

Construction of A Personalized Service Model of ABC Community Fresh E-commerce Based on Small Data

(Full Paper)

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ABSTRACT

The homogenization of products and services in the development of community fresh e-commerce is more serious, and providing personalized services to community customers has become a new development key point. From the perspective of small data research, this paper proposes an e-commerce service model that uses small data to provide personalized fresh products for community customers. Taking ABC community convenience store as the research object, the paper analyzes the application of community customer small data in the personalized service of community fresh convenience store to improve the loyalty and satisfaction of community customers and promote the development of community fresh e-commerce.

Keywords: small data, personalized service, mode, community fresh e-commerce.

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INTRODUCTION

According to the Ministry of Civil Affairs' "Urban and Rural Community Service System Construction Plan", the construction of smart communities in China has begun to explore in some areas, and the integration of informationization and community services has improved the satisfaction and comfort of community users. In the future, the development of urban and rural community service informationization in China will gradually form a pattern of network connectivity, application integration, information sharing, and rapid response. Community information construction promotes the development of various forms of community-based e-commerce. The development of community fresh e-commerce can provide community users with convenient and personalized fresh product personalization services. On the other hand, it also contributes to the improvement of community city management and community governance, and the development of community fresh e-commerce, Bring new business opportunities and profit growth points for property service units (Lu, 2017).

Community information construction has promoted various forms of community-based e-commerce. With the gradual improvement of the logistics and warehousing system, the community fresh e-commerce market has become the blue ocean, and emerged some O2O brands such as Bee Quick, Beiquan, 58 home and Hema stores. At the same time, the role of data is increasingly evident in the development of community-based e-commerce and the informatization of community services. The development of mobile networks, the popularity of sensor terminals such as smart phones and wearable sensing devices, make it easier to collect user behavior data (Qin & Zhen, 2017). Through intelligent devices, it is easy to record user's activity information and personal small data, which brings opportunities for the use of small data for community fresh e-commerce personalized services, and also promotes the transformation of community e-commerce personalized service model.

RELATED CONCEPTS

Small data

The concept of small data was first proposed by Professor Estrin, D., a computer professor at Cornell University in the United States (Estrin, 2014). By analyzing the social behavior data of his father before his death, he found that his father's life was different from usual, and inspired Estrin, D. to start research. Small data, looking for anomalies from the small data of daily life, puts forward the importance of small data, and uses small data as a new medical evidence (Chen, 2015).

Small data refers to all kinds of data generated by individuals in their daily production and living processes, including the customer's daily living habits, health change data, sports activities, social interpersonal situations, personal preferences, and other comprehensive data. The development of small data is inseparable from the maturity and perfection of personal data collection equipment such as monitoring equipment, sensor equipment and wearable equipment. Through the collection and analysis of small data generated by customers in e-commerce activities. Using small data to carry out user portraits of individual customers, to achieve the prediction of the user's social relations, purchase needs and life behavior. In the community fresh electronic commerce

activities, we can use the idea of small data analysis to collect personalized data from customers by collecting small data from community customers. The community's e-commerce customers' small data analysis framework is shown in Figure 1.

