

Research on the Data Mining Tools and Algorithms of Cross-Border e-Commerce under the Atmosphere of the International Epidemic

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Abstract: China's cross-border e-commerce industry has developed rapidly, sales have risen steadily, policies and policies have been continuously introduced, e-commerce consumption mode has been continuously optimized, and logistics facilities are increasingly perfect. However, under the impact of the COVID-19 epidemic, the cross-border e-commerce industry has broken out with problems such as the industrial chain interruption, poor logistics chain, broken capital chain and insufficient talent export. In view of the challenges and opportunities faced by China's cross-border e-commerce industry under the impact of the epidemic, this paper analyzes the application of data mining tools and algorithms in cross-border e-commerce, aiming to provide certain help for the development of cross-border e-commerce under the international epidemic atmosphere.

1. Introduction

In 2020, China's cross-border e-commerce industry ushered in another "big test". In December 2019, COVID-19 (hereinafter referred to as COVID-19) outbreak, in order to effectively prevent the spread of the virus, resist the virus, on January 23, 2020, Wuhan took "closure" measures, and then, various provinces and cities have introduced closed management measures, in late March 2020, our COVID-19 outbreak has been basic control, March 25, Hubei (except Wuhan) removed traffic control, April 8, Wuhan unsealed. However, when the domestic epidemic was under effective control, the epidemic spread abroad rapidly. More than 60 countries around the world have entered a "seal" or state of emergency. At present, the global epidemic has spread to 212 countries and regions. At present, the international epidemic situation is still grim. Under this impact, China's traditional foreign trade was severely impacted. In the first quarter of 2020, China's total import and export volume fell by 6.4%. However, the cross-border e-commerce industry released huge development potential. In the first quarter of 2020, China's cross-border e-commerce revenue increased by 25% year on year. On May 6, 2020, the State Council issued about agreed to 46 cities and regions to Xiongan cross-border e-commerce comprehensive pilot zone approval, agreed to male district, Datong and other development potential of 46 new 46 cross-border e-commerce comprehensive pilot zone, China will have 105 cross-border electricity comprehensive pilot zone,

form land and overseas linkage, east-west development pattern, China's cross-border electricity industry into a period of comprehensive development.

2. Covid-19 to Cross-Border e-Commerce

Although from the overall transaction volume of China's cross-border e-commerce in the first quarter, it was not greatly affected by the epidemic, and also achieved a large year-on-year growth rate, but this number does not represent the situation of most cross-border e-commerce sellers. The growth of transaction volume is special during the epidemic period: from January to February, China imported a large number of masks, protective clothing and other epidemic prevention medical materials, resulting in a surge in imports; from March to April, with the domestic epidemic was effectively controlled and the comprehensive outbreak of the epidemic abroad, China exported a large number of epidemic prevention materials to various countries through cross-border e-commerce platforms. According to the statistics of Alibaba International Station New Trade Festival in March this year, the export of respiratory protection goods increased by 1142% year on year, respiratory, anesthesia and emergency equipment increased by 998% year on year, and medical and health care products increased by 304% year on year. At the same time, a large number of cross-border e-commerce sellers have declined seriously due to the impact of the global epidemic. The challenges brought by the epidemic to China's cross-border e-commerce mainly come from the following aspects:

(1) The state closure policy has led to the serious obstruction of international logistics

With the global spread of the epidemic, many countries have begun to restrict the entry of foreign personnel, ships and aircraft, leading to foreign buyers returning goods, causing huge losses to cross-border e-commerce sellers that have already prepared goods in China. In addition, logistics restrictions have suppressed the shopping demand of foreign consumers, and also made many Chinese cross-border e-commerce enterprises helpless. According to ningbo customs, the current 180 countries around the world issued personnel epidemic prevention temporary restrictions, more than 30 countries (regions) issued a temporary ban on import and export of goods, 40 countries (regions) issued port closure or temporary control measures, more than 80 countries (regions) issued delivery temporary measures. Such restrictions are difficult to change in the short term, but they will gradually relax as the epidemic improves.

(2) Low international flight seats and high prices lead to a surge in costs

Air transport business has been greatly affected by the epidemic. Airlines from various countries have significantly reduced or even stopped international passenger flights, resulting in a serious shortage of cargo seats and a large number of cargo backlog at airport freight stations. According to data shared by Gaojie Logistics, as the air cabin demand, air freight doubled, the international price in Europe and the United States rose from 20 yuan to 100 yuan, and Asia from 10 yuan to 40 yuan. The surge in air freight costs increases the cost of cross-border e-commerce and also suppresses consumers' willingness to buy.

(3) Restrictions on overseas warehouse entry and stagnation of local logistics will affect commodity distribution

Due to the outbreak, Amazon began an emergency stop of overseas warehouse services in the United States and the EU on March 17, excluding all other categories except individual daily necessities and medical products. The decision caught many Chinese sellers on Amazon off guard and rushed to look for other overseas storage services. Affected by the epidemic, local logistics and distribution systems in many countries are inefficient or even stagnant. On April 11, Express announced that due to the impact of the postal delivery affected by the destination country, Express will go off the production line to China Post and China Post registration packages in some countries

on April 13, and the recovery time remains to be determined. International delivery giants such as DHL, UPS have also suspended delivery services in certain countries. To avoid the risk of consumer complaints about delivery delays, AliExpress has extended the delivery time to 30 natural days.

The development of e-commerce cannot be separated from the strong support of logistics. If e-commerce goods cannot be delivered in time, then online transactions naturally cannot be carried out normally.

(4) Suspension and home isolation shall lead to a decline in the consumption capacity and willingness of foreign residents

More than 200 countries around the world have been attacked by COVID-19. Many governments have issued “home orders”. A large number of enterprises are on the verge of bankruptcy due to lack of income sources, while the masses faces the risk of unemployment and reduced purchasing power. The IMF forecasts the global economy to average 3% in 2020, with 6.1% in developed countries. Expectations of a recession and pressure on unemployment will partly curb consumer demand. In addition, due to the reduction in going out, residents' willingness to buy many outdoor supplies has decreased significantly, such as clothing and camping equipment.

At present, China's main destination countries of China's cross-border e-commerce is still in Europe and the United States, but they are also one of the regions most severely affected by the epidemic. Therefore, it can be predicted that if the epidemic in Europe and the United States does not improve for a long time, it will have a great impact on China's cross-border e-commerce.

The global recession caused by the epidemic is likely to last several years, and the overall decline in global consumption power is beyond doubt. However, declining consumer power will lead consumers to prefer good-quality and inexpensive goods, and perhaps increase consumers' preference for e-commerce shopping.

(5) Suppliers are at risk of bankruptcy

Due to the impact of the epidemic, a large number of export-oriented factories cannot receive orders, have no source of income, and may fail due to a broken capital chain. Every factory is a link in the industrial chain. Once closed, it is more difficult to repair, which will inevitably cause trauma to China's foreign trade supply chain.

(6) The rise of trade protectionism is not conducive to the development of cross-border e-commerce

Through this epidemic, China has once again proved its status as a global manufacturing power to the world with a complete domestic manufacturing chain. After many countries find that they cannot even make masks independently but must rely on being imported from China, they may step up the construction of their own industrial chains in the post-epidemic era to avoid possible national security risks. The construction of an industrial chain in China means that the country's dependence on international trade decreases, and reducing the number of imports from China is not conducive to the development of China's cross-border e-commerce. While countries can not be self-sufficient in the short term, the trade protectionism trend may rise after the end of the epidemic and lead to increased trade barriers.

