traditional business hall. Insufficient payment.

The above mentioned water fee collection management work has regional differences, then the overall business must meet the relatively traditional door-to-door meter reading, business hall payment, and introduce a new Internet-style concept, equipped with remote transmission, remote control, far-copy mechanism and mobile Payment system. At the same time, a highly centralized marketing management and control platform is established in the background. The roles of each personnel are clearly defined[3]. The business modules are highly cohesive and low-coupling. The flow of each work order is clear and clear, and the management concepts of each responsibility are fulfilled.

2.2 Technical application analysis

Secondly, from the perspective of technical application, the integrated integrated marketing system + mobile client adopts the service-oriented SOA architecture, and the service-loaded application realizes high-cohesion and low-coupling software engineering design ideas among various business modules, which guarantees The data is independent of each other without losing the relationship between the data. In order to ensure the long-term availability of marketing data, the introduction of big data technology architecture, preservation of massive marketing historical data, and through the water revenue revenue big data platform calculation algorithm, can accurately analyze the historical account change curve, using data mining technology to achieve historical data synchronization Comparison and revenue forecast[9].

The mobile client is designed with ease of operation as the fundamental purpose, lightly streamlined design, and improved real-time response of the system. Both the staff and the paying user group provide real-time message push to ensure efficient operation feedback.

2.3 The goal of building

The overall construction goal of "Wisdom Revenue" is to build a set of intelligent revenue management system that

conforms to the "Wisdom city" development concept. It is a water management product integrating integrated revenue management system + multi-user mobile terminal APP[1]. The comprehensive revenue management system should realize centralized data management, realize the year-on-year analysis of revenue data, and predict the future requirements of intelligent platform, etc. At the same time, the mobile terminal APP is aimed at revenue workers, water users, and accurately locate users. , the APP design concept to achieve light process and simple operation.

2.4 Construction principle

The overall design principle of "Wisdom revenue" follows the design process of software engineering standardization, with demand-driven functions, functional model. establishment and business requirements to achieve a high degree of uniformity, while predicting the scope of business expansion and setting strict security mechanisms to implement software systems. Three standards: robustness, security, scalability.The following picture shows the marketing system function module[5].

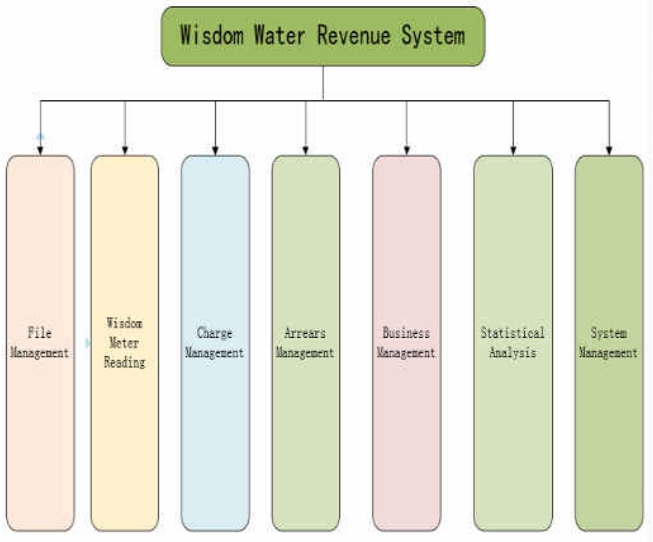

Fig.1 System Structure

III. BUSINESS ARCHITECTURE

Through the business analysis of the revenue system, we have designed the overall functional architecture as follows. Including: file management, intelligent meter reading, charge management, arrears management, business management, statistical analysis six functional modules[7].

For rights management, the system has strict permission settings, and different role rights are assigned to different staff members. The menus are assigned differently under each authority, and the duties are clear and easy to manage. At the same time, the system will provide a comprehensive log function to log the core business operations to prevent unnecessary losses caused by malicious operations.

IV. TECHNOLOGY ARCHITECTURE

According to the analysis of the business architecture of the marketing system, the use of a reasonable technical architecture according to different business scenarios not only improves the robustness of the entire system, but also ensures the portability, scalability and high availability of the system. Internet technology systems are relatively complex, and technologies such as big data operations, intelligent analysis, real-time message push, and caching mechanisms require corresponding technical frameworks to implement them. Using Netty as the message center, the millisecond message feedback mechanism guarantees good user experience. The management platform uses MongoDB as the business data repository, and the million-level data millisecond query also ensures good work efficiency[6]. Redis in-memory database as a data cache, avoiding IO pressure caused by high concurrency and realizing rapid data presentation[8].

V. CONCLUSION

This paper conducts business structure, technical structure analysis and research on the "Wisdom Water" revenue system, through the comprehensive analysis of water revenue business, from file management, wisdom meter reading, charge management, arrears management, business management, statistics Analyze the business content of the wisdom water revenue collection system from six angles, and realize it through the high-tech of the Internet, continuously improve the friendliness of users, and improve the security and accuracy of the system. For the statistics of water revenue data that users care about, system classification and time-sharing analysis and statistics of the revenue system data can accurately display the comprehensive overview of water revenue data and provide the most intuitive revenue data display. All business content required for a complete wisdom water revenue system.

REFERENCES

[1] Zhang Ren.Application of mobile phone meter reading system in township water supply enterprises[J]. Electronic world, 2018(04):67-68.

[2] Yang Guanglong.Analysis of the Factors Restricting the Development of Water Affairs Integration and Countermeasures[J].Water Sciences and Engineering Technology,2010(S1):63-64.

[3] Zhang Yi,Guo Quan,Wang Jianyong.A Neural Network Method for Big Data Analysis[J].Engineering Science and Technology,2017,49(01):9-18.

[4] Holden Karau. Spark fast data processing [M]. Yu Wei, Zhang Lei, translated. Beijing: Mechanical Industry Press, 2014: 47-84.

[5] Chen Qiang,Wu Jiajia.Research and Design Based on Netty High Concurrency IoT Server[J].Electronic Technology & Software Engineering,2018(07):34-35.

[6] Kristina Chodorow/Michael Dirolf. MongoDB authoritative guide [M]. Cheng Xianfeng, translated. Beijing: People's Posts and Telecommunications Press, 2011: 23-87

[7] Hou Min.Design and Implementation of Enterprise Marketing Management System Based on Mobile Internet[J].Automation & Instrumentation,2017(11):160-162.

[8] Liang Wei.The role and practice of computer network technology in archives management[J].Electronic e-commerce,2018(09):57-58.

[9] Ma Yuxing.Characteristics Analysis of Redis Database[J].Internet of Things Technology,2015,5(03):105-106.