Research on the Innovation of Cross-Border E-commerce Customer Service Model Based on Big Data in the Post-epidemic Era

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Abstract. In the post-epidemic era, with the rapid development of cross-border e-commerce, massive amounts of customer information data are generated every day. This article explores useful business information data, innovates cross-border e-commerce customer service model, optimizes customer service details, meets customer needs, and creates greater profits for the company. This article defines big data, expounds the 5V characteristics of big data and commonly used analysis methods, analyzes the positive impact of big data on cross-border e-commerce customer service, and the problems of big data application in cross-border e-commerce customer service, and proposes targeted cross-border innovations Countermeasures for e-commerce customer service model.

Keywords: Big Data · Cross-border E-commerce · Customer Service Model Innovation

1 Introduction

As a new format of foreign trade, cross-border e-commerce is booming. The new crown pneumonia epidemic has boosted online consumption, and domestic and foreign merchants have "global buying" and "global selling" through cross-border e-commerce platforms. In the past, the sales method of price competition has been unable to meet the consumer needs of customers. Cross-border e-commerce sellers are paying more and more attention to the service of the early stage of sales. Cross-border e-commerce customer service is an intangible activity that can bring certain benefits and satisfaction to customers. It uses the Internet to transmit information, receive customers, sell products, and solve customer problems, and generate massive amounts of data in the process [1]. Based on big data technology, this article analyzes the business data generated by the massive data of enterprise customer acquisition cost, unfinished payment orders, visitor value, purchase channels, etc., so as to obtain useful information to help enterprises make decision and operation management.

2   Big Data Technology and Common Analysis Methods for Mining

Global consumers' daily searches, clicks, browsing, sharing, likes, swiping cards, placing orders, returns, comments, and feedback on Internet platforms will generate a large amount of data, about 2.5 exabytes. IDC predicts that the amount of data will increase 10 times by 2025.

2.1   Characteristics of Cross-Border E-commerce Data

"Big data" refers to large-volume data that is difficult to capture, manage, and analyze with general software tools. New processing models are needed to have stronger decision-making power, insight and discovery, and process optimization capabilities [5]. Through analysis and mining of big data information, we can understand the behavior and preferences of customers, so as to implement precision marketing and consumption analysis. Cross-border e-commerce data has 5V characteristics, including large data volume, fast processing speed, multiple data types, high commercial value, and data authenticity. Table 1 shows the details.

2.2   Common Analysis Methods for Big Data Mining

Cross-border e-commerce can use data mining to perform highly automated analysis and processing of massive, incomplete, noisy, fuzzy, and random data generated by customers on the platform, and conduct inductive reasoning to discover valuable information, to help sellers and consumers adjust market strategies, reduce risks, and make correct business decisions. Common methods of big data mining include classification analysis, regression analysis, cluster analysis, association analysis, neural network algorithm, Web data mining, etc.

Table 1. 5V characteristics of cross-border e-commerce data

5V feature	Characteristic performance
Large data volume	Cross-border e-commerce has a wide range of data sources, and the data scale has grown from TB level to PB level and EB level.
Many data types	Including customer's basic information, comment records, consumption records, return records, feedback records, etc.
Fast processing speed	Customer behavior on cross-border e-commerce platforms is accompanied by customer data, which is often a high-speed real-time data stream.
High commercial value	Cross-border e-commerce data contains a lot of business value information. Using data mining can predict and analyze customer behavior and purchase expectations.
Data authenticity	The cross-border e-commerce platform records the customer's behavior trajectory. It is the actual and potential needs.

2.2.1 Classification Analysis

Classification refers to classification according to type, grade or nature. In other words, find a group of data objects with common characteristics from the database, and divide them into the same type, or divide them into different types according to data objects with different characteristics. According to different classification models, data items are mapped to given categories. For example, in cross-border e-commerce platforms, customers' activities within a period of time are divided into different categories, and related products are recommended to customers according to the classification. Personalized service, thereby increasing the sales volume of the store.

2.2.2 Regression Analysis

In big data analysis, regression analysis is a predictive modeling technique used to predict the relationship between the dependent variable (sales volume) and the independent variable (personalized service). For example, in cross-border e-commerce platform sales, the platform provides customers with targeted and personalized services, and uses regression analysis to predict the impact on store sales, so as to adjust marketing strategies based on the predicted value.