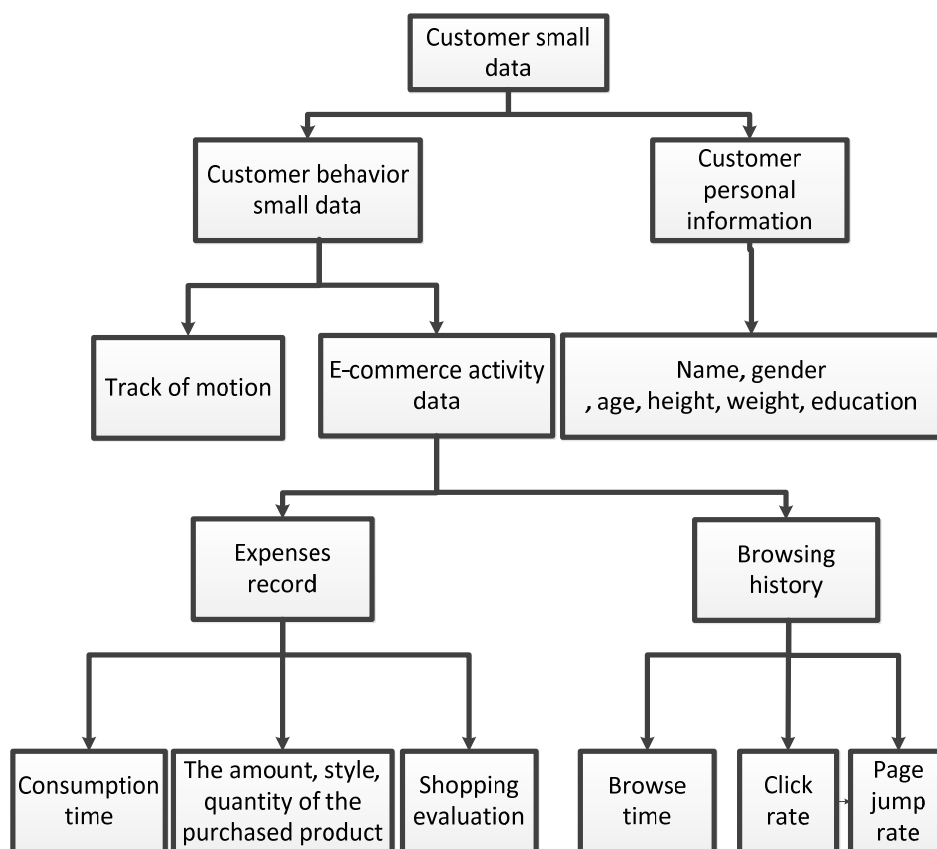


Fig. 1 Community E-commerce Client Small Data Analysis Framework

Community Fresh E-Commerce

The community refers to a community of social life formed by a certain number of population, a certain scale of facilities, and a certain characteristic of culture within a certain geographical range. The currently mentioned communities include naturally formed communities such as urban street communities, townships, natural villages, and urban-rural combinations, as well as communities formed by professional functions, such as university campuses, military garrisons, mining districts, etc (Lao, Zhong, & Tan, 2007). Community fresh e-commerce refers to the use of an e-commerce business platform or a combination of offline convenience stores to provide integrated services for fresh consumer products and after-sales services for customers in surrounding communities. The combination of e-commerce platforms and offline stores can provide customers with low-cost, high-performance commercial service activities, thereby better serving community customers and improving the quality of life of community residents (Zhang & Xiao, 2015).

According to the survey of China's Fresh Energy E-Commerce Industry Consumption Insight Report of 2018, at present, China's fresh e-commerce development model presents a variety of forms, mainly in the following four types: (1) Integrated e-commerce model. The integrated e-commerce platform increases the fresh product channel, adopts the traditional B2C sales model, usually adopts the platform self-operated, and also supports some third-party merchants to settle in. Representatives are Tmall Fresh, Jingdong Fresh and so on. (2) Vertical fresh e-commerce model. The vertical fresh e-commerce model is responsible for all aspects of production, processing, distribution and sales of fresh products. Although it is possible to obtain a price advantage in the supply chain of the control products, due to the heavy model and large investment, it is easy to encounter a crisis due to the problem of the capital chain. Representatives are Fruit Day, Yiguo Fresh. (3) O2O model. The community fresh O2O model is divided into two types. The first one is the offline fresh convenience store. By cooperating with the take-out platform, online sales are used as a channel for expanding business, mainly maintaining offline sales. The second is the self-built APP or the use of third-party software for the sale of fresh goods. In this mode, the merchants distribute through the distribution warehouse or the store, such as MISSFRESH, Baiguoyuan and so on. (4) Supermarket + catering model. Taking Hema Fresh as an example, this new retail model combining catering and fresh food is positioned as a mid-to-high-end customer. The main products are fresh and instant catering,

and the offline store undertakes the warehouse function, which can ensure the delivery time and reduce the cost, and also facilitate the processing of the fresh products at the end, reducing the loss. Among them, the latter two models have become the mainstream community fresh e-commerce operation mode.

CONSTRUCTION OF A PERSONALIZED SERVICE MODEL FOR COMMUNITY FRESH E-COMMERCE BASED ON SMALL DATA

The idea of constructing a personalized service model for community fresh e-commerce

Build a database layer for the community fresh e-commerce personalized service model

Build the database layer of the community fresh e-commerce personalized service model according to the behavior data and personal information of community customers. The main role of the database layer is to collect and store personal small data generated by community users in e-commerce activities through IoT devices, wearable data recording devices, mobile smart terminals, and information management service systems. The collected data is as comprehensive, accurate, and uninterrupted as possible. At the same time, it guarantees the security of data and ensures the security and availability of user data.