3. Opportunities for the Development of China's Cross-Border e-Commerce Industry under the Covid-19 Pandemic

(1) China has increased policy support for the cross-border e-commerce industry

Although the outbreak of COVID-19 has caused a certain impact on China's cross-border e-commerce industry, during the epidemic period, the release of government policy dividends is undoubtedly a huge opportunity for China's cross-border e-commerce industry. As of April 7, 2020, the State Council has set up 105 comprehensive cross-border e-commerce test zones, covering 30

provinces, cities and autonomous regions. The preferential policies implemented in the cross-border e-commerce comprehensive trial area involve tax, finance, procedures and other aspects. In tax terms, the government taxed cross-border e-commerce businesses at a minimum income tax rate of 4%. VAT and consumption tax will be exempted from import and export goods that meet the regulations. In the financial aspect, in the face of cross-border e-commerce enterprises affected by the epidemic, the China Banking and Insurance Regulatory Commission has taken measures to appropriately reduce loan interest rates, improve the loan renewal process, increase credit loans, and help cross-border e-commerce enterprises tide over difficulties. In terms of the import and export procedures of cross-border e-commerce, relevant government departments have simplified the income and expenditure procedures of cross-border e-commerce enterprises, and adopted the policy of “simplifying classification and list inspection and release”.

(2) COVID-19 has promoted the warming of “house economy”, bringing hot demand spots for China's cross-border e-commerce

The novel coronavirus epidemic has caused the vast majority of countries around the world to take home isolation measures, which gave rise to a new consumption hotspot “home economy”. “House economy” mainly refers to working from home or doing business work, while using consumption at home. Including Yuancheng office, online shopping e-commerce, social community and so on. Under the influence of “house economy”, home office category, indoor fitness category, kitchen supplies and pet goods have been sought after by overseas consumers. According to Hugo's “Cross-border E-commerce Industry Research Report in the first quarter of 2020”, the most obvious decline affected by the epidemic is mainly outdoor products, including bags, shoes and clothing, while the rising demand is mainly epidemic prevention items, indoor fitness equipment and kitchen supplies, etc. In the Spanish market, sales of indoor sports equipment increased significantly, with total treadmill sales up 1,159% month on month and 500% for rally belt sales, according to AliExpress released in late March. “House economy” has brought new business expansion space for China's cross-border e-commerce enterprises.

(3) COVID-19 has shifted consumption from offline to online

The emergence of COVID-19 has closed or reduced passenger transport in most countries around the world, and the inconvenience of travel has shifted consumer demand from offline to online. On March 26, 2020, the Civil Aviation Administration issued a notice that it will further reduce international flights. The United States, the United Kingdom, Canada and many other countries took entry control measures on all passengers in March. On the one hand, the reduction of international passenger flights and the intensification of the COVID-19 epidemic abroad have prevented many consumers from going abroad to buy relevant goods, and have also restricted some overseas daigou behaviors. This prompts consumers to choose to buy the goods needed on cross-border e-commerce platforms. On the other hand, COVID-19 has led to the closure of a large number of physical stores at home and abroad, shifting consumers from offline consumption to online consumption. Primark,, a European offline clothing brand, has closed 11 European markets in Italy, Spain, France and 376 stores in the United States due to the COVID-19 pandemic, contrary to the massive increase in sales on the AliExpress platform. COVID-19 has further released cross-border online consumer demand and promoted the rapid development of cross-border e-commerce enterprises.

4. Application of Data Mining Technology in Cross-Border e-Commerce

Data mining techniques and algorithms are designed to extract important, potential information and knowledge through data analysis, processing and mining, and then converted into useful models, applied to research, production, operation and sales processes to solve the problems existing in

reality. Therefore, the application of big data technology in cross-border e-commerce can effectively solve the above problems.

(1) The Application of Data Mining Technology in Product Selection

As a business model closely combined with the Internet, cross-border e-commerce contains huge data, such as consumers' personal consumption data, merchants' operation and management data, commodity data, etc. Data climbing, data mining and analysis technologies can be applied to conduct data analysis based on the background data of cross-border e-commerce platform. Through statistical clicks, conversion rate, repurchase rate and commodity evaluation, analysis and predict which commodity will become hot style, so as to realize scientific product selection. For example, Amazon applies data mining technology to set up a Bigtracker selection library to help sellers create hot hot style. When the seller searches for commodity keywords, he will see all the data of the search results, such as average sales volume, average price, average ranking, etc., to visualize the product information. When the seller finds a hot style product, you can conduct tracking analysis, so that whether it is product selection or competitor analysis, are more applicable.