2.2.3 Cluster Analysis

The difference between cluster analysis and classification analysis is that the classes divided by cluster analysis are unknown. Objects in the same cluster have great similarities in data, and objects in different clusters have great differences in data. From a statistical point of view, cluster analysis simplifies the process of data through data modeling. In the cluster analysis of cross-border e-commerce data, the same or similar customer service is provided for objects with great similarity, and on the contrary, personalized customer service is provided.

2.2.4 Association Analysis

Association analysis refers to discovering the relationships and mutual connections between data items. That is, the behavior trajectory of one data item can be derived from the behavior trajectory of another data item. For example, on a cross-border e-commerce platform, customers have repeatedly clicked and searched for similar products and products of similar categories, and correlated and analyzed the customer's target products, so as to adjust the existing platform products.

2.2.5 Neural Network Algorithm

Neural network algorithm is a process of simulation based on human thinking. It is an advanced artificial intelligence technology with independent processing, distributed storage and high fault tolerance. It is very suitable for mining massive, incomplete, noisy, fuzzy, and random data.

2.2.6 Web Bata Mining

The Web is the world's largest public data source. Web data mining is to mine useful information from Web hyperlinks, web content and usage logs. Customers start by clicking on the cross-border e-commerce platform, clicking on the links, browsing web content, filling in forms, and generating data. This is an input process. Through Web data mining, hidden business value information is discovered. This is an output process. In fact, the Web data mining process can be regarded as the input-output mapping process.

3 The Positive Impact of Big Data Technology on Cross-Border E-commerce Customer Service

Big data technology is becoming more and more widely used in various industries. Customer service is the core work of cross-border e-commerce companies. Only by providing professional customer service can we adapt to changes in the industry and the needs of customers' individual needs, while enhancing customers Satisfaction with cross-border e-commerce companies. The positive impact of big data technology on cross-border e-commerce customer service is mainly manifested as:

3.1 Improve Customer Service Efficiency of Cross-Border E-commerce Enterprises

The application of big data technology in cross-border e-commerce customer service has its own advantages. In the process of customer service, the cross-border e-commerce enterprise platform will record basic customer information, including interactive information such as customer registration, browsing, clicks, purchases, and comments. Use big data technology to collect various data, and preprocess the data, apply the aforementioned neural network algorithm and Web data mining method to mine and analyze the data, analyze the actual needs of customers, and provide targeted and personalized services. To improve the efficiency of customer service for cross-border e-commerce companies, this is the cross-border e-commerce data mining process, as shown in Fig. 1. To provide customers with personalized services, we must start from every aspect of the order, always pay attention to customers' shopping psychology and needs, and actively push services based on the results of big data analysis, so that customers can enjoy timely service, which helps to enhance customer loyalty to the company And satisfaction [4].

3.2 Changing the Customer Service Thinking of Cross-Border E-commerce Companies

The customer service model of cross-border e-commerce in China is still in the process of exploring and transforming, using big data technology to provide innovative elements for customer service, innovating and enriching the customer service mode of cross-border e-commerce enterprises. Merchants use big data technology to organize data, accurately grasp customers' consumer needs and consumer preferences, effectively change the thinking of cross-border e-commerce enterprise customer service, and change outdated
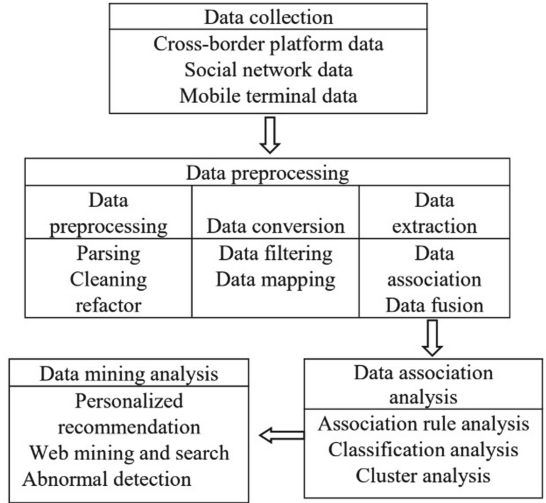
Data collection
Cross-border platform data
Social network data
Mobile terminal data

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Data preprocessing		
Data preprocessing	Data conversion	Data extraction
Parsing Cleaning refactor	Data filtering Data mapping	Data association Data fusion

⇩

Data mining analysis		Data association analysis
Personalized recommendation Web mining and search Abnormal detection	⇐	Association rule analysis Classification analysis Cluster analysis

Fig. 1. Cross-border e-commerce customer data mining process.

service content. For example, in the product push link, the company analyzes the data and information to grasp the customer's purchase intention, the type of goods the customer buys, whether it is high-end consumer goods, or daily necessities, whether it is pursuing branded products or practical products, so as to implement accurate push to provide customers with Effective and caring service.