Building a Data Manipulation Layer for Community Fresh E-commerce Personalized Service Model

The data collected by the database layer is non-standardized data and cannot be directly used for data analysis and prediction. Need to use data fusion technology to process data, eliminate noise data, clean dirty data. Combine the data generated by customers online to carry out customer portraits to provide better decision support for consumers in the data service layer.

Build data service layer of community fresh e-commerce personalized service model

According to the customer consumption records and browsing record data in the community fresh e-commerce activities, the data service layer of the community fresh e-commerce personalized service model is constructed. Based on the processed small data, the community fresh e-commerce platform will be used at the data service layer to provide customers with personalized product customization and recommendation services. Use the information such as consumption time, amount, quantity, shopping evaluation, browsing records and other information recorded in the customer's consumption process to promote product prediction, and provide e-commerce users in the community with fresh product-related information services. At the same time, a user feedback quick response mechanism is established to solve the problems encountered by the user in the community fresh electronic commerce activities at the first time, and timely respond to the needs of the customers.

Community Fresh Food E-commerce Personalized Service Model Working Principle Based on Small Data

Customer small data collection layer

The content collected by the community fresh e-commerce customers' small data mainly includes the data generated by individuals in the community's fresh e-commerce activities and the data collected by smart terminals such as mobile wearable devices. The specific data content includes four aspects: First, the small data generated by the community in the daily production and life of users, and the tools for collecting data are mainly data collection equipment such as Internet of things devices, wearable data recording devices, and mobile smart terminals. The collected data includes user's exercise data, body blood pressure heart rate data, weight change data, etc; Second, the small data generated by users using the community fresh electronic commerce system, the collection tools mainly include the user transaction behavior record system, evaluation feedback collection system, information analysis system, etc. The collected data includes shopping records of the community users, product browsing records, consumer evaluation records, etc; Third, user data collected by the community management department collects tools mainly including community security monitoring systems, community user identification systems, and Internet of Things systems (Niu, 2016). The collected data includes the user's registered identity information, the time of use of the access control system, etc; Fourth, user data collected by social company groups, this part of the data is allowed to share by users. The collection tools mainly include network information management service systems, open service information systems, etc.

Customer small data analysis layer

The primary role of the community fresh e-commerce customer small data analysis module is to clean and integrate the data collected by the collection system. The data collected by the small data collection system comes from different collection sources. It is not standardized data and cannot be directly used for data analysis and prediction. The operation of the data processing system mainly includes four basic steps of data cleaning, data integration, data transformation, and data reduction. (1) Data cleaning is mainly to delete irrelevant data, duplicate data in the original data set, smooth noise data, filter out data unrelated to the subject, and process missing values and outliers. (2) Data integration integrates different types of data from different collection channels collected by the data collection system, logically or physically, to achieve data sharing. (3) Data transformation: When data is transferred from the data source of the collection system to the data analysis system, the data needs to be converted into a format that the system can recognize. (4) Data reduction refers to minimizing the data and improving the efficiency of the data analysis system on the premise of maintaining the original appearance of the data as much as possible.

