



# A Probe into China's Cross-Border e-commerce Operation Model Under the Big Data View Domain

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**Abstract.** In the e-commerce industry, the traditional e-commerce data has been eliminated and replaced by big data with 5V (volume, variety, velocity, value, veracity) characteristics. The high-speed big data can quickly judge from many aspects and a large number of valuable data, and help the e-commerce industry improve marketing efficiency, customer experience. The benefits brought by big data to the cross-border e-commerce industry are self-evident. Starting from the development status of China's cross-border e-commerce in recent years, this paper deeply analyzes the business value brought by big data driven business services to cross-border e-commerce. Finally, it analyzes the integrated application mode of big data and cross-border e-commerce, and puts forward suggestions for the development of China's cross-border e-commerce industry.

**Keywords:** big data · Electronic Commerce · Cross border e-commerce · Operation mode

## 1 Introduction

In the context of today's big data, e-commerce can comprehensively understand users' browsing data, shopping habits, consumption range and payment ability through users' behavior data in the website, and classify users with different consumption habits and different levels, so that e-commerce websites can make corresponding adjustments to the production and operation direction of enterprises according to data analysis, The content of e-commerce website is presented to users in the way closest to users' preferences to maximize benefits. Now, such operation methods of e-commerce are constantly popularized to various enterprises and gradually expand overseas. The continuous development of big data enables cross-border e-commerce to easily formulate reasonable development strategies in different countries to meet consumer preferences.

## 2 Development Status of Cross-Border e-commerce Industry in China

China's total import and export trade has changed with the changes of the international situation, but the overall development trend is still rising. After the 2008 financial crisis,

the growth rate of China's import and export trade decreased significantly. From October 2008 to October 2009, the import and export trade volume continued to show negative growth. In 2009, the total import and export trade volume of China was only US \$2.2 trillion. In recent years, the growth rate of China's traditional import and export trade industry has slowed down, but with the continuous popularization and development of the Internet, China's cross-border e-commerce industry is booming, from the transaction scale of cross-border e-commerce market of 1.1 trillion yuan in 2010 to the transaction scale of cross-border e-commerce market of 12.5 trillion yuan in 2020. In the past ten years, the proportion of cross-border e-commerce trade in import and export trade has become higher and higher, as shown in Fig. 1 (data source: Ministry of Commerce of the people's Republic of China). Moreover, China has performed well in the fight against the epidemic, and many international orders have been transferred to China. Therefore, the upward trend of China's foreign trade in the next period of time may reach an all-time high, and after the global fight against the epidemic becomes normalized, other countries will rely more on Chinese goods.

### 3 Big Data Era

When the concept of cross-border e-commerce did not appear, most of China's import and export trade enterprises exchanged and placed orders through the platform of the China Import and Export Fair. At that time, the network was not developed, and the fluctuations of raw material prices, exchange rates and geographical restrictions made it impossible for enterprises to quickly obtain the latest information. Therefore, the communication attitude between enterprises is very cautious [1]. In the China Import and Export Fair, enterprises mainly focus on inquiry and obtaining commodity materials, and the transaction volume is not high. In recent years, with the development of the Internet and the maturity of big data technology, the China Import and Export Fair has gradually shifted from offline to online. Small and medium-sized enterprises can also have a broader platform, and the volume of transactions is also rising. With the occurrence of the third scientific and technological revolution, the keyword of the development of the times has become the Internet, the content of the network in life has become higher and higher, and the proportion of e-commerce platforms in people's consumption behavior has become higher and higher. Cross border e-commerce platforms are based on this foundation. The integration between big data and e-commerce has become deeper and deeper, and big data technology is becoming more and more important in the development of e-commerce enterprises. Big data technology can bring e-commerce enterprises accurate marketing positioning and service transformation to target consumer groups, avoid the cumbersome and lagging traditional marketing methods, bring bad impressions to consumers, and lead to poor marketing results. Big data technology has been widely recognized by many enterprises.