3.3   Optimize the Cross-Border E-commerce Market Environment

The application of big data technology has made cross-border e-commerce market competition increasingly fierce. In the market competition of the survival of the fittest, enterprise customer service competes for the timeliness, meticulousness and effectiveness of service provision. Big data customer information analysis plays a key role. It explores the current and potential consumer needs of customers, provides benchmarking, and Customers provide timely and high-quality services, win the trust of customers, and optimize the cross-border e-commerce market environment while the company survives. Cross-border e-commerce companies absorb high-quality service talents, ensure that cross-border e-commerce companies develop talents, and make full use of big data technology to enable customers to have a homely customer experience on the cross-border e-commerce enterprise platform and meet the requirements of the development of the online market. Get praise from customers.

4   Analysis of the Problems Faced by the Application of Big Data Technology in Cross-Border E-commerce Customer Service

4.1   Insufficient Attention to Customer Demand Analysis

Cross-border e-commerce companies face unprecedented challenges of marketization and customer personalization. Only companies that can absorb advanced customer management concepts, use big data technology to conduct in-depth analysis of customer information, understand market dynamics, and grasp changes in customer psychology can they become winners in market competition. But in reality, because most companies do not understand big data technology, they only stay at the level of statistical analysis of customer data, and lack modeling for data mining and analysis. Therefore, most of the customer data is not fully utilized, and companies are still stuck in the traditional in the customer service model, customer needs are ignored.

4.2   Potential Security Risks in Platform Information Sharing

Cross-border e-commerce is a new format of "Internet + foreign trade", and a new international trade method developed based on the Internet. Network information sharing is an important feature of cross-border e-commerce. New products are released through cross-border e-commerce platforms and shared with customers in different countries for browsing and ordering. Because of this kind of sales method, it has a wide spread channel and platform information is easy to be stolen. In many cases, companies release products. Soon after uploading, it was copied by peer companies in a short time. Or the information communication between the production department and the sales department is not smooth, and the department's review process is complicated, resulting in the product release data not being updated in time in some links, laying a security risk for cross-border e-commerce customer management.

4.3   Inadequate Management of Laws and Regulations

Cross-border e-commerce has developed rapidly, but the legal and regulatory system for cross-border e-commerce has not yet been fully established. Although big data technology optimizes the cross-border e-commerce customer service model, it also has the problem of imperfect legal regulations. There is no on-site monitoring and communication between enterprises in different countries and between enterprises and customers. It is difficult to use Chinese laws to trace the source of products. As well as identification, personal information and rights protection of cross-border customers, just relying on platform information to leave a message is not conducive to supervision and review by regulatory authorities. Therefore, it is imperative to improve cross-border e-commerce laws and regulations as soon as possible, and establish transaction constraints between enterprises and customers Relationship and prevent illegal acts from happening.

4.4   Lack of Effective Customer Service Operation Mechanism

It is the only way for cross-border e-commerce companies to obtain customer resources through the Internet platform. The network is a cross-border e-commerce enterprise

operation and interaction platform, and the information of each merchant on the platform needs to be standardized and transparent, so that platform managers can collect and mine. The customer service operation mechanism of cross-border e-commerce platforms is not standardized, customer feedback is not responded to in time, or complaints are not resolved in time, which affects customer loyalty to the company. At the same time, human resource efficiency is the biggest management difficulty for customer service management facing new trade formats. Customer service cannot recruit a large number of staff. In order to effectively maintain the operation of the organization, the existing customer service operating mechanism must be reset.

5 Innovation Strategy of Cross-Border E-commerce Customer Service Model Based on Big Data Technology

5.1 Optimize Platform Services and Provide Personalized Services

The highly developed Internet has shortened the distance between merchants and consumers in all countries. Consumers in all countries can shop online anytime and anywhere, and the market space for cross-border e-commerce has been greatly expanded. More and more new customers enter the platform to browse, which also brings new challenges to the customer service work of enterprises. The application of big data technology in customer service work, merchants classify products hierarchically through the browsing and purchase records of new customers, adjust platform product types, optimize platform services, so as to meet customer product needs, and use big data technology at the same time Locate the level of customer needs, use the analysis results of information technology, use advertisements and product pushes, make personalized recommendations, tailor product procurement plans to customers, and provide accurate customer service standards, as shown in Fig. 2.

