

MINISTRY OF SCIENCE AND HIGHER EDUCATION
OF THE RUSSIAN FEDERATION

Federal State Budgetary Educational Institution of Higher Education

PENZA STATE UNIVERSITY

Institute of Economics and
Administration
Field of study
Master's degree programme

Department of Sociology, Economic
Theory and International Processes
38.04.01 Economics
International Economics and Business

GRADUATION THESIS

on

Trends in the development of e-commerce in the modern global economy

Master's degree student

Ma
Yuyan

signature, date

Academic adviser

Karimova L. F.

signature, date

Compliance supervisor

Vlazneva S. A.

signature, date

Reviewer

Associate Professor of the Department
of Finance and Business Informatization
of Federal State Budgetary Educational
Institution of Higher Education
Penza State Agricultural University

Fudina E. V.

signature, date

The thesis was approved for defence (record of the department meeting dated _____ no.____)

Head of the Department

Rozhkova L.V.

signature, date

The thesis was defended and marked _____ (record of the State Examination Board dated
_____ no.____)

Secretary of the SEB

Rasskazova N. V.

signature, date

Penza 2026

FSBEI HE Penza State University
Institute of Economics and Administration
Department of Sociology, Economic Theory and International Processes
Field of study 38.04.01 Economics,
Master's degree programme International Economics and Business

APPROVED BY:
Head of the Department
Doctor of Social Sciences,
Professor
Rozhkova L.V.

«_____» _____ 20____

ASSIGNMENT
FOR THE GRADUATION THESIS OF

Master's degree student Ma Yuyan, group 24ЭЭВам1, full-time mode of study

- 1 The topic of the graduation thesis: "Trends in the development of e-commerce in the modern global economy"

was approved by the university order

dated «____» _____ 20__ no. _____

- 2 The deadline for the Master's degree student to complete the graduation thesis is 15.06.2026.

3 The input data for the graduation thesis is the regulatory and legal framework, scientific literature and reference books, and Internet data.

- 4 The list of issues to be studied includes development Background and Current Situation of E-Commerce.

5 The list of visuals contains tables and figures.

6 The date of setting the assignment is 8.10.2024.

Academic adviser _____ / Karimova L. F. /
(signature) (full name)

The assignment was accepted by Master's degree student _____ / Ma Yuyan /
(signature) (full name)

Schedule for completing the graduation thesis

№ п/п	Content of the thesis	Deadline for completion	Due date, signature of the academic adviser
First year of study			
1	Substantiating of the research topic and methodology, subject and object of research	1.09.2024 – 31.10.2024	
2	Framing the scientific concept of research	1.11.2024 – 18.12.2024	
3	Collection of scientific literature for the thesis	19.12.2024 – 15.01.2025	
4	Substantiating the relevance, concept, and novelty of the research	16.01.2025 – 19.02.2025	
5	Framing of a detailed plan and layout of the research	20.02.2025 – 12.03.2025	
6	Studying new literature sources within the topic of the thesis	13.03.2025 – 26.03.2025	
7	Conducting theoretical research within the first chapter of the thesis	27.03.2025 – 30.04.2025	
8	Preparing the first chapter of the thesis	1.05.2025 – 30.06.2025	
Second year of study			
9	Conducting analytical research within the second chapter of the thesis	1.09.2025 – 22.10.2025	
10	Preparing the second chapter of the thesis	23.10.2025 – 24.12.2025	
11	Conducting analytical research within the third chapter of the thesis	25.12.2025 – 25.02.2026	
12	Preparing the third chapter of the thesis	26.02.2026 – 21.04.2026	
13	Preparing the introduction and conclusion	22.04.2026 – 12.05.2026	
14	Completing the graduation thesis	13.05.2026 – 27.05.2026	
15	Handing in the thesis for compliance control and antiplagiat	28.05.2026 – 11.06.2026	
16	Getting acquainted with the feedback and review	13.06.2026	
17	Presenting the written thesis	15.06.2026	

Academic adviser _____ / Karimova L. F. /
(signature) (full name)

The assignment was accepted by Master's degree student _____ / Ma Yuyan /
(signature) (full name)

Summary

The graduation thesis comprises 81 pages, 3 chapters, 9 figures, 25 tables, 88 sources.

E-COMMERCE MODELS, MARKET COMPETITION, E-COMMERCE PLATFORMS

The target of research is to systematically analyze the development status, growth dynamics, and future trends of e-commerce in the modern global economy.

The goal of work is to study drivers and underlying risks influencing the evolution of e-commerce, ultimately providing theoretical and empirical insights for the sustainable development of the e-commerce industry.

The methodological framework of the paper is formed by the complex of theoretical and practical methods such as literature review method, comparative analysis method, case study method, statistical data analysis, economic model analysis, inductive and deductive reasoning.

The results of research include actionable insights for e-commerce enterprises in formulating globalization strategies and technology adoption roadmaps, provides evidence-based references for policymakers in designing regulatory frameworks and infrastructure investment plans.

The recommendations on disseminating and applying the results are as follows a comprehensive and multidimensional analytical framework that integrates technological, economic and management aspects. The study systematically considers all major e-commerce models simultaneously, provides a comparative analysis of differences in regional development based on current data (2020-2025), and offers a comprehensive assessment of both driving factors and risk bottlenecks. In addition, the research includes the latest innovative practices of emerging platforms such as TikTok Shop, Temu and SHEIN, which are rarely systematically analyzed in existing academic literature.

The theoretical relevance of the thesis is established by creating an integrated analytical framework for understanding the development of e-commerce by applying and extending classical economic theories to the digital context.

The target of research can be further explored through a comparative analysis of foreign experience in applying e-commerce models in modern conditions.

