Research on Business Cloning and Perception Technology Based on Big Data

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Abstract. In the era of increasingly developed economy, the core of enterprise development has been transformed into "customer-centric". Now, customers have become the most important resource of enterprises. The electric power company has a huge customer resource. It is of great value to mine the customer request resources collected from different channels to study the customer's satisfaction and demand for electric customer service.

Keywords: Perception Technology, Data Analysis, Business Cloning, Data Mining

1. Introduction
With the advent of the new economic era, the strategic center of an enterprise is changing from "product-centric" to "customer-centric", and customers have become the most important resource of an enterprise [1, 2]. With the development of the market economy, the market has changed from production-oriented to demand-oriented, from the era of products to the era of services, especially the advent of the e-commerce era, customer relationship management will become the core issue of competition among enterprises [3, 4]. To adapt to the requirements of competition, enterprises must change from a "product-centric" operating philosophy and method to a "customer-centric" operating philosophy and method [5, 6].

In terms of information security management, enterprises mostly focus on defense, adopt a defense-discovery-repair approach, conduct network penetration tests, and give risk assessments to find out possible vulnerabilities in information systems earlier, and use appropriate To fix vulnerabilities in a way, if an attack is found, network traffic, device logs, etc. must be analyzed to find out how to stop the attack. This way of defense puts the main energy on defense, and the situation is relatively passive. Faced with various types of information security, companies need to use threat intelligence technology, artificial intelligence algorithms, big data technology and other technologies to establish business cloning and perception systems. The core idea of this system is to make full use of network security data to comprehensively analyze the information security risks that may exist in the enterprise, and then to perceive the threats of the enterprise, and to best understand the information security situation of the enterprise. Network security data mainly includes Internet vulnerability monitoring data, open source threat intelligence data, and so on. Enterprise intranet data mainly includes enterprise service area logs, enterprise equipment operation logs, equipment security warnings, and network traffic data. The business cloning and perception system is to combine...
corporate intranet data and external network security data to judge existing attacks. It can also use risk assessment models to implement risk assessment of the entire network system based on dimensions such as asset vulnerability. And transmit this risk factor to the threat situation display module to display the risk. In the face of advanced and long-lasting cyber attacks, it is necessary to comprehensively search the historical data in the corporate intranet to find out the unknown risks in the intranet, and then display them through the situation module. During the operation of the business cloning and perception system, there are a lot of data monitored and searched, and it is necessary to analyze and judge it. This will involve a lot of calculations. For this reason, the system has established a distributed computing core platform.

2. Research on business cloning and perception data analysis based on big data technology

The rapid development of information and energy technology and the widespread application of big data technology are profoundly changing the customer service and innovation model of the power industry. The new generation of customer demand presents distinctive new features such as mobility (such as ubiquitous interconnection), virtuality, personalization (such as recommendation services), sociality (such as social media) and extreme data (such as rich media, big data). Especially from the perspective of the trend of important strategic technologies in the power industry, new computing models such as cloud computing, big data, and social network applications further highlight the deepening of these characteristics. The research introduces big data technology to analyze and mine customer needs in power customer needs, and plans to carry out research and application from four aspects:

1) Starting from customer needs, taking the two dimensions of customer power service life cycle and customer perception as the entry point, using existing customer service data and network crawling data for mining, through customer perception including safety, reliability, accuracy, Convenience and image, etc., research and establish an overall framework for comprehensive evaluation of customer needs evaluation based on customer perception. The realization of business cloning and perception analysis methods based on big data relies on more and more sophisticated data mining techniques. Data mining is divided according to its functions and applications, mainly including: classification, association, time pattern and clustering, which can be specifically applied to the analysis of customer group classification, customer background analysis, customer satisfaction analysis, and customer demand analysis.