5.2 Establish Information Sharing and Improve Information Security Prevention and Control

For customers with purchase records, establish customer files and record customer service information. When customers have secondary needs, quickly recommend products.
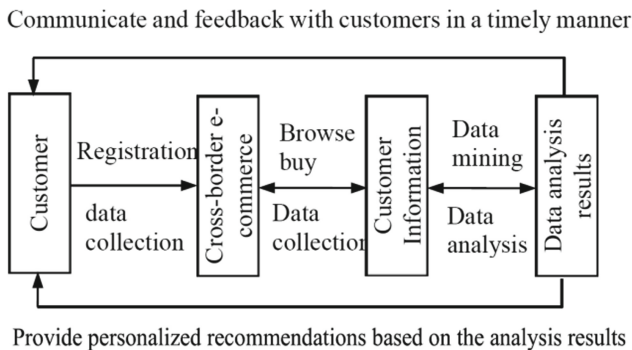

Fig. 2. Customer personalized recommendation.

At the same time, establish product sharing links with other companies. When cross-border e-commerce companies share product information, they always face the hidden dangers of the Internet, such as the duplication of released products and theft of customer information. For this reason, information security prevention and control must be improved. [2] It mainly includes 1. The information in the process of transmission and exchange is controllable and will not be modified or destroyed; 2. The customer's personal information is kept confidential to prevent unauthorized persons or entities from obtaining information; 3. The security performance of the network information system is improved.

5.3   Improving Laws and Regulations to Improve Customer Service Quality Management

Government departments have established sound legal regulations in the field of cross-border e-commerce, which is conducive to communication and interaction between merchants and customers, and guarantees a standardized and orderly cross-border e-commerce market. Customer service quality mainly includes the online store environment, service equipment, service items, service time, and service process. Through the customer journey of artificial intelligence and big data mining, the product needs are analyzed, from customer pre-sales inquiries to after-sales service links, the whole process of data tracking, collection of customer consultation and purchase data, analysis of customer purchase intentions, and customer feedback, Provide cross-channel customer service experience to meet customers' purchasing needs in a timely manner.

5.4   Establish Financial Management System and Optimize Service Operation Mechanism

Cross-border e-commerce companies manage by optimizing their own systems and establish platform operation systems and financial management systems. Especially at the beginning of the establishment of enterprises, standardized financial operations are carried out in accordance with national standards to facilitate the provision of true, reliable and real-time operating information, which can be used to improve the credit rating of cross-border e-commerce enterprises and reduce the operating costs of enterprises [3]. In terms of corporate cross-border sales, innovatively design customer service operation and management mechanisms, and make improvements in terms of service awareness, negotiation skills, system support, process optimization, system construction, etc., without the need to increase customer service personnel on a large scale and maintain high-level services. Live all negotiation opportunities and increase the order turnover rate.

5.5   Strengthen the Training of Cross-Border E-commerce Talents and Improve the Efficiency of Cross-Border Customer Service

The development of cross-border e-commerce is inseparable from talents. Cross-border e-commerce has high requirements for the overall quality of talents, requiring both foreign trade operation skills, network operation skills, and English communication skills.

Under the application of big data technology, the operation of all links of cross-border e-commerce is under effective monitoring, and cross-border e-commerce professionals with network characteristics need to be continuously explored and cultivated. Such transformed foreign trade talents have rich foreign trade experience, English skills, and network operation skills need to be strengthened. The course design mainly includes cross-border e-commerce practice, cross-border e-commerce customer service management, cross-border e-commerce supply chain management, cross-border e-commerce logistics management, and cross-border e-commerce data Courses such as management and business English help students studying foreign trade to meet the needs of cross-border e-commerce talents as soon as possible, especially cross-border customer service specialist technology, master network communication skills, use data analysis results to improve work efficiency.

6   Conclusion

In the post-epidemic era, the competition among enterprises in the era of big data is the management and use of customer information data. The behavior trajectories of customers on cross-border e-commerce platforms, such as browsing and purchasing, are recorded by big data throughout the whole process. Through data mining, customers' behavior characteristics, consumption needs, purchasing tendencies, product popularity, etc. are analyzed, and useful business information is extracted. In this way, we can make targeted product pricing, optimize service details, and formulate marketing plans to enable companies to win in fierce market competition. Companies can predict the future development and application of big data, boldly apply it in cross-border e-commerce customer service, and achieve innovation development of.

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