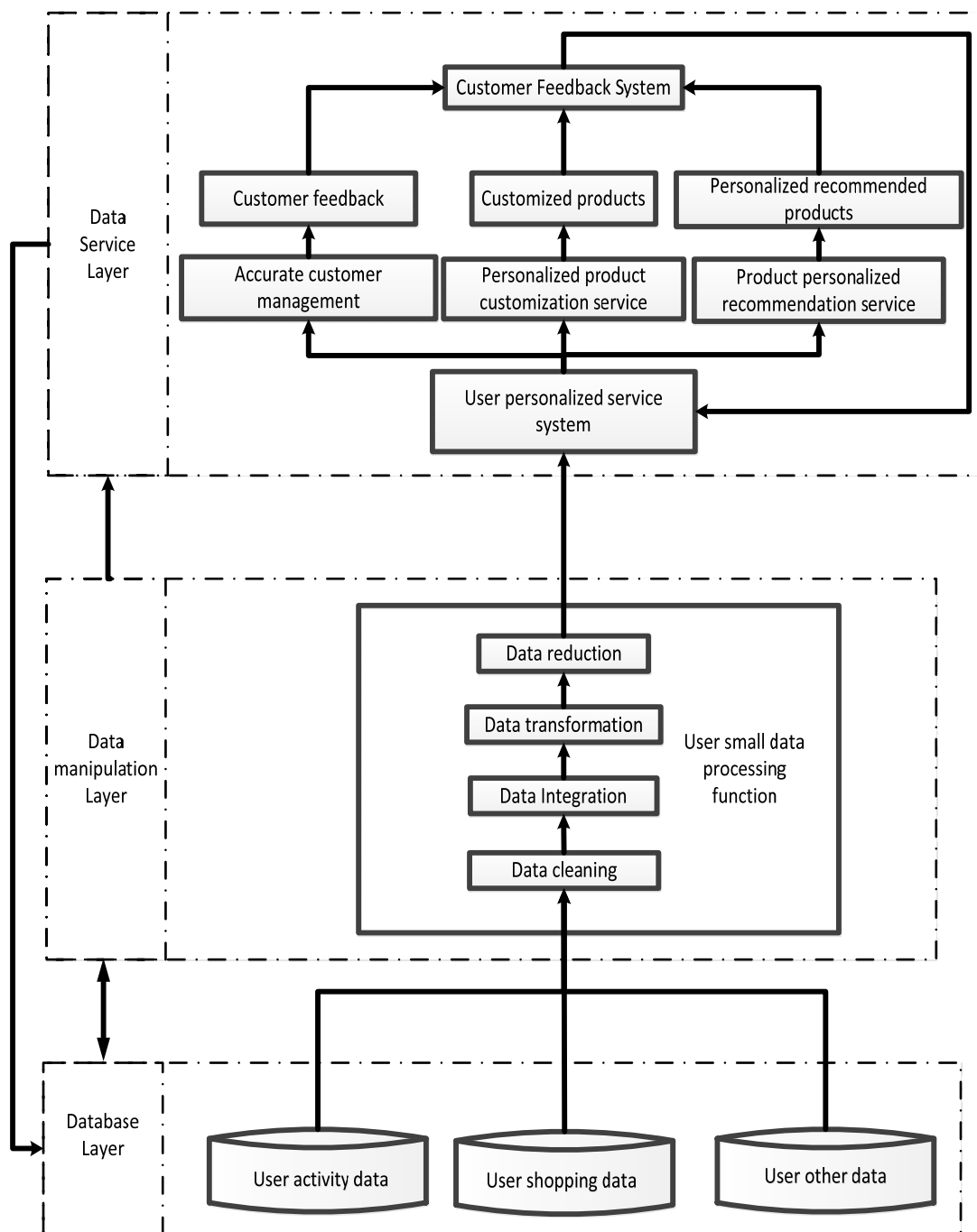


Figure 2 Community-based fresh e-commerce personalized service model based on small data.

Small data customer service feedback layer

The main task of the community fresh electronic commerce customer small data service feedback system is to carry out “one to one” service around the community customers, pass the consumer feedback information in the fresh electronic commerce activities to the analysis recommendation system, and optimize the recommendation service system. Feedback customer information is divided into positive feedback information and negative feedback information. Positive feedback information will be recorded in the personal database of community fresh e-commerce customers, positively reinforcing the forecasting effect of the data model. It will better realize personalized recommendation services for community fresh e-commerce customers and bring better consumer service experience to community customers. The negative feedback information will be used to modify the forecasting recommendation function of the data model so that the personalized service is closer to the customer's needs and the personalized product recommendation is more accurate.

ANALYSIS OF E-COMMERCE SMALL DATA PERSONALIZED SERVICE WITH ABC COMMUNITY FRESH CONVENIENCE STORE AS AN EXAMPLE

Community Fresh E-commerce User Portrait Based on Small Data

The ABC community fresh convenience store relies on a large community. The tenants of the community are mostly around 18-40 years old. They are engaged in civilian jobs, have strong spending power and have huge consumption potential. The ABC community fresh convenience store conducts online sales of fresh products through self-built APP and third-party software WeChat applets, and integrates offline consumption and online consumption data through the customer credit system.

The customer portrait is a detailed description of the customer's characteristic data. In the process of customer portraits of the ABC community fresh convenience store, including the basic characteristics and business characteristics of the community customers. ABC community fresh convenience store can collect basic characteristics data such as name, gender, age, income, and education level of community customers through the APP and WeChat client management system. The business characteristic data of community customers is accumulated in the process of community customers' shopping and shopping. The collection time is relatively long and the collection process is complicated. The collected community customer small data needs to be cleaned, integrated and analyzed with relevant data. According to the analysis results, the customer is provided with a customer portrait. The customer portrait feature description includes the customer basic feature description and business feature description. As shown in Figure 3.

