



Research on E-commerce Development of Southeast Asian Products in the Context of "Blockchain + Artificial Intelligence"

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Abstract. The aim of this research is to explore the development issues of Southeast Asian product e-commerce in the context of "blockchain + artificial intelligence" and provide recommendations for sustainable development. Firstly, through the analysis of the global, Chinese, and Southeast Asian e-commerce market, this research reveals the scale, growth trends, and influencing factors of the e-commerce market in the region. Secondly, based on blockchain technology and k-means clustering analysis, the research studies data mining algorithms for e-commerce platforms and the development model of cross-border e-commerce based on blockchain. Using the Southeast Asian e-commerce platform Shopee as a case study, empirical analysis and strategic research are conducted on product categories. By optimizing product categories and formulating marketing strategies, the competitiveness of the e-commerce platform is enhanced.

Keywords: Blockchain. Artificial Intelligence. Southeast Asian e-commerce. Development Research.

1 Introduction

With the rapid development of information technology and the process of globalization, e-commerce has become one of the important engines driving economic growth and business development. Especially in the context of "blockchain + artificial intelligence," the e-commerce sector has encountered new opportunities and challenges. Southeast Asia, as a hotspot with a large population and a rapidly growing consumer market, has attracted the attention of numerous companies and investors. In this context, conducting in-depth research on the development issues of Southeast Asian product e-commerce is of great significance for understanding and grasping the characteristics and potential of the Southeast Asian market, as well as mastering technological innovation and business model transformation in e-commerce platforms^[1]. By applying data mining algorithms and implementing blockchain technology, we aim to explore more efficient and secure e-commerce platform construction. The goal of this research is to provide valuable references and guidance for the development of the e-commerce

industry in Southeast Asia, promoting its sustainable development in the era of "block-chain + artificial intelligence." Through in-depth analysis of the current e-commerce market, technological innovation, and business models, we hope to provide practical recommendations for Southeast Asian businesses and stakeholders, driving the vigorous development of e-commerce in the region [2].

2 Cross-border E-commerce Development Status and Southeast Asia E-commerce Market Analysis

2.1 Global Cross-border E-commerce Development Status and Problems

The global cross-border e-commerce market is currently experiencing rapid growth and transformation. With the digitalization of global trade and advancements in logistics technology, more and more businesses and consumers are participating in cross-border e-commerce activities. In Fig. 1, we can see the target markets for China's cross-border e-commerce in 2021. Developed countries remain the primary target markets for Chinese export e-commerce, with 54% and 43% of businesses already engaged in operations. Additionally, a quarter of businesses have expanded into the Southeast Asian market [3].

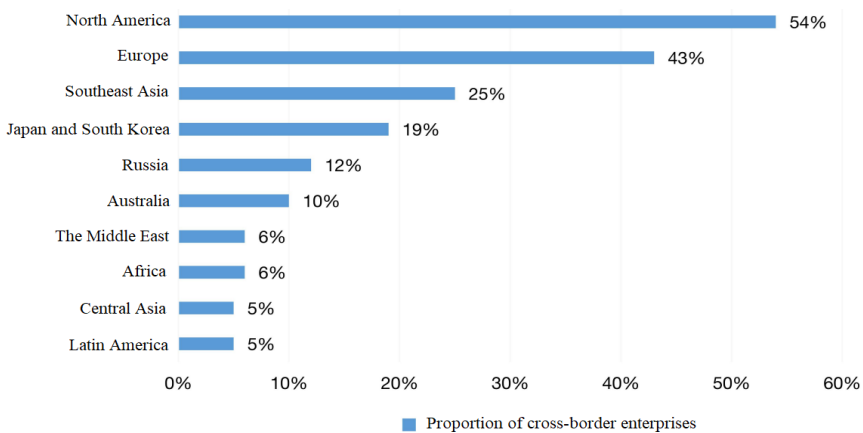


Fig. 1. Chinese cross-border e-commerce companies expanding their markets in 2021

This trend brings great opportunities but also brings some challenges. Firstly, regulatory and policy differences between different countries and regions bring uncertainty and complexity to cross-border e-commerce. There are different regulations regarding customs clearance, tax regulations, intellectual property protection, and other aspects, which pose challenges to businesses' cross-border operations. Secondly, logistics and delivery present another significant challenge for cross-border e-commerce. Distances between different countries, cultural differences, and inadequate logistics infrastructure can lead to issues such as shipping delays and damaged goods, affecting the shopping experience of consumers. Additionally, consumer trust in cross-border e-commerce is a crucial factor. Due to geographical distance and cultural differences between the

transacting parties, consumers may have doubts about the credibility of cross-border e-commerce platforms and sellers. They may be concerned about issues like counterfeit products and risks associated with overseas shopping [4].