Content

Introduction	3
Chapter 1 Background and Theoretical Foundations of E-Commerce	6
1.1 Development Background and Current Situation of E-Commerce.....	6
1.2 Main Models of E-Commerce	8
1.3 E-commerce Technology	28
Chapter 2 E-commerce Status	33
2.1 Global E-commerce Market Size and Growth Trends.....	33
2.2 The Success Stories of Global E-commerce Giants: Amazon and Alibaba.....	42
2.3 Innovative Practices of Other Emerging E-commerce Platforms.....	54
Chapter 3 Driving factors and risks of e-commerce development.....	62
3.1 Globalization and Market Competition.....	62
3.2 Changes in Consumer Demand.....	66
3.3 Bottlenecks in Logistics and Payment Systems.....	68
Conclusion.....	73
References	76

Introduction

In the context of the digital economy, e-commerce has emerged as a transformative force reshaping global trade patterns, consumer behavior, and economic structures. As of 2023, global e-commerce retail sales reached approximately \$6.3 trillion, accounting for over 20 % of total global retail sales, with projections exceeding \$8 trillion by 2025. The rapid development of e-commerce has not only revolutionized traditional business models but has also become a critical engine for global economic growth, employment generation, and international trade facilitation. Understanding the development trajectory, driving factors, and inherent risks of e-commerce in the modern global economy is therefore of paramount importance for policymakers, businesses, and academic researchers alike.

The object of this research is the global e-commerce industry as a holistic socioeconomic phenomenon, encompassing its evolutionary process, operational mechanisms, and multifaceted impact on the international economic landscape.

The subject of the research comprises the key components of the e-commerce ecosystem, including its principal business models (B2B, B2C, C2C, cross-border, O2O, social commerce, DTC, B2G), underlying technologies (AI, blockchain, IoT, XR), market structure and growth patterns, successful practices of leading platforms (Amazon, Alibaba) and emerging players (Shopee, Mercado Libre, TikTok Shop), as well as the driving factors and bottlenecks constraining its sustainable development.

The goal of this research is to systematically analyze the development status, growth dynamics, and future trends of e-commerce in the modern global economy, while identifying the key driving forces and major risks affecting its evolution, ultimately providing theoretical and empirical insights for the sustainable development of the e-commerce industry.

To achieve the stated goal, the research sets forth the following objectives:

1. To trace the developmental background, current situation, and evolutionary trajectory of e-commerce, examining its industrial chain structure and historical milestones.
2. To systematically classify and comparatively analyze the eight main models of

e-commerce, elucidating their distinctive characteristics, representative platforms, and regional variations.

3. To explore the core technologies driving e-commerce innovation, including AI, blockchain, Iot, and extended reality, assessing their application effectiveness and maturity.

4. To measure the global e-commerce market size and growth trends, analyzing regional disparities and economic impacts based on classical economic theories (transaction cost theory, long tail theory, economies of scale and scope).

5. To examine the success stories of global e-commerce giants (Amazon and Alibaba) and innovative practices of emerging platforms, deriving strategic insights.

6. To identify the driving factors (globalization, changes in consumer demand) and major bottlenecks (logistics and payment system constraints) affecting e-commerce development.

The novelty of this research lies in its comprehensive and multidimensional analytical framework that integrates technological, economic, and managerial perspectives. Unlike previous studies that focus on single aspects of e-commerce, this research systematically examines all major e-commerce models simultaneously, provides a comparative analysis of regional development disparities based on up-to-date data (2020-2025), applies classical economic theories (transaction cost theory, long tail theory) to quantify e-commerce's impact on the global economy, and offers an integrated assessment of both driving factors and risk bottlenecks. Furthermore, the research incorporates the latest innovative practices of emerging platforms such as TikTok Shop, Temu, and SHEIN, which have rarely been systematically analyzed in existing academic literature.

The significance of this research is twofold. Theoretically, it contributes to the digital economy literature by constructing an integrated analytical framework for understanding e-commerce development, applying and extending classical economic theories to the digital context, and providing empirical data and case studies for future comparative research. Practically, the research offers actionable insights for e-commerce enterprises in formulating globalization strategies and technology adoption roadmaps,

provides evidence-based references for policymakers in designing regulatory frameworks and infrastructure investment plans.

This research adopts a mixed-method approach combining qualitative and quantitative analyses. The specific research methods include:

1. Literature Review Method: Systematically reviewing academic literature, industry reports, and official statistics to establish the theoretical foundation and contextual background of e-commerce development.

2. Comparative Analysis Method: Comparing different e-commerce models (B2B, B2C, C2C, O2O, social commerce, DTC, B2G) and regional market characteristics (North America, Europe, China, Southeast Asia, Latin America, Africa) to identify similarities, differences, and best practices.

3. Case Study Method: Conducting in-depth case analyses of representative e-commerce platforms, including Amazon, Alibaba, Shopee, Mercado Libre, and TikTok Shop, to extract successful strategies and innovative practices.

4. Statistical Data Analysis: Utilizing secondary data from authoritative sources such as Statista, eMarketer, and company annual reports to quantify market size, growth rates, penetration rates, and transaction values.

5. Economic Model Analysis: Applying transaction cost theory, long tail theory, and economies of scale/scope theories to interpret and measure e-commerce's impact on global economic efficiency and market structure.

6. Inductive and Deductive Reasoning: Synthesizing findings from empirical data and case studies to derive general conclusions about development trends, driving factors, and risk bottlenecks.

Chapter 1 Background and Theoretical Foundations of E-Commerce

1.1 Development Background and Current Situation of E-Commerce

E-commerce industry is an emerging field of commercial activities relying on Internet technology, covering multiple aspects such as commodity trading, service provision and information exchange. Through electronic means, the industry realizes the convenience and efficiency of the transaction process, which greatly changes the traditional business model. The e-commerce industry chain includes upstream commodity supply and manufacturing, midstream e-commerce platform operation and transaction services, and downstream logistics and distribution and consumer links [74, 23]. The upstream link is responsible for providing rich and diverse commodities, the midstream link connects the supply and demand sides through the e-commerce platform, facilitates transactions and provides value-added services such as payment and customer service, while the downstream link ensures that the commodities are quickly and accurately delivered to consumers. The entire industry chain is closely linked and together they are driving the vigorous development of the e-commerce industry.