2) Customer demand analysis and modeling based on customer perception is based on customer segmentation. Customer segmentation can adopt a classification method or a clustering method. For example, customers can be divided into high-value and low-value customers, and then determine the factors that have an impact on the classification, and then extract customer data with relevant attributes, and select appropriate algorithms to process the data to obtain classification rules. Using the method of clustering, you didn't know how many types of customers can be divided into. After clustering the data, analyze the result data to conclude similarities and commonalities. Customers of each category have similar attributes, and the attributes of different categories of customers are also different, so as to determine the interests, consumption habits, consumption tendency and consumption needs of a specific consumer group or individual, and then infer the next step of the corresponding consumer group or individual consuming behavior. As shown in Figure 1.

![Figure 1. Diagram of customer segmentation model.](image)

As shown in Figure 2, the clustering analysis method used for customer segmentation is developed from taxonomy. Clustering is to group similar data together to form a new category for analysis. The
method of forming clusters (clusters) of objects is to make the objects in one cluster have high similarity, but are very different from the objects in other clusters. Each cluster formed can be regarded as an object class, from which rules can be derived. With the gradual entry of multivariate analysis, cluster analysis gradually becomes independent and numerical classification, forming a relatively independent branch. Among the many clustering methods, the more commonly used hierarchical algorithms and the method of dividing the party are research hotspots. In recent years, the more popular partition clustering algorithms are K-means algorithm, fuzzy C-means algorithm, K-harmonic mean algorithm and spectral clustering algorithm.

Customer demand information changes dynamically with time. Currently, the commonly used analysis methods are to use one or more factors to make a single or comprehensive qualitative analysis of customer needs. This method cannot accurately describe the differences between customer needs. Only by combining qualitative and quantitative analysis methods can we make a real and quantitative reflection of customer needs. Customer demand analysis is to divide and cluster customers into many customer groups according to customer needs. The needs and desires of customers belonging to the same customer group are very similar; customers belonging to different customer groups have obvious needs and desires for the same product. The difference. The diversification of customer needs is embodied in two aspects: the diversification of customer demand for product functional attribute combinations and the diversification of different attribute levels. Customer needs can be described as a series of product attributes (mainly functional attributes), and each attribute is divided into different attribute levels. Different attributes and attribute levels are combined to form different demand modules, and finally a certain product is obtained according to product module planning and module combination. Modular combination products with the highest preference in market segmentation.

3. Business cloning and perception data analysis application system based on big data technology

3.1. System business application architecture
The main types of analysis are:

1) Customer type segmentation and customer demand analysis. Customers continue to evolve and exhibit a series of core attitudes, preferences and behavioral characteristics. These core characteristics together constitute the characteristics of a new generation of customers. Classify customers through these characteristics, and analyze the needs of different types of customers in a targeted manner. Starting from the dimensions of product innovation, customer interaction models, new partnerships, and the changing role of data in consumers’ daily lives, we will discuss in depth how power supply companies can adapt to key development trends.

2) Analysis of customer demands and complaints. Through 95598 log records, social network
customer appeal text analysis and customer voice recognition, combined with customer-related data such as production operation, planning and construction, comprehensive analysis of customer appeals and complaints, and clarification of current business weaknesses and problems.

3) Customer service interaction analysis. By tracking and analyzing the service traces of the same user on different service channels, we can grasp the service channel preferences and usage traces of users and customers, and find effective methods and service touch points to influence customers, providing services for business promotion, channel interaction enhancement and service channel guidance Real-time and quasi-real-time data support.

4) Analysis of user electricity consumption behavior. Through the collection and analysis of massive user real-time electricity consumption curve, load curve and other metering data, the user's electricity consumption behavior characteristics and patterns are clarified, and decisions are provided for guiding the development of orderly electricity consumption and demand side management.

5) Customer risk analysis and prediction. Through the attributes of multiple dimensions such as customer value, demand and behavior, conduct customer payment behavior analysis and electricity consumption habit analysis, build a predictive model to evaluate customers' arrears and electricity risks, and reduce electricity fee recovery risks and electricity safety risks.