(2) Application of data mining technology in target group identification and consumer preference prediction.

In cross-border e-commerce, data mining technology can also be applied to solve the problems of target group identification and consumer preference prediction. Consumers have generated large amounts of consumer behavior data on cross-border e-commerce platforms. To be specific, consumer behavior can be divided into search behavior, browsing behavior, comparison behavior and purchase behavior. These four behaviors will be recorded by e-commerce platforms, search behavior produces search times, browsing and comparison behavior produce clicks, and purchase behavior produces the number of payments. Through statistics, comparing and analyzing these data generated by consumers, the platform can analyze consumers' purchase intention and consumption habits, and build a user portrait, so as to conduct target group identification and consumer preference prediction. For example, if Amazon, by analyzing consumer behavior, it can analyze the customer access page and transformation data, and predict the goods that may be purchased according to the title, shopping cart, customer search path, as well as unique recommendation algorithms. Relying on this technology, Amazon has become a leader in cross-border e-commerce in precision marketing and personalized customization.

(3) Application of big data technology in drainage promotion

Want to solve the problem of drainage promotion: the first step is to tap the data of commodity target users and potential users. In short, consumer groups who find goods through big data technology. For example, draw consumption samples, statistical analysis of consumption level, age distribution, gender ratio, etc., take different countermeasures for different consumption levels, age; the second step, establish consumer analysis model, model accurately lock target users, choose the target consumer, and the third step, establish targeted user data and media delivery suggestions, which is like the key words in the article, facilitate consumers to find on the platform. The purpose of drainage promotion is to lock the potential consumer groups of commodities, and carry out precise marketing and achieve transactions. This is very important for cross-border e-commerce, which merchants can obtain through data mining.

(4) Application of big data technology in cross-border logistics

① applies data mining technology and algorithm to optimize the distribution scheme and improve the timeliness of cross-border logistics

When customers buy goods, the effectiveness of cross-border logistics and distribution directly affects the shopping experience. At present, most cross-border e-commerce platforms have a long logistics delivery time, and It usually takes two weeks from the buyer to the goods to the buyer. The long wait makes the user shopping experience decline. Therefore, it is necessary to improve the

logistics delivery time. Cross-border e-commerce logistics can accurately find the most time-saving distribution route and distribution methods through data mining technology, integrate cross-border logistics resources, improve the level of transport capacity, and then improve the time limit of logistics distribution. This precise prediction can provide the best delivery solutions for merchants and buyers, shorten the logistics time, improve buyers' satisfaction, and promote the development of cross-border e-commerce.

②applies data mining technology and algorithms to change the cross-border e-commerce distribution mode

At present, the cross-border e-commerce distribution mode mainly includes international logistics, postal packages, third-party logistics, logistics alliance and overseas warehousing modes, among which the most used mode is third-party logistics and logistics alliance. The overseas storage model requires huge data computing power and financial strength, but also needs the establishment of a huge global logistics system. Amazon has built more than 50 operating centers around the world to store goods. Amazon has also launched “predictive shipping” technology, which delivers goods to the nearest operating center before customers place an order to reduce shipping time. With the development of time, this overseas storage model will gradually become a dominant position. In the construction of cross-border e-commerce overseas warehouse, logistics information technology should be adopted. Through data mining technologies such as correlation analysis and cluster analysis of logistics data, the functions of logistics customer relationship analysis, commodity association analysis and logistics market information cluster analysis should be realized.

5. Conclusion

In the future, data mining technology and algorithms will be more widely and in-depth applied in product selection, target group identification, consumer preference prediction, cross-border logistics and distribution, so as to realize the accurate operation and management activities of cross-border e-commerce and promote the sustainable development of cross-border e-commerce.

The current era is the 5G era of digital and cloud big data. Developed information technology has promoted the development of the society. For enterprises, the existence of information technology plays a very important role. Enterprise managers should have enough data information, and then analyze it under the big data mining technology to help managers to formulate qualified enterprise strategies and promote the healthy development of the enterprise.

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