The origin of e-commerce can be traced back to the 1960s, when companies began to use Electronic Data Interchange (EDI) technology to transmit orders, invoices and other business documents over a dedicated network, replacing paper-based processes, which is considered the prototype of e-commerce [78]. By 1991, the Internet was opened to the public and the World Wide Web was born, laying the foundation for the development of e-commerce, which ushered in rapid development [9]. By utilizing e-commerce, enterprises can construct a commercial marketing system covering the whole world, implement a global business strategy, strengthen inter-industry cooperation on a global scale, and thus enhance their global competitiveness. Especially for small businesses or industries, e-commerce can help them to understand the worldwide market demand. It facilitates cooperation with companies around the world. Make the e-commerce market after the traditional market and a huge market. 1995, Amazon and eBay in the United States was established, marking the Internet as a platform for the transaction of goods and

services for the formal rise of the emerging economic model [3]. 1998, PayPal and Google's establishment and birth, the development of online payments and the popularity of search engines for the development of e-commerce attract traffic [63, 36, e-commerce rapidly spread around the world, the popularity of e-commerce. E-commerce quickly spread around the world, becoming a simple, fast, low-cost way of trading. 2000 the internet bubble burst, a large number of e-commerce companies closed down bankruptcy, but amazon, eBay and other industry giants through the optimization of its own business model in the era of survival and development and growth [62]. 2011, Instagram, WeChat and other social platforms began to be with the In 2011, social platforms such as Instagram and WeChat began to combine with e-commerce, giving birth to “social e-commerce”, and Groupon led the group-buying model trend, promoting the local life service e-commerce [43, 40. With the continuous development of economic globalization in recent years, the optimization of big data and AI technology, the global division of labor and the improvement of the logistics system, such as DHL, FedEx, etc., which enable the rapid cross-border circulation of goods. And the online channel reduces intermediate costs, and some SMEs are able to face global consumers through the platform. And with the fast-paced life of people, more and more consumers are pursuing a convenient online shopping experience. At the same time, regional economic cooperation has greatly reduced tariff barriers for cross-border e-commerce, all of which are driving the permeable development of e-commerce (figure 1.1).

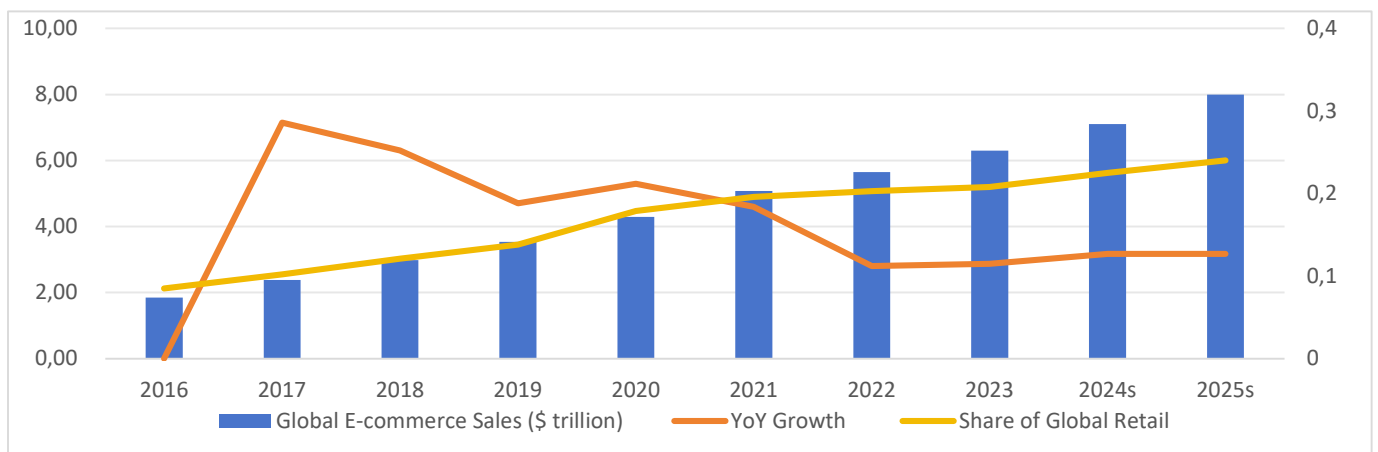


Figure 1.1 – Global E-commerce Retail Sales Growth Trend (2016-2025) [23]

As of 2023, global e-commerce retail sales are expected to reach \$6.3 trillion, accounting for more than 20 % of total global retail sales. China, the world's largest e-commerce market, accounts for nearly 40% of global transactions, while regions such as Southeast Asia, Latin America, and Africa are experiencing the fastest growth rates, with an average annual growth rate of more than 15% (table 1.1).

Table 1.1 – Regional Distribution of Global E-commerce Market (2023) [74]

Rank	Region/Country	Share of Global E-commerce	Key Characteristics
1	China	39.80 %	Largest market, social commerce
2	United States	18.60 %	Mature market, Amazon dominance
3	Europe	15.20 %	Sustainability focus, strict compliance
4	Southeast Asia	6.80 %	Fastest growth, social commerce
5	Latin America	4.50 %	Localized platforms
6	Japan/South Korea	5.10 %	Mature, mobile payments
7	Others	10.00 %	Africa, Middle East emerging

Europe and the United States focus on sustainable e-commerce, with Amazon, eBay, and Shopify still dominating their e-commerce industries.

1.2 Main Models of E-Commerce

B2B (business-to-business) e-commerce accounts for more than 70 % of global e-commerce turnover [74, is the dominant mode in the field of e-commerce, the core driver from the large volume of business-to-business transactions, supply chain synergy needs and the acceleration of the digital transformation, and there are obvious differences in the regional distribution: Europe and the United States are mature markets to comprehensive and vertical industry platforms, covering the global supply chain network, Southeast Asia, Latin America and other emerging markets due to the rise of policy dividends and consumption potential, the Southeast Asian market accounted for more than 15 % of China's cross-border B2B exports in 2023. In terms of categories, traditional tools and