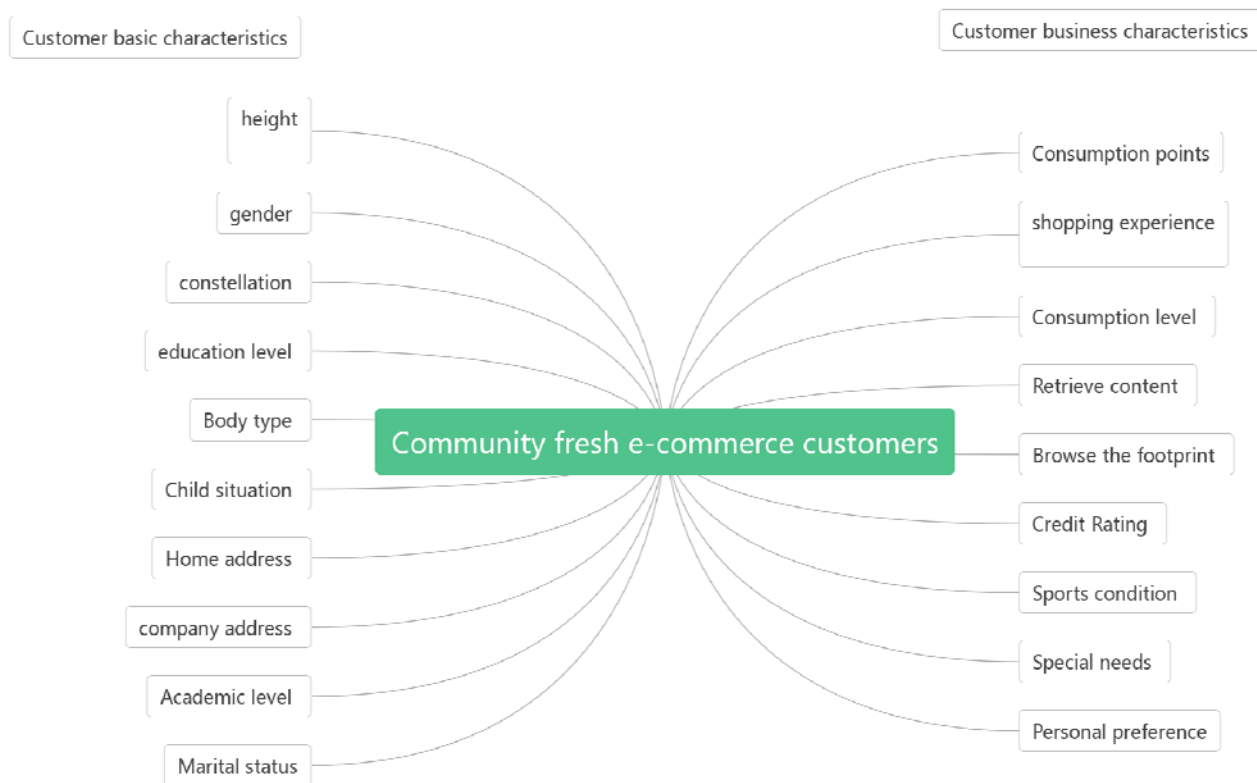


Figure 3 Community Fresh E-commerce Customer Portrait

Personalized service provided by community fresh e-commerce based on small data

Customer precise management

Customers are the most valuable core resource in business activities. Community fresh e-commerce customer maintenance is a long-term, mutual process, effectively maintaining high-quality customers and exploring potential customers. It is the most concerned issue for community fresh e-commerce operators. Based on small data-based community fresh e-commerce personalized service process, the collected community customer demand small data and personalized difference data can be used to classify customers into precise service sub-groups, and different sub-groups are adopted. Customer care strategy, carrying out different customer relationship services, through deep mining and analysis of small data of community customers, building customer value evaluation model and customer sub-group relationship management model, etc., can screen out high-end customer groups with potential value (Diao & Chang, 2018). The core concept of precise management of community fresh e-commerce customers is

“one-to-one” marketing. The customer small data analysis system can track and analyze the information such as customer browsing footprints and search content in the community fresh e-commerce activities. Recording, discovering the shopping preferences and consumption levels of community customers, better stratifying customers, and establishing a precise management system for community fresh e-commerce customers, as shown in Figure 4, adopting personalized marketing for different customers at different levels of consumption. Policy and service plan for one-to-one service.