2.2 Development Status and Problems of Cross-border E-commerce in China

China's cross-border e-commerce market is in a stage of rapid development and has made remarkable achievements. With the opening of the global market and the rapid growth of China's economy, more and more enterprises and consumers are involved in the field of cross-border e-commerce. In the trade structure of cross-border e-commerce in China, the fluctuation of the proportion of imports and exports has been relatively smooth in general, and although the proportion of imports is continuously increasing, exports are still the main trade structure. As can be seen in Fig. 2, China's cross-border e-commerce will account for 77.6% and 22.4% of imports and exports in 2020, respectively [5].

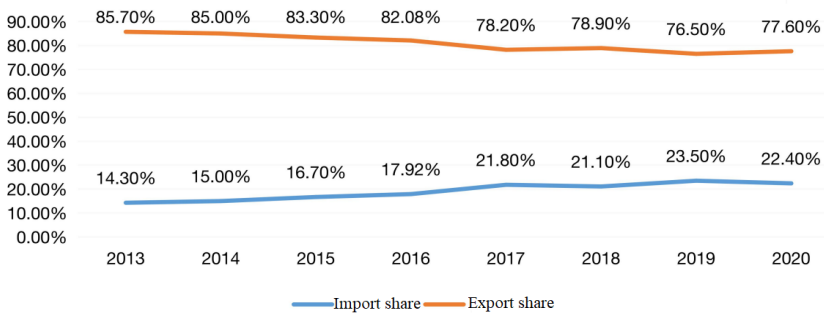


Fig. 2. Structure of China's cross-border e-commerce imports and exports,

However, there are also some issues and challenges in the development process. Firstly, cross-border e-commerce in China faces challenges in terms of regulations and policies. Due to the involvement of various aspects such as cross-border logistics, customs duties, and taxation, there are still imperfections in the regulations and supervision of cross-border e-commerce. Additionally, issues related to electronic payments and consumer rights protection require clearer legal frameworks and regulatory mechanisms. Secondly, the efficiency and quality of logistics and delivery are bottlenecks for cross-border e-commerce in China. Improvements are needed in aspects such as the efficiency of customs clearance, the convenience of clearance procedures, and the reliability of cross-border logistics. Furthermore, controlling logistics costs and reducing delivery time are also urgent problems to be solved [6].

To address these issues, the Chinese government and relevant departments have taken a series of measures. For example, they have strengthened the regulation and supervision of the cross-border e-commerce market, optimized customs clearance processes, and increased the construction of logistics warehousing facilities [7]. Additionally, efforts have been made to enhance intellectual property protection, crack down on counterfeits, and improve consumer rights protection mechanisms [8].

3 Research on E-commerce Platform Based on Blockchain Technology and K-means Cluster Analysis Methodology

Blockchain technology can be used to provide decentralized transaction and settlement mechanisms, enabling fast, secure, and transparent cross-border transactions. Through the immutability and distributed ledger features of blockchain, the authenticity and traceability of transactions can be ensured. Smart contracts are a key tool for automating and programming business logic. With smart contracts, various conditions and rules can be set in transactions, including payment methods, logistics tracking, and refund processes. This provides efficient transaction execution and dispute resolution mechanisms^[9]. Additionally, identity authentication and trust establishment are important components of cross-border e-commerce platforms. Blockchain technology can provide a decentralized identity verification and trust system to ensure the real identities and reputations of participants. This helps to reduce false transactions, fraud, and disputes, and increases user trust in the platform. Moreover, cross-border payments are an urgent problem to be addressed. Blockchain can provide a secure peer-to-peer payment network, allowing for convenient cross-border payments by removing intermediaries and reducing transaction costs. Another solution is to build a cross-border e-commerce trade chain based on public chains. The trade chain is essentially a cross-border e-commerce platform based on blockchain technology, which theoretically can involve various modes such as B2B, B2C, and C2C. All participants, such as buyers, sellers, and third-party service providers, are nodes in the trade chain. Each individual node can use the trade chain to find potential partners, and all nodes collectively maintain the order of the trade chain. Fig. 3 shows the flowchart of recording transaction information through the trade chain.