equipment, textiles still dominate, but new energy components, industrial robots and other technology-intensive products are growing at a significant rate, and the proportion of such categories in China's cross-border e-commerce B2B exports will increase to more than 20 % in 2023, while the global supply chain is digitized end to end through B2B platforms, such as blockchain technology applied to cross-border raw material procurement, and smart contracts to automatically enforce the terms of the transaction. Typical cases such as Alibaba International Station connects more than 47 million SMEs around the world, covering 200+ countries, with transaction volume exceeding RMB 6.9 trillion in 2023, integrating AI algorithms and blockchain technology to guarantee transactions [1] SAP Ariba serves multinational enterprises in supply chain management, with a platform volume of more than USD 3.5 trillion in 2023, and optimizes inventory turnover of more than 15 % through AI, and also cooperates with Maersk to launch a blockchain platform to shorten cross-border contract processing time. In terms of technology-driven trends, blockchain is deeply integrated in cross-border payment, contract management and other fields, such as Maersk TradeLens platform processing more than 10 million cross-border transactions in 2023, reducing the rate of logistic disputes by 20 %, and the transaction volume of the PBC chain in the energy sector exceeds \$500 million; AI-driven intelligent supply chain realizes intelligent procurement, dynamic pricing and demand forecasting, and the introduction of AI in a manufacturing platform AI-driven intelligent supply chain enables intelligent procurement and dynamic pricing and demand forecasting, and a manufacturing platform introduced AI to reduce procurement cost by 15 %, and a digital business cloud system reduces inventory cost by 20 % [68] meanwhile, decentralization and ecological synergies promote supply chain financial innovation and green supply chain development, for example, “Dada Buying Steel” improves accounts receivable financing efficiency by 40 % through the blockchain and reduces the cost by 30 %, and the European Union requires the disclosure of carbon emission data. In 2025, 80 % of energy transactions will be completed through blockchain. However, B2B e-commerce companies are facing challenges such as blockchain performance and scalability bottlenecks, differences in data privacy regulations among countries, and insufficient penetration of SMEs due to the high threshold of AI and blockchain technologies, so they need to

optimize their technologies, push for the unification of international standards, and provide low-code tools to reduce the cost of access (table 1.2) [54].

Table 1.2 – B2B E-commerce Regional Market Comparison [1]

Region	Market Share	Major Platforms	Technology	Growth Drivers
NorthAmerica	35 %	"Amazon Business, SAP Ariba"	"AI, Blockchain"	Digital procurement
Europe	30 %	"Alibaba, SAP Ariba"	Smart contracts	Green supply chain
China	20 %	"1688.com, Alibaba"	"Blockchain, AI"	Industrial digitization
SoutheastAsia	8 %	"Alibaba, Shopee"	Cross-border payment	Policy dividends
Others	7 %	Regional platforms	Basic thchnology	Rapid growth

Overall, B2B e-commerce is evolving from a “trading platform” to an “all-chain digital service ecosystem”, and technology-driven efficiency improvement and emerging market expansion are the core growth points in the future, and enterprises need to build a more resilient global supply chain network through technology integration, ecological synergy and policy adaptation. Enterprises need to build a more resilient global supply chain network through technology integration, ecological synergy and policy adaptation.

B2C (business-to-consumer) e-commerce shows distinctive regional characteristics and strong growth momentum in global development. From the perspective of regional differences, developed markets have formed a comprehensive platform dominated by Amazon and Jindong, relying on mature warehousing and logistics systems, perfect after-sales protection mechanisms and a large user base, occupying a major share of the market; while in Southeast Asia, Latin America and other emerging markets, social e-commerce and localized platforms have become the mainstream, such as Shoppe, through the incorporation of social fission play (e.g., “chop a slice”). “cut a knife” ‘team group’) to activate the sinking market, Mercado Liber by virtue of the depth of understanding of the local consumption habits of Latin America (such as support for localized payment methods, Spanish full-process services) to build a regional competitive

barrier. Cross-border B2C field is ushering in explosive growth, according to marketer's forecast, global cross-border retail sales will exceed 2.3 trillion U.S. dollars in 2025 [23] in which the globalization layout of Chinese brands is particularly eye-catching - Amazon provides third-party sellers with an integrated solution of warehousing, sorting, and distribution through FBA (Amazon Logistics) services, significantly reducing the threshold of cross-border operations for small and medium-sized enterprises (SMEs). Amazon provides third-party sellers with integrated warehousing, sorting and distribution solutions through FBA (Amazon Logistics) services, significantly reducing the threshold of cross-border operations for small and medium-sized enterprises, and its global logistics coverage has exceeded 200 countries and regions in 2023 [3] fast-fashion brand SHEIN subverts the traditional logic of retailing with the DTC (direct-to-consumer) model, accurately reaching European and American Gen Z consumers through a self-supporting flexible supply chain (7 days of high-speed printing, fast-reaction production of small orders) and the traffic operation of social platforms such as TikTok. Consumers, the GMV of the apparel category in the European and American markets will grow over 70 % year-on-year in 2023 [71]. In terms of future trends, the "hyper-localization" strategy has become the key to break the game, and enterprises need to fully adapt to regional cultures from product design to marketing chain, for example, launching improved robes in the Middle East market in line with Islamic culture, and launching limited packaging in the Japanese market in conjunction with the cherry blossom season; and "green e-commerce" is moving from concept to mandatory. "Green e-commerce is moving from concept to mandatory norms, the EU has legislated to require e-commerce platforms to disclose the carbon footprint of the entire life cycle of products, and some headline companies such as Zalando have labeled the "carbon emission factor" on the product detail page, guiding consumers to choose low-carbon commodities and promoting the use of recycled fabrics in the supply chain, At the same time, they promote the adoption of recycled fabrics and optimized logistics and packaging in the supply chain, accelerating the industry's transition to sustainable development (table 1.3).

C2C (consumer-to-consumer) e-commerce is undergoing an iterative upgrading from traditional second-hand transactions to full-dimensional value exchanges globally,

and its development is characterized by significant market stratification and model innovation. In terms of scale, the global second-hand e-commerce market is accelerating under the concept of sustainable consumption, and GlobalData data shows that the market size will exceed

Table 1.3 – B2C E-commerce Regional Characteristics Comparison [57]

Dimension	Europe/US	China	Southeast Asia	Latin America
Leading Platforms	Amazon, eBay	Taobao, Tmall, JD.com	Shopee, Lazada	Mercado Libre
Key Features	Logistics, Membership	Live commerce, Full category	Social fission, Mobile-first	Local payments, Installments
User Preferences	Quality, Speed	Price, Interaction	Social, Discounts	Trust, Localization
Growth Rate	6-8 %	8-10 %	18-20 %	15-18 %