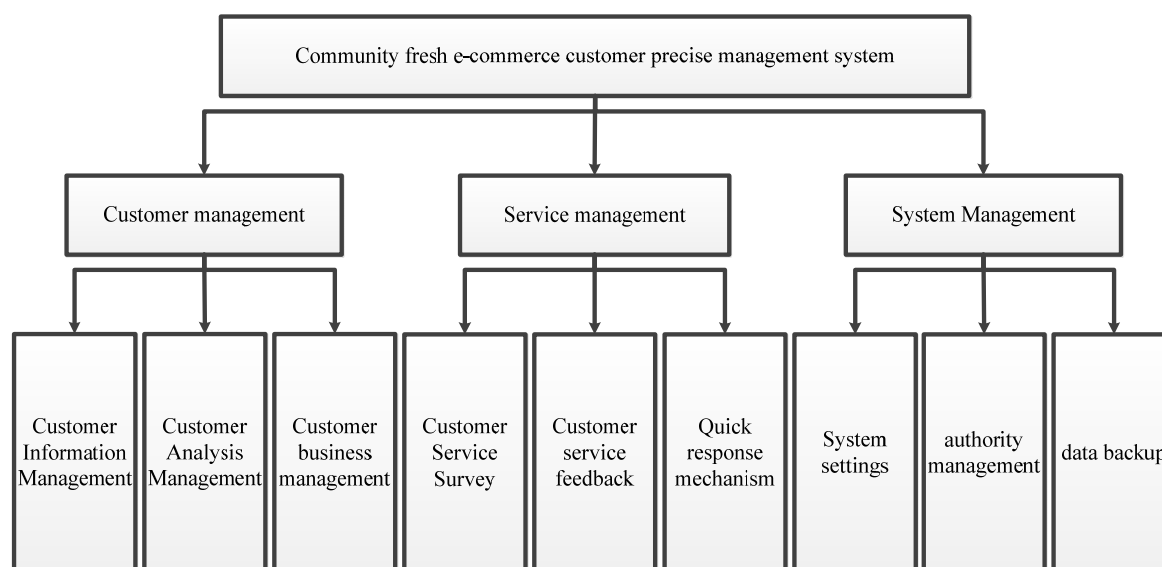


Figure 4 Precise management framework for community fresh e-commerce customers

After conducting a field visit investigation to the ABC community fresh convenience store, the fresh convenience store was managed by a third-party WeChat applet software. Through the membership card system and the offline cashier system for customer small data integration, the customer's online order information and offline consumption information are analyzed and promoted through WeChat, such as WeChat group message, WeChat private message, WeChat public article push and WeChat friends circle and so on. In terms of service management, A Fresh Convenience Store will be divided into large customers, medium customers and small customers according to the daily purchase of product points of community customers, and hierarchical management of customers, see Table 1. At the same time, the customer service personnel were trained to provide dedicated micro-signal feedback service for the customer service personnel. In the survey, 59% of the customers thought that the convenience store customer service could reply and solve the problem in time. In order to better protect customer information security, customer data of ABC community fresh convenience store is managed by small program platform, which can reduce the expenditure of data security protection and increase the profit of convenience store.

Table 1 Customer tiered management of ABC community fresh convenience store

Customer type	Member Points	Feature description	Marketing + maintenance method
Big customer	10,000 or more	The proportion of customers is generally small, but the consumption power is strong.	The store manager should record the customer information file in detail for such customers, and take the customer's birthday and special holiday as the entry point, and do regular greetings and visits, and maintain the frequency at least once a month. At the same time, parent-child activities, reading clubs and other exchange activities will be held to deepen the bonding between customers and convenience stores.
Medium customer	2000-10000	Customers should be the focus of training customers.	Create a customer WeChat group, focusing on daily WeChat interaction and daily phone calls to enhance customer loyalty. Invite customers to participate in parent-child activities, reading clubs and other exchange activities to deepen the bonding between customers and convenience stores.
Small customer	Below 2000	Customer spending is small, but the customer base is	First, the use of points redemption, deposit gifts and other forms of marketing, the second is to call by phone; the third is to use a group purchase and other forms of promotion for

		huge	customer relationship maintenance.
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Personalized product customization service

Advances in community building have made community customers less satisfied with traditional consumption patterns and are beginning to seek higher consumer experiences. Consumers have placed higher demands on the products and services of the community fresh convenience store operators. In recent years, food safety incidents have made many community customers consider not only product quality and price factors in the consumption process, but food safety and health issues have become a new focus of customer consumption. In order to meet the comprehensive consumer needs of community customers, it is necessary to develop personalized customer customization services based on small data. Through the community customer small data information and self-service Q&A robot, the customer service of the fresh convenience store can actively and quickly respond to the appeal of the community customers in the consumption process. The data sharing platform allows the customer to understand the positioning service of their products and solve the customer disputes in time, which is fast and convenient. Logistics distribution guarantees the freshness of the product, by coordinating online and offline resources, the information is guaranteed to be authentic and reliable, and the community customers' personalized product customization needs are deeply understood, and corresponding services are provided to improve the consumption viscosity of community customers and achieve sales improvement.

The customers of the ABC community fresh convenience store are mainly tenants from the surrounding communities, mostly young people aged 18-40. Mainly engaged in civilian, sales and management work, income is higher than the local average, willing to try new things, there are demand for personalized product customization. The types of goods provided by convenience stores include seasonal fruits, imported snacks, dairy products and package services. Take a customer as an example, and analyze the personalized product customization service process as shown in Figure 5.

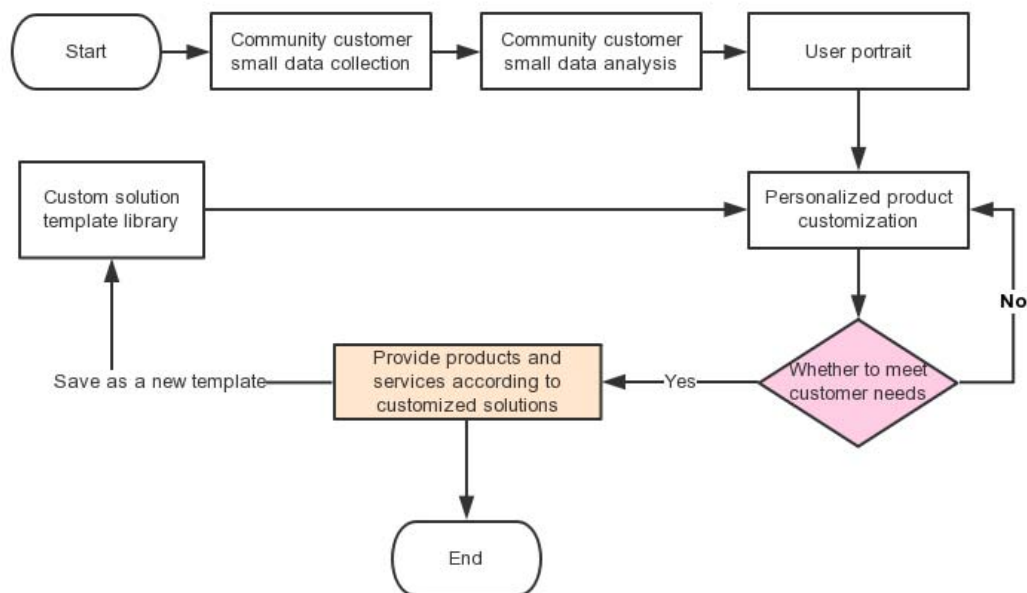


Figure 5 Customized product customization process for community fresh e-commerce customers

Personalized product recommendation service

The development of e-commerce in the community is rapid, the number of services and products offered is increasing, and the information generated is too cumbersome. In the process of facing users in the process of goods and services, customers often need to spend a lot of time to select their own needs. In order to reduce the time for community users to select products, the community fresh e-commerce personalized recommendation system can analyze the collected user data to conduct personalized product service recommendation. The personalized recommendation system is embedded in the user's e-commerce software. The user only needs to operate as usual, and the system automatically presents the required goods. Without the user input, the system can recognize the consumer preferences of the community users and provide accurate information for the community users.

Recommended service (Cong & Jiang, 2017). The personalized recommendation system is shown in Figure 6, including: user model, recommendation algorithm, and recommended target model. The user model is a user data image created by using community customer small data, and is a data collection of community customers in the network world. The recommendation algorithm is the most important part of the whole recommendation system. The quality of the recommendation algorithm directly determines the accuracy of the recommendation result (Ni, 2016). The recommended target model is the result of recommending the user model through the recommended algorithm, and is the simulation result of the computer's personalized demand for the user.