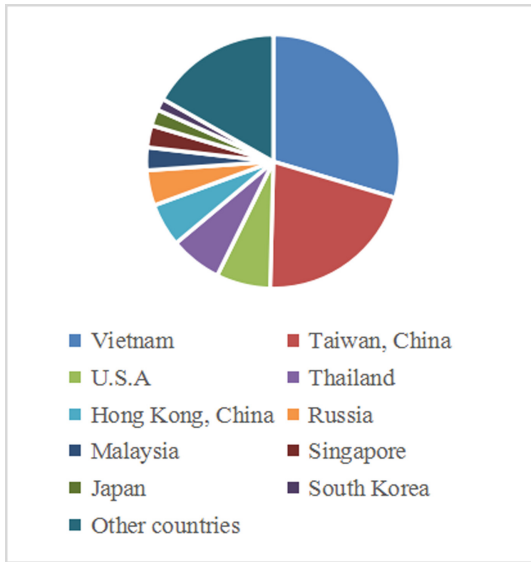
In recent years, China's Internet enterprises continue to develop, explore new fields, gradually stand firm in the international community and occupy an important position. As a new business model, cross-border e-commerce has the advantages of small geographical constraints and wide coverage, which is a good supplement to the traditional import and export trade. As can be seen from the 2019 white paper on China's cross-border e-commerce export trends and opportunities, due to the gradual globalization



**Fig. 1.** Changes in the proportion of China's cross-border e-commerce transaction scale in import and export trade scale from 2015 to 2019

of the supply chain platform represented by 1688 cross-border exclusive supply in the cross-border e-commerce industry, it is the most convenient and fastest way to purchase Chinese goods through the online platform in Southeast Asia around China, and many Southeast Asian enterprises even purchase from China at low prices High quality products, and then send them abroad. Among them, cross-border e-commerce users in Thailand and Vietnam like Chinese domestic high-quality goods the best (Fig. 2).

Compared with the traditional international trade model, cross-border e-commerce has the advantages of reducing transaction links and diversifying commodity categories, which is also one of the reasons for the rapid development of cross-border e-commerce. Compared with the international trade model, cross-border e-commerce is more flat. Manufacturers and consumers can have direct dialogue, reducing many intermediate links, which also reduces the cost of cross-border e-commerce and makes the price of goods cheaper to consumers. At the same time, manufacturers can increase profits on the premise of reducing transaction links. At the same time, the cross-border e-commerce's understanding of users' needs by big data is constantly changing with the trend of the Internet. The product information displayed by cross-border e-commerce is often more in line with consumers' needs, and there are a wide range of categories. Even if there are no goods displayed on the website in the production enterprise for the time being, it can start production in the fastest way after receiving the order, The development of the Internet has shortened the distance between Chinese products and global consumers. Cross border e-commerce can also grasp the opportunity of this era to broaden the international consumer market. The B2C (business to consumer) model of cross-border E-commerce makes the share of many export platforms led by Alibaba in the overall import and export trade market rise continuously, and develops together with the B2B (business to business) model platform.



**Fig. 2.** 1688 distribution of cross-border traffic exclusively for overseas visits (as of March 2019)

#### 4 Business Services Driven by Big Data

Big data is different from the traditional computer processing data. It is a massive, high growth rate and diversified information asset with stronger decision-making power, insight and discovery power and process optimization ability through the new processing mode [2]. Many enterprises can make relevant decisions on enterprise operation through the analysis of big data. Structured data Hadoop, NoSQL database with extensibility, machine learning and statistical analysis play a technical role in big data analysis. There is a central structure in the big data framework. Its talents and organizations use structured data and unstructured data to store, process and analyze data. Cross border e-commerce uses this structure to analyze and innovate the overall operation. Compared with the traditional RDBMS (relational database management system), NoSQL database has better data scalability and fault tolerance. NoSQL database takes distributed and collaborative work as the premise and stores unstructured text, video, audio, sensors and other data. Due to the complexity and large amount of cross-border e-commerce data, NoSQL database is a good choice for cross-border e-commerce [3]. In terms of data processing, Hadoop big data distributed processing technology and real-time data processing technology based on MapReduce are the two main technologies for cross-border e-commerce data processing. Hadoop big data distributed processing technology can process a large amount of unstructured data at high speed and flexibly. Under this technology, enterprises may be able to obtain valuable data information that could not be obtained before. Real time data processing technology in the process of data processing, the data is processed directly in the memory, rather than the traditional data processing. It needs to be input to the hard disk before processing. In this way, the advanced processing scheme can process the data more quickly and greatly improve the timeliness.