\$400 billion in 2030 [34], of which more than 60% of the transaction value will be contributed by the mature markets in North America and Europe, and that the standardized trading system built on platforms such as eBay (e.g., the global shipping network and the certified quality inspection service) will promote cross-border circulation of high-priced items such as luxury goods and collectibles. High-value categories such as cross-border circulation - eBay through the “Authenticated by eBay” certification services, 2023, driving the second-hand watches, jewelry turnover increased by 55 % year-on-year, the customer unit price of more than 2,000 U.S. dollars [22] while the emerging markets of Southeast Asia, Latin America and other emerging markets. Southeast Asia, Latin America and other emerging markets present a unique path of “social e-commerce + light assets”, Facebook Marketplace with 2.8 billion monthly users of the flow advantage [59], in Brazil, Indonesia and other countries to form a “social chat + commodity trading The closed-loop ecology of “social chat + commodity trading” is formed in Brazil, Indonesia and other countries, and the proportion of second-hand furniture and maternal and child

products in C2C transactions on the platform will reach 42 % in 2023, while Carousell reduces the threshold of transactions through the concept of “mobile stall”, and users can synchronize commodities to social platforms such as Instagram and TikTok with one click. In 2023, the Philippine market will see an 80% year-on-year surge in used cell phone transactions (table 1.4).

Table 1.4 – C2C E-commerce Major Platforms and Models [11]

Platform	Main Categories	Core Innovation	2023 GMV	Key Features
eBay	Luxury, Collectibles	Authentication service	\$500B+	Authenticity Guarantee
Mercari	Apparel, General	Carbon credit system	\$100B+	Mercari Green
ThredUp	Second-hand apparel	AI sorting	\$30B+	Rapid pricing
Xianyu (Idle Fish)	All categories	Community trading	\$700B+	Credit system
Carousell	Phones, Furniture	Social sync	\$10B+	One-click multi-platform

At the level of model innovation, the circular economy is being transformed from a concept into a concrete business practice: Mercari Japan has launched the “Mercari Green” program, in which users can earn carbon points by selling unused clothes, which can be exchanged for environmentally friendly branded commodities or offset shipping costs, and the program will drive the platform to reduce carbon emissions by 120,000 tons in the second-hand clothing trade in 2023 [58] while at the same time, the program has been working with the U.S. government to reduce carbon emissions. with a premium rate of 30 % for renovated single products; the U.S. ThredUp improves the efficiency of second-hand clothing processing through the AI intelligent sorting system, and shortens the time for each piece of clothing to be inspected and priced from 48 hours to 15 minutes. In 2023, the platform's GMV exceeded \$3 billion, making it a unicorn in the C2C second-hand fashion field. In the field of virtual commodity trading, OpenSea and other platforms rely on blockchain technology to build a digital asset confirmation system, and the C2C transaction volume of virtual commodities such as NFT artwork and game skins will reach \$78 billion in 2023 [17] of which Axie Infinity game props trading, players realize the cross-platform circulation of virtual pets and equipment’s through the C2C

mode, and the peak transaction volume in a single month exceeds \$120 million. 120 million U.S. dollars [7] South Korea's K-pop fan economy to promote the virtual peripheral C2C trading outbreak, Weverse platform fans homemade NFT avatar, concert digital ticket trading scale of 2023 growth of 210 %, giving birth to the “virtual solidarity economy” new ecology [66].

Driven by technology, C2C e-commerce is breaking through the boundaries of traditional transactions: the application of AI visual recognition technology on platforms such as Carousell and Idle Fish automatically matches categories and generates descriptions when products are photographed and uploaded, and the efficiency of users' posting has been increased by 60 %; and the popularization of blockchain smart contracts in second-hand luxury goods transactions, such as the “Blockchain Traceability Certificate” launched by Poshmark, has realized the “Blockchain Traceability Certificate” of second-hand luxury goods. The popularization of blockchain smart contracts in second-hand luxury goods transactions, such as Poshmark's “Blockchain Traceability Certificate”, which realizes the production batches and circulation records of LV, Gucci and other brands' bags to be uploaded to the chain for verification, and the dispute rate of the relevant categories will drop by 45 % by 2023; and the exploration of localized technology adaptation in emerging markets, such as the launch of Quikr in India's “Voice Search + Dialectal Customer Service”, which covers 12 local languages. Covering 12 local languages, the proportion of users in rural areas will increase to 38 % in 2023. At the policy level, the regulation and support of C2C e-commerce in various countries go hand in hand, the European Union provides VAT exemption through the Second-hand Commodity Strategy, and France requires C2C platforms to disclose the environmental qualifications of the sellers; Thailand and Vietnam are piloting the “second-hand trading tax-free zone” to promote the C2C model as an important hand of the circular economy, and the C2C market size is expected to exceed 30 billion US dollars in Southeast Asia in 2025. It is expected that in 2025, Southeast Asia's C2C market will exceed USD 30 billion, with a compound annual growth rate of 22 %, while virtual goods trading is becoming the next breaking point in the C2C field under the background of gradual clarification of regulation (e.g., the U.S. CFTC defines part of the NFT as commodities) [17].

Cross-border E-commerce has shown a pattern of regional hotspot outbreaks and structural challenges globally, and is becoming a core link connecting the global consumer market. In terms of regional growth, Southeast Asia is leading the way with an average annual growth rate of more than 20 %, Lazada has built a warehousing and logistics network covering Singapore, Malaysia and Thailand relying on Ali's ecosystem, and the proportion of 3C products in cross-border orders on the platform will reach 35% in 2023 [53], while Shopee has increased cross-border apparel transactions by 60% year-on-year through the dual mode of “local store + cross-border store” in the Indonesian market. Apparel turnover increased by 60 % year-on-year [69] the Middle East market competition is white-hot, Noon with localized operations (support for Arabic customer service, Ramadan customized marketing) to occupy the high-end market, Amazon.ae through the Prime membership system to quickly penetrate the Middle East cross-border e-commerce turnover exceeded 24 billion U.S. dollars in 2023 [3] with a compound annual growth rate of 18 %; the Latin American market presents Mercado Libre dominated the pattern, which occupies more than 50% of the market share, in Brazil, Mexico and other countries through the self-built customs clearance team to solve the logistics pain points, the platform cross-border electronic product turnover in 2023 increased by 75 % year-on-year [57]. However, the industry is also facing tariff policy fluctuations (such as the EU VAT reform in 2021 to eliminate the tax-free policy for goods under 22 euros, resulting in a 12 % increase in the cost of China's cross-border parcels) and localized logistics bottlenecks (Brazil's customs clearance process is cumbersome, the rate of cargo detention rate of more than 20 %, Caijiao network for this reason, the construction of intelligent clearance center in Sao Paulo, the time to compression of customs clearance from 7 days to 48 hours) [10].

Typical cases such as AliExpress, as China's cross-border e-commerce benchmark, through the “China Direct + Overseas Warehouse” dual-track model, cell phone accessories, household goods to 220 countries around the world in 2023, in the Russian market accounted for 38 % of cross-border orders [25], and the launch of the “Worry-free Logistics”. “Worry-free logistics” to protect after-sales; Temu, as a platform under Jinduoduo, impacts the European and American markets with the strategy of ‘extreme low

price + social fission', and in 2023, it attracted traffic in the North American market through the TikTok Challenge, with more than 20 million new users in a single month. The price of apparel products is 40-60 % lower than that of local e-commerce companies, forcing brands such as Shein to adjust their pricing strategies. In terms of development trend, "bonded warehouse + overseas warehouse" mode has become the core of efficiency, Cainiao network in the global layout of 150 + overseas warehouse, covering the major ports in Europe and the United States, cross-border parcel delivery time limit from an average of 20 days to shorten to 5-7 days [10] a 3C sellers through the German bonded warehouse stocking, the cost of order fulfillment reduced by 30 %; DTC brand Overseas into the golden period, China's Anker innovation (Anker) through the "Amazon boutique + independent station DTC" combo, the share of charging equipment in the North American market reached 25 %, and its independent station re-purchase rate of more than 35 % [4] which is higher than the industry average of 15 percentage points, and at the same time, through the localization of content marketing (such as cooperation with overseas technology bloggers) to build brand awareness, and to build brand awareness through localized content marketing (e.g., evaluation). At the same time, through localized content marketing (such as cooperation with overseas technology bloggers to evaluate) to establish brand awareness, promote cross-border e-commerce from "selling goods" to "branding" transformation. In addition, the application of emerging technologies accelerates the iteration of the industry, AI product selection tools (such as Jungle Scout) to help sellers analyze the demand of overseas markets, a home seller through the data prediction of the launch of electric blankets in Europe, the winter of 2023 sales exceeded 5 million U.S. dollars; blockchain technology used in cross-border payment, Ant Group's Alipay + has supported 100 + currencies real-time settlement, reducing the cost of exchange losses by 30 %, and reducing the cost of exchange losses. Reduce 30 % of the exchange loss cost, while the Middle East, Southeast Asia and other emerging markets in the policy dividend (such as Indonesia on cross-border e-commerce imports to implement a low tax rate) and consumption upgrading driven by the global cross-border e-commerce transactions are expected to exceed 3.5 trillion U.S. dollars in 2025, the compound annual growth rate to maintain a compound annual growth rate of more than 15 % (table 1.5).

Table 1.5 – Major Cross-border E-commerce Platforms Comparison (2023) [69]

Platform	Parent Company	Major Markets	Core Model	2023 GMV	Competitive Advantage
AliExpress	Alibaba	Russia, Europe, Brazil	China Direct + Overseas Warehouse	\$30B+	Supply chain integration
Temu	Pinduoduo	Europe, US	Ultra-low price + Social fission	\$15B+	Price advantage
Amazon	Amazon	Global	FBA logistics	\$600B+	Logistics network
Shopee	Sea Group	Southeast Asia	Localized operations	\$100B+	Social commerce

O2O (online-to-offline) e-commerce is taking technological innovation as its engine, accelerating its evolution to “all-link digitalization, instantaneousness, and ecology” globally, and its development shows the dual characteristics of regional deep-rootedness and model breakthroughs. From the perspective of regional development, the Asian market continues to lead the process of local life service e-commerce, China's Meituan in consolidating the advantages of the takeaway market at the same time, the O2O scene will be extended to the cultural and tourism consumption - 2023 “May Day” holiday through the on May 1, 2023, through the “online ticketing + scenic area digital guide” service, it drove the passenger flow of cooperative scenic spots to increase by 40 % [56] and launched the “Meituan Preferred” community group purchase model, relying on offline self-pickup points to realize “next day delivery” of fresh goods. ”, covering more than 2,000 counties and towns in the sinking market; Indonesia Gojek through the “multi-service aggregation + localized payment” to build competitive barriers, its platform to support the rupiah cash recharge, bank transfers and other 12 types of payment methods, launched in Jakarta in 2023, The “Gojek Mart” instant retail service launched in Jakarta in 2023 realizes the 15-minute delivery of convenience store goods by virtue of the flexible distribution network of motorcycle riders, and the order volume exceeds 5 million units in a single month [35]. Europe and the United States market is more focused on the O2O model and the depth of the integration of offline retail, Nike stores in Europe to deploy “intelligent fitting mirror”, through the camera to identify the user's body shape and recommended size, synchronized push online exclusive discount code, 2023, the service to

make stores try on the conversion rate increased by 30 %, the online repurchase rate increased by 22 % [60] UK Ocado applies the O2O model to fresh food retail, through the online mall and offline intelligent warehouse linkage, the use of robotic sorting system to realize the order within 2 hours of delivery, in 2023 in the London area of fresh food O2O market share of 28 % [61].