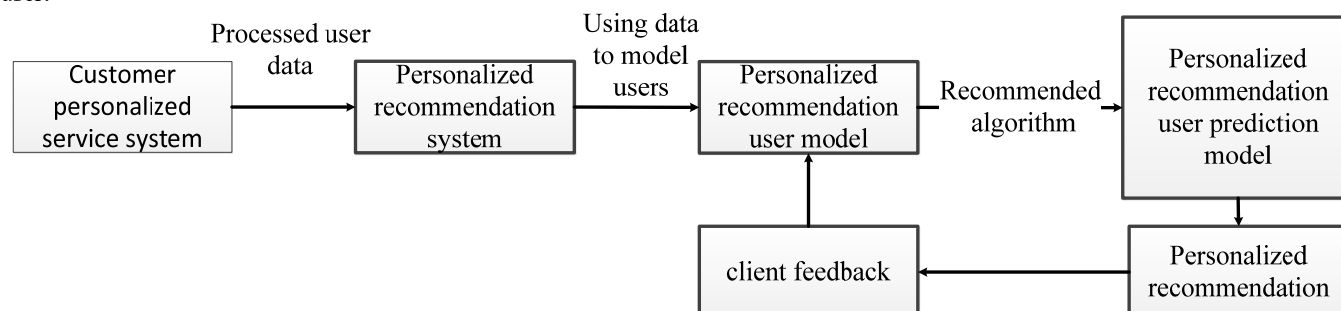


Figure 6 Personalized recommendation service model in community fresh e-commerce management

COMMUNITY FRESH E-COMMERCE PERSONALIZED SERVICE CONSTRUCTION STRATEGY BASED ON SMALL DATA

The community fresh e-commerce personalized service should be oriented to the needs of community customers, focusing on the comprehensive collection and processing of small data of community customers. Through interviews to investigate the e-commerce platform of the ABC community fresh convenience store, and found that there are some problems and imperfections, By strengthening the use of data in e-commerce activities, it will better guide community e-commerce operations and improve customer service satisfaction for community fresh convenience stores.

Strengthen the awareness of small data accurate customer service

Fully understand the importance of understanding customer small data in the community's fresh e-commerce activities. The customer small data in the community fresh e-commerce activities has always been a valuable resource, which requires deep processing and requires the corresponding team to track, integrate and develop, and form more valuable resources. It can help the community fresh convenience store more effectively to realize the personalization and precision of customer service. Provide solutions to customer problems encountered in consumer activities and push personalized services to consumer customers.

Building an Information Resource Library Based on Community Client Small Data

In the small-data-based community fresh e-commerce personalized service system, Through the comprehensive collection and processing of small data of customer groups, based on different types of small data resource bases, customer demand-oriented, through data integration, mining, encryption and other related processing processes, establish a corresponding small data information resource library. The community fresh convenience store can use the small data information resource library to communicate with customers from time to time. While providing strong data support, it can observe and tap the potential needs of customers in time to provide customers with more personalized services.

Refine classification and enhance customer care

Customer care based on small data is a long-term continuous interaction process, which requires the customer service team to communicate with the community customers continuously, so as to ensure the accurate delivery of customer service solutions and the high quality of customer service. According to the customer's demand for small data and customer group differentiation, the community customers are refined into sub-groups of precise services, and different data collection standards are adopted for sub-groups. Through in-depth mining and analysis of customer small data, build a customer value evaluation model, adopt different customer care methods for different levels of customers, maintain old customers, explore new users, and improve service quality while expanding customers.

At present, Customer-centricity has become the core content of community fresh e-commerce service system construction and service model change. It is also an important basis for community fresh e-commerce to increase customer satisfaction and loyalty. Therefore, through the analysis, prediction and judgment of community customer's small data, accurate customer relationship management has become an important factor affecting the community's personalized e-commerce service level. In order to enhance the accuracy and effectiveness of personalized recommendation services, the community fresh e-commerce platform should focus

on the individual needs of customers, constantly tap the customer's small data, optimize the recommendation algorithm, and improve the level of data analysis. Promote the in-depth development of community fresh e-commerce personalized services.

ACKNOWLEDGMENT

This research was supported partly by the following fund projects:

- (1) Shanxi Province's e-commerce specialty Jingao Jiao (2013) No. 16, Shanxi Provincial Department of Education.
- (2) Research on the development of characteristic agriculture in Shanxi based on e-commerce perspective, Shanxi Provincial Philosophy and Social Science Planning Office, Jin Regulation Office (2014), No.3.
- (3) Research on e-commerce visual design norms based on five-dimensional perspective, CCPIT commercial industry branch commercial informationization research "13th Five-Year Plan" 2016 project, commerce promotion word (2016), No. 30.
- (4) Research on e-commerce promotion project of characteristic agricultural products in Shanxi Province, research project of key projects of the Provincial Social Science Association from 2017 to 2018 SSKLZDKT2017047, Jinshe Lianzi (2017), No. 29.

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