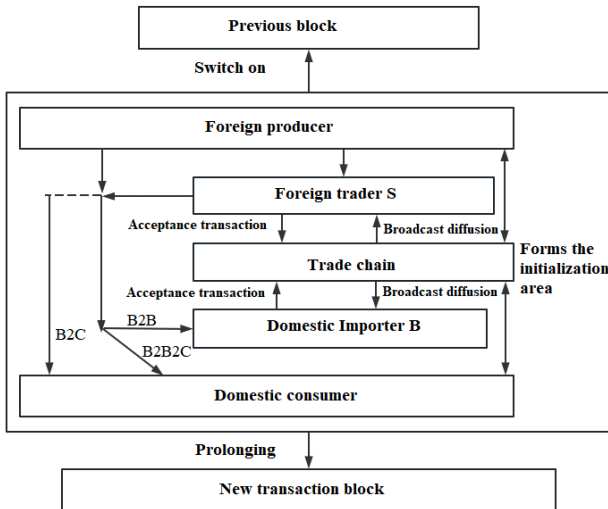


Fig. 3. Flowchart for recording transaction information through the trade chain

4 An Empirical and Strategic Study of the Shopee Platform for E-commerce of Southeast Asian Products

4.1 Data Source

The data for this research covers a wide range of reliable information sources. Firstly, we obtained an international perspective on the e-commerce market size, growth trends, and development by collecting and analyzing relevant industry research reports, market analyses, and academic studies from around the world. Additionally, we conducted in-depth research on the e-commerce market data in China and Southeast Asia, including market size, consumer behavior, and cross-border e-commerce development in various countries and regions. Furthermore, we collected official public data from relevant e-commerce platforms to ensure the accuracy and reliability of the research. As shown in Fig. 4, we used web scraping tools to extract product data from the Shopee Singapore website. The data was collected on January 11, 2022, following the rule of scraping the top 20 pages of each subcategory based on the sales rank. Approximately 1,200 data entries were collected for each subcategory.

	A	B	C	D	E	F	G	H	I	J
1	Name	sold	historical_sold	liked_count	view_count	brand	cmt_count	rating_star	price_min	price_max
2	[Bundle of 2] Redoxon Double Action	5	806	77	286	"Redoxon"	283	4.954063604	4580000	4580000
3	[Bundle of 2] Redoxon Vita Immune C	10	614	106	233	"Redoxon"	232	4.922413793	5180000	5180000
4	Biofinest Spirulina Powder Pure Freeze	22	473	234	322	"Swisse"	185	4.935135135	1990000	1990000
5	Usana Proflavanol c200/cellsentials	24	298	21	192		127	4.992125984	7000000	7000000
6	GNC Vitamin C 1000 Timed-Released	5	401	110	111		189	4.904761905	4588000	4588000
7	[In-Stock] Doctor's Best Extra Strength	4	231	71	90	"Doctor's Best"	126	4.952380952	1790000	4040000
8	Biofinest Broccoli Powder Organic Fr	6	225	78	97		93	4.860215054	1490000	1490000
9	Ning Xia 【Super】 Premium Wolfbert	5	229	68	51	"No Brand"	122	4.918032787	1580000	1580000
10	Blackmores Bio C 1000mg 150 Tabs fo	2	441	74	95	"Blackmores"	152	4.973154362	3290000	3290000
11	Biofinest Korean Panax Ginseng 1000	19	384	134	289		144	4.888888889	2895000	2895000
12	[Bundle of 2] Redoxon Triple Action B	0	360	90	156	"Redoxon"	132	4.946969697	2580000	2580000
13	[1 DAY PROMO] Puritan's Pride Vita	3	243	50	60	**	97	4.917525773	1090000	1090000
14	GrocerKing - Korean Red Ginseng Ch	10	283	58	112	**	118	4.898305085	790000	790000
15	Dried Longan China/Thailand Groc	14	149	23	130	"Yuan Sang"	64	4.984375	1350000	1350000
16	Bioglia Protectis Baby Drops [sm] (S	3	284	42	141	**	79	4.974683544	4000000	9000000
17	NATURE'S WAY HIGH STRENGTH	7	271	88	201	"Nature's Way"	92	4.902173913	2499000	2499000
18	Kirkland Signature Vitamin C (1315m	1	204	60	36	"Kirkland Signa	91	4.923076923	2999000	2999000