At the level of technology-driven model innovation, “instant retail” track ushered in explosive growth, Gorillas in Europe more than 30 cities in the deployment of miniature warehouse, the use of AI algorithms to predict the regional consumer demand and dynamic replenishment, a German Berlin warehouse through data analysis in the World Cup in advance of the reserves of beer, snacks, single warehouse daily order volume exceeded 3,000 units. The daily order volume of a single warehouse exceeded 3,000 orders, an increase of 250 % over the weekdays [38] China's flash delivery through the “crowdsourcing capacity + intelligent scheduling” to solve the pain points of instant delivery, in 2023, the platform daily average of more than 3 million orders of local emergency delivery tasks, including documents, flowers and other non-standardized items distribution accounted for 62 % [29]. The application of AR/VR technology has reshaped the O2O consumer experience. Sephora App's “Virtual Makeup Trial” function supports users to upload facial photos to try hundreds of makeup products, and the data shows that the purchase decision time of users using this function has been shortened by 40 %, and the price of the customer unit has been increased by 18 % [70] Ikea has further upgraded its AR technology by launching the “Whole House Design Tool”. Ikea further upgraded its AR technology and launched the “whole-house design tool”, which allows users to upload house plans online and virtually place furniture, and the generated 3D plans can be directly ordered and purchased, which will drive the growth of online furniture customization orders by 150 % in 2023 [42]. In addition, the cross-border integration of O2O and local services has given rise to a new industry, Japan's “Recruit Pay” will be online reservation services and payment and settlement through the user in the beauty salon consumption can be completed directly through the App payment and accumulation of points, 2023, the model of the cooperative merchants of the re-purchase rate increased by 25 %; South East Asia Grab launched the “GrabHealth” medical O2O service, users can make online

appointments for consultation, purchase medicines and enjoy the delivery of medicines to the door by riders, and in 2023, the service will cover more than 500 hospitals and clinics in Malaysia and Thailand, and the number of monthly active users will exceed 3 million [39].

Driven by both policy and technology, O2O e-commerce is facing new development opportunities and challenges globally: on the one hand, countries are accelerating the implementation of supportive policies for the digitization of local life services, such as the South Korean government's launch of the “O2O Innovation Fund” to support SMEs' access to online service platforms; and in India, through the “Digital India” campaign, the “Digital India” campaign has been launched. India has simplified the digital transformation process of offline merchants through the “Digital India” program, and the local life O2O market in India will grow 35 % year-on-year in 2023. On the other hand, the environmental pressure of instant delivery and data privacy issues have gradually come to the fore, the European Union requires O2O platforms to achieve 50 % electrification of delivery vehicles by 2025, and a European takeaway platform has invested 200 million euros in updating its fleet of electric motorcycles for this purpose; and the Consumer Privacy Act (CCPA) of California, the United States requires O2O platforms to explicitly notify the scope of use of users' location data, forcing enterprises to optimize their data management systems. Data management system. Looking ahead, with the improvement of AI computing power and the popularization of edge computing technology, the O2O model will evolve to “predictive service” - by analyzing users' historical behavior, geographic location and real-time scenarios, it will proactively push personalized services (e.g., automatically recommending nearby coffee shop offers during the commute), and it is expected that in 2020, O2O platforms will be able to provide personalized services. It is expected that the global O2O e-commerce market will exceed USD 1.8 trillion in 2025, of which instant retail and local life service digitization will contribute more than 70 % of the growth rate, while emerging markets (e.g., the Middle East and Africa) are expected to become the next growth pole of the O2O model under the impetus of the increase in the penetration rate of smartphones and the improvement of the payment infrastructure (table 1.6).

Table 1.6 – O2O E-commerce Typical Platforms and Models [56]

Platform	Core Business	Technology Innovation	Coverage	2023 Key Data
Meituan	Food delivery, in-store	Smart dispatch, drone delivery	2000+ counties	60M peak daily orders
Gojek	Instant delivery, mobility	Multi-service aggregation	Indonesia, Singapore	10M+ daily orders
Ocado	Fresh grocery retail	Robotic sorting	United Kingdom	28% market share
Gorillas	Instant retail	AI inventory forecasting	50+ European cities	3000+ daily orders/warehouse

Social e-commerce and live e-commerce have shown the development trend of “distinctive regional characteristics and technology-driven fission” globally, and are reshaping the global consumption chain with a growth potential far exceeding that of traditional e-commerce. In terms of regional pattern, the Chinese market is in the leading position by virtue of its mature ecosystem, and Jitterbug's e-commerce, through the mode of “content seeding + instant conversion”, will exceed 3.5 trillion yuan in GMV in 2023 [21, and its logic of “interest e-commerce” will drive the average viewing volume of live broadcasts of beauty and clothing categories to over 1 billion yuan. Its “interest e-commerce” logic drives the average number of viewers of live broadcasts in beauty, clothing and other categories to exceed ten million; fast hand is relying on the user base of the sinking market, forming a special feature in the field of live broadcasts of agricultural products, and in 2023, live broadcasts to help farmers will drive more than 8 million farmers to increase their income [51. Europe and the United States market presents “social platform dominated” characteristics, Instagram Shopping integration of brand stores and live features, in 2023 in North America, the fashion category live conversion rate is 4 times higher than the traditional e-commerce [43] TikTok Shop is “cross-border live + cultural adaptation” breakthrough. TikTok Shop breaks through with “cross-border live broadcast + cultural adaptation”, and in 2023, it will launch the combination of “local netizens + Chinese supply chain” in the UK market, and the sales of a 3C brand's single live broadcast will exceed \$2 million [77] and in the Indonesian market, through the use of dialect anchors and localized selection, the average order volume of apparel live

broadcasts will reach 50,000 orders. Southeast Asian markets rely on the social ecology of rapid penetration, Facebook Live in Malaysia, Thailand, beauty care live, the average user viewing time of more than 25 minutes, the conversion rate than the graphic details page to improve 3.8 times [59] Lazada will live with the combination of holiday marketing, 2023 “double 11” period Lazada combines live streaming with holiday marketing, and during the “Double 11” period in 2023, the GMV of live streaming in many Southeast Asian countries increased by 200 % year on year [53].