6) Analysis of customer time habits. Based on customer files, call area and customer service records, intelligently analyze the time habits of interactive services performed by customers. Through big data analysis, look for customer service time habits.

7) Analysis of customer channel preference. Based on customer files, service sources and customer service records, intelligently analyze the channel preference behavior of a specific customer group, and establish customer channel preference tags, such as preference for telephone services, preference for WeChat services, etc., to carry out personalized services.

8) Customer sensitivity analysis. Based on customer files and customer service records, intelligently analyze the response frequency of a specific customer group to different incidents, and establish customer behavior labels, such as frequent complaints to customers, repeated repairs after failures, etc., to carry out targeted services.

9) Analysis of customer concerns. Based on customer files and customer service records, intelligently analyze the focus of a particular customer group’s focus analysis, and build a word model database based on received information and recorded-to-text call records, analyze the frequency of words, and find out the focus of customer groups’ concerns and trend.

10) Customer self-service operation habits. Based on customer files and customer service records, intelligently analyze the operation trajectory of a specific customer group in IVR automatic voice, website, APP, SMS and WeChat, find the law of customer operation and customer focus content, and then optimize self-service, and Provide personalized services to specific customer groups.

3.2. Data Architecture
Through the big data processing technology, these data are transformed into the data model required by the business, and the "information" and knowledge in the big data are discovered, and a large number of high value-added content value-added services are provided inside and outside the industry. Classify, plan, design, and deploy big data from different perspectives such as data characteristics, data sources, data acquisition methods, and data acquisition frequency.

3.3. Technical Architecture
The key technologies of big data include not only core technologies such as data analysis technology, but also important technologies such as data management, data processing and data visualization:

1) Data extraction technology. Data extraction is performed on the massive amounts of electricity data in the electricity consumption information collection database, and useful data is extracted and stored in the system data warehouse. The database construction method is different from the database of electricity collection and other online affairs. The data is mainly used for analysis, and the data design is designed according to the business-oriented design principles. The data of this system comes
5) Data analysis technology. Research the data mining technology based on the user's comprehensive perception analysis of the demand database, and perform data preparation, rule search and rule expression for a large amount of demand data. The main tasks of mining are data association, clustering, classification, anomaly analysis, specific group analysis and evolution Analysis, etc., in order to achieve accurate analysis of user needs, and provide technical titles for service and market development.

3) Data service technology. To provide data access services for the display client, the data service has an embedded memory cache database to improve data access performance. A variety of analytical data output interface interfaces provided by data services provide strong support for real-time display of power consumption changes. Research and establish an information interaction mechanism with social public resource platforms, and quickly push users' electricity consumption information and energy-saving plans to users.

4) Data presentation technology. All-round and multi-angle display of data. Learn from and apply the advantages of stock software, develop a fast display client application, propose a real-time dynamic display method of electricity consumption information from multiple perspectives of users, regions, industries, industries and time, display K-line graphs, electricity consumption trend graphs, etc., The client has local storage and real-time computing capabilities, making data presentation and indicator analysis faster.

3.4. Security Architecture
According to the specific business characteristics of the system, the security architecture establishes a strong information security protection system in accordance with the security requirements of the separation of internal and external networks of management information, which effectively protects the information security of the system and prevents attacks by hackers and illegal intruders. The security system applied by the system can be divided into two parts: technical security and management security. The security design at the technical level mainly includes application security, data security, system security, network security and physical security, among which application security is the core of the business security protection system. Safety at the management level mainly includes safety organization and personnel assurance, safety management system and safety technical specifications, safety assessment and supervision, etc.

5. Conclusion
This paper uses big data technology to analyze the needs of business cloning and perception, analyzes the identification and collection of service traces of individual user behaviors, the identification of user perception needs and the analysis of user perception needs, starting from the needs of customers, and serving life with electricity. The two dimensions of cycle and customer omni-directional perception are the entry points, and the existing customer service data is used for mining. The information security situational awareness system briefly explains its core technologies. This system greatly improves the enterprise's ability to perceive and detect threats.

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