The core of big data is data analysis and mining. Data dimension analysis, data slicing, data drilling up and drilling down and other technologies in big data are the commercial value of big data. Cross border e-commerce can make full use of big data technology to obtain commercial value and make cross-border e-commerce develop more rapidly.

## **5 Impact of Big Data on Cross-Border E-commerce**

### **5.1 Customer Experience Optimization**

Due to the small storage capacity and slow processing speed of traditional data analysis, only a small part of the historical behavior data of e-commerce users can be retained. However, big data can store a large amount of data and process it very fast, so big data can analyze a large amount of historical behavior data of e-commerce users in real time. From the analysis of user behavior data, we can well grasp user preferences and optimize the customer experience. EBay is one of the earliest global e-commerce enterprises to use big data technology for data processing. The traffic of eBay website is huge and new transactions will be generated every second. Facing the daily 50 tb data storage and 100 pb data to be processed, eBay chooses to use big data to store and analyze the historical behavior data of users in the past two years, and then frequently adjust the website design, and use a/b test to verify through user experience feedback. Finally, it is decided whether the website modification should be determined. Finally, it is found that the test efficiency using big data has been greatly improved compared with the test efficiency after traditional data analysis. The test results only take a week or less, and the customer experience has been significantly improved.

### **5.2 Provide Customers with Personalized Services**

In traditional e-commerce, advertising has a wide range of delivery and coverage, but it does not necessarily focus on consumers' preferences and can not do precision marketing. However, the application of big data technology now allows e-commerce enterprises to segment users and accurately deliver different advertising marketing to different types of users. Big data can record the user's transaction data in detail and drill through the structural and non structural communication data, so that the obtained data is more detailed and personalized. Consumers can also independently design products on the e-commerce platform according to their preferences. Such personalized services undoubtedly bring convenience to consumers.

### **5.3 Commodity Fidelity Traceability**

In the past, fake and shoddy products often appeared in China's import and export transactions. The big data technology based on blockchain can well solve this problem. The blockchain's distributed data storage, point-to-point transmission, consensus mechanism, encryption algorithm and other computer technologies make the blockchain unforgeable, traceable, open and transparent. Cross border e-commerce can use blockchain technology to package and encrypt information such as product origin,

production process and transportation process. These data cannot be tampered with. Moreover, the chain structure of subsequent verification is constantly strengthening all the previous information contents to ensure the authenticity of the information, which also makes cross-border e-commerce goods more authentic and reliable [4].

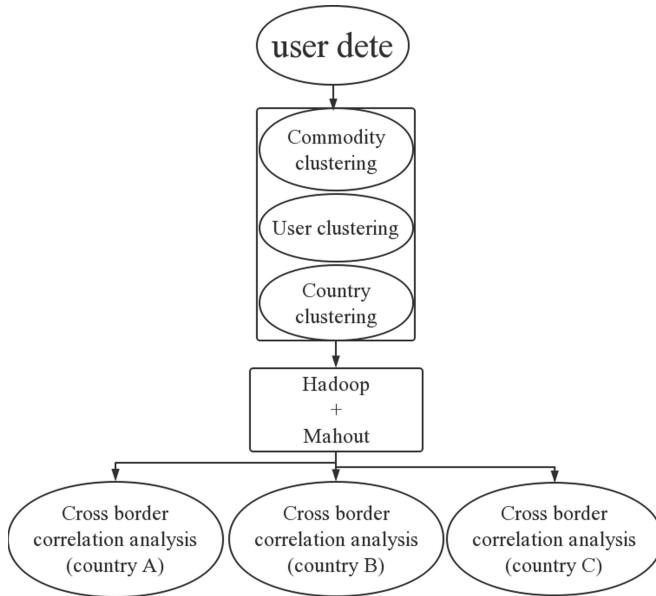
#### **5.4 Improve the Decision-Making Efficiency of Cross-Border E-commerce Enterprises**

Big data can be analyzed to judge consumer preferences, consumption volume, consumption time and other information. Cross border e-commerce can obtain the results of big data analysis according to the needs of enterprises, provide reference for enterprise decision-making, and facilitate enterprises to optimize customer experience through product adjustment and signs. Big data analysis can also provide customized and real-time information for consumers according to built-in programs and settings, forming an effective interaction between the platform and consumers. After network hot spots occur, big data will naturally refine keywords according to network hot discussions, and then push relevant product information to consumers. In this process, enterprises do not need employees to track network hot spots in real time. Big data technology can replace enterprises to make some decisions and help enterprises build a broad and deep market impression in the hearts of global consumers. In some big decisions, big data analysis can provide powerful references for enterprise decision-making, and greatly improve the efficiency of cross-border e-commerce enterprise decision-making.

### **6 Analysis on Application Mode of Big Data and Cross-Border E-commerce Integration**

#### **6.1 Cross Border Affiliate Marketing**

Affiliate marketing can make both enterprises and consumers mutually beneficial. Enterprises find the relevance of marketing practices such as commodities, brands and categories through big data analysis and processing to guide consumers' consumption. Consumers can also identify similar commodities more conveniently and find cost-effective products they need through affiliate marketing. E-commerce affiliate marketing mainly includes complementary relevance, alternative relevance and deep relevance. Complementary relevance means that when consumers look for the product they want, the e-commerce platform recommends the matching products directly related to this product for consumers. Substitution association is not only to provide consumers with the goods they want, but also to recommend similar and completely replaceable goods to consumers. Deep correlation is to emphasize the potential complementary relationship, understand the consumer's consumption behavior, and infer the products that consumers want to buy next. Affiliate marketing requires a lot of data analysis and calculation, and can trigger consumers' consumption behavior and improve the sales volume of e-commerce platforms. Therefore, cross-border e-commerce enterprises will make extensive use of big data technology in this regard. Cross border e-commerce enterprises conduct affiliate marketing based on distributed computing platforms and technologies



**Fig. 3.** Cluster + association analysis in cross-border affiliate marketing

to associate and push commodities with similar consumption levels and characteristics on cross-border e-commerce platforms to consumers, realize the optimization comparison or demand guidance of multiple products, and improve consumer satisfaction and overall sales of cross-border e-commerce platforms [5] (Fig. 3).

## 6.2 Cross Border o2o (Online to Offline) Experience Marketing

Cross border e-commerce connects online users and offline businesses through big data technology, guides consumers from online to offline for physical experience, promotes consumers to consume after experiencing products, and enterprises can further meet customer needs through consumer feedback. Compared with other e-commerce modes, cross-border e-commerce is more difficult to implement o2o mode. The construction of offline experience stores needs to fully consider consumers' needs, preferences and culture [6]. Moreover, the cross-border consumption data is full of various languages and social platforms, and the data collection is very difficult. The construction of o2o mode also requires the timeliness of data processing and analysis. Therefore, if cross-border e-commerce enterprises want to realize o2o mode, they cannot do without the support of big data technology.

## 6.3 Mobile + Social Big Data Marketing

With the continuous development of science and technology, Internet users are increasing. The consumer groups faced by cross-border e-commerce enterprises are those who account for a large proportion of the Internet in their lives. These consumers usually

have a lot of fragmented time to immerse themselves in the Internet and consume using mobile devices. Social and other daily activities. Consumers use smart mobile devices for a long time, and a large amount of information is obtained from the Internet. The development of social networks will produce a lot of social data, which brings new marketing ideas to cross-border e-commerce. Many people in Internet social platforms will share their shopping experience and recommend goods to others [7]. These information affect consumers' shopping decisions. Cross border e-commerce enterprises should try to use this information to have an impact on consumers' consumption behavior. The prevalence of social media enables people to communicate across regions, and cross-border e-commerce also has such attributes. The integration of cross-border e-commerce and social media can enable social media traffic to drive e-commerce commodity sales. The data generated by users on social media is very diverse. Big data can deeply analyze users according to a large number of unstructured data to obtain valuable information and judgment of users. In addition, netizens in many regions like to query commodity information on social platforms and solicit purchase opinions from other netizens. The full use of big data on social platforms by cross-border platforms can improve corporate reputation and sales, establish shopping circles and achieve substantial development.

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