Fig. 4. Captured Information

Data source: Shrimp Skin Platform

4.2 Sample Descriptive Statistics

This research employed detailed sample descriptive statistics to fully understand the data involved in the study. Our sample consisted of data from multiple e-commerce platforms in China and Southeast Asia. These platforms covered various product categories and service types. Descriptive statistical analysis was performed on the sample data. Taking the example of the obtained data on women's clothing, Fig. 5 illustrates the analysis of price distribution and trends of the products on the website. The x-axis represents price ranges, and the y-axis represents the number of products in each price range. In the sample, we collected key metrics such as the number of consumers participating in e-commerce transactions, transaction amounts, and purchase frequency.

We also analyzed sales revenue, sales revenue proportion, and growth trends in different product categories, and compared differences among different regions. Furthermore, we focused on cross-border e-commerce data, such as cross-border sales revenue and popular cross-border products.

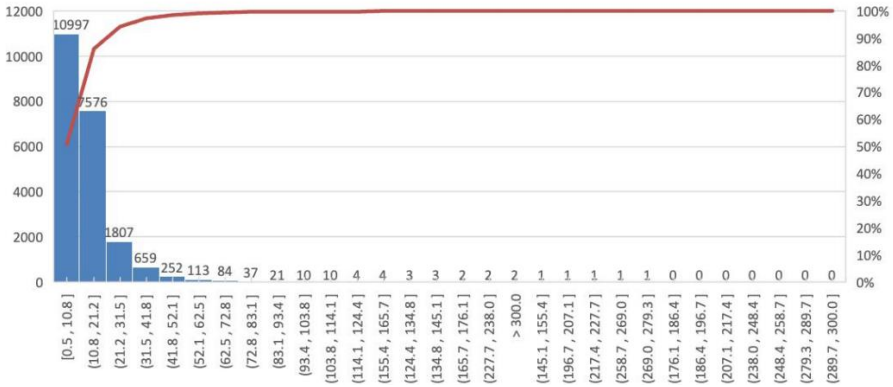


Fig. 5. Commodity price exposure distribution analysis and trend analysis

From Fig. 5, we can observe that there are a larger number of products in the price range of \$0.5 to \$10, but this does not exclude the possibility of low-priced items such as stockings and the likelihood of novice sellers. The price range of \$10 to \$30 has the highest proportion of clothing products, which aligns with the purchasing needs of Southeast Asian users on the platform. By conducting sample descriptive statistics, we can gain a better understanding of the overall situation and trends in the e-commerce market. These statistical results provide us with quantitative data support for further analysis and research on the development potential and issues in the e-commerce industry. Such information is valuable in guiding decision-makers, businesses, and stakeholders in formulating strategies and decisions that advance the sustainable development of the e-commerce sector.

5 Conclusion

Through in-depth research on e-commerce in Southeast Asia, we have gained a clearer understanding of the development issues in this field. E-commerce has enormous market potential in Southeast Asia, but it also faces various challenges, such as expanding market size, driving technological innovation, and transforming business models. This research analyzes the current status of the global, Chinese, and Southeast Asian e-commerce markets, and uses blockchain technology and data mining algorithms, taking Shopee as a case study, to propose a series of feasible solutions and recommendations. In conclusion, through the efforts of this research, we believe that with technological innovation, cooperation, and policy support, the e-commerce industry in Southeast Asia will experience a more prosperous future and make a more positive contribution to regional economic development and improving people's living standards.

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