Typical cases such as TikTok Shop accelerated globalization through “cross-border live broadcasting + traffic support”, launched the “Black Friday Super Live Week” in the German market in 2023, and joined hands with Chinese home furnishing brands to create the “German Lifestyle” special show. Lifestyle” special field, a single scene to attract more than 3 million viewers, driving the search volume of related products increased by 800 %; Pinduoduo's Temu will be ‘social grouping + live interaction’ mode replicated to Latin America, launched in the Mexican market,” live cut a knife! “play, users can get discounts by sharing the live broadcast and inviting friends to help, in 2023, the activity led to an average weekly growth of 1.5 million new user registrations. In terms of technology-driven trends, AI virtual anchor has become the core solution to reduce operating costs, South Korea Zepeto platform for brand customized virtual idol anchor, support 24-hour uninterrupted live broadcasts, a beauty brand through the virtual anchor to achieve the average daily length of live broadcasts from 8 hours to 24 hours, the number of viewers to increase by 3 times, the cost of manpower to reduce by 60 % [88] “Social + Live + Cross-border” convergence. The integration mode of “live broadcast + cross-border” has given rise to new growth poles. SHEIN has established a “netizen live broadcast matrix” in TikTok, inviting KOLs from the United States and Europe to live broadcast wearing, and then synchronously jumping to the independent station to complete the purchase, which will drive its cross-border live broadcast GMV in Europe and the United States to reach 25 % of the GMV in 2023, which will increase the efficiency of new product exposure to 25 % [71]. In 2023, this model will drive the GMV share of cross-border live broadcasting in Europe and the United States to 25 %, and increase the efficiency of new product exposure by 40%. In addition, the depth of the application of AR

technology to reshape the live experience, Sephora in Instagram live introduction of “AR try makeup” function, the audience can click on the screen to virtually try lipstick, eyeshadow, data show that the function of the live purchase of the conversion rate increased by 27 %, the rate of return decreased by 12 % [70].

Under the dual role of policy and technology, social live e-commerce is facing new development opportunities: Southeast Asia launched a number of countries “live e-commerce support program”, such as Vietnam's cross-border live sellers to provide logistical subsidies, Vietnam's social live e-commerce scale in 2023, a year-on-year growth of 180 %; the European Union is to promote “live E-commerce compliance framework”, requiring the anchor to disclose the partnership, a French beauty brand therefore adjusted the live talk, after compliance with user trust increased by 15 %. In the future, with the maturity of AI multimodal interaction technology, “virtual anchor + real-time translation” will become a cross-border live standard, it is expected that in 2025 the global social e-commerce and live e-commerce market size will exceed 4 trillion U.S. dollars, of which the emerging markets (eg, the Middle East, Africa) in the social media penetration rate to improve the promotion of the payment infrastructure, the growth rate is expected to reach more than 35 %, and the growth rate is expected to reach more than 35%. The growth rate is expected to reach more than 35 %, and the model of “content as transaction” will further blur the boundaries between social and e-commerce, and promote the global consumer chain to “instant, scene, social” in-depth evolution (table 1.7).

Table 1.7 – Social Commerce and Live-streaming Platforms Comparison [21]

Platform	Core Model	2023 GMV	Key Features	Conversion Rate Advantage
Douyin E-commerce	Interest recommendation + Live	\$500B+	Content-driven	3x traditional
TikTok Shop	Short video + Live	\$20B+	Cross-border live	4x traditional
Kuaishou E-commerce	Trust-based + Live	\$170B+	Lower-tier market	High repurchase
Instagram Shopping	Brand store + Live	\$50B+	Social seeding	High conversion

The DTC (direct-to-consumer) model presents the distinctive features of “disintermediation, data-driven, experience reconstruction” globally, and is breaking down

the channel barriers of traditional retailing through direct connection between brands and consumers. From a global perspective, DTC brands generally bypass the dealer system through independent stations (built with SaaS tools such as Shopify) or flagship stores on e-commerce platforms to reach end-users directly, a model that gives the brand two core advantages: one is the autonomy to master user data, Warby Parker collects vision and aesthetic preference data from more than 20 million users through independent stations, feeding into product development.

The first is to master the user data autonomy, Warby Parker through the independent station to collect more than 20 million users eyesight, aesthetic preferences and other data to feed the product development, the new iteration cycle of its glasses shortened by 40% compared with the traditional brands [83] the second is to achieve high profit margins, Allbirds by virtue of the DTC model to cut down the dealer markup link, the gross profit margin is maintained at more than 60 % [2] far exceeding the average level of traditional footwear brands of 35-40 %. Regional development, the North American market is still the DTC innovation highland, accounting for 65 % of the total financing of the global DTC brand, the European market focuses on “sustainable + DTC” integration, the German outdoor brand Jack Wolfskin through the DTC model to promote environmentally friendly fabric products, 2023 official website repurchase rate of 42 % [45] The DTC model in emerging markets in Southeast Asia is characterized by “social e-commerce + localization”, and Indonesian beauty brand Kredivo will reach a penetration rate of 35 % among young consumers in Jakarta by 2023 through the cooperation of an independent Instagram station and online celebrities [50].

Typical examples include Allbirds, which drives global expansion with the dual-wheel drive of “environmental protection concept + DTC”, telling the brand's story of wool origin and carbon footprint through its official website, and reinforcing the awareness with offline “flash mob experience stores”. After entering the Chinese market in 2023, the environmental-themed flash store opened in Shanghai attracted more than 100,000 customers in a single month, driving the Tmall flagship store sales growth of 200 %; Casper has built an omni-channel closed-loop of “online official website + offline experience stores”, and its mattress products through the official website of the “100-day

free trial! Its mattress products through the official website “100 days free trial” policy to reduce the threshold of the purchase decision, the offline experience store only display products without sales, users experience the code to jump to the official website to place an order, in 2023, the model of the brand in Canada, the United Kingdom and other eight countries market share exceeded 15 % [12]. In terms of technology-driven trends, the combination of “independent station + SaaS tools” has become the standard for DTC brands, and Shopify launched “Shopify Plus” to provide cross-border DTC brands with automatic translation of multilingual pages, localization, and payment (e.g. GrabPay is supported in Southeast Asia). The “Shopify Plus” launched by Shopify provides cross-border DTC brands with automatic translation of multi-language pages, localized payment (such as Southeast Asia to support GrabPay, Latin America to access Mercado Pago) and other functions, and a Chinese 3C brand has built a Spanish independent website through the tool, and the order volume in Mexico increased by 300% year-on-year in 2023 [72]. LTV (user lifetime value), Dollar Shave Club in the U.S. locks male consumers with “monthly razor subscription + personalized gift box”, with more than 12 million subscription users in 2023, and the average annual consumption of a single user reaches \$180 [20, which is 3 times higher than that of a one-time purchase; in addition, “DTC + Metaverse” model increases order volume in Mexico by 300% year-on-year. In addition, the innovative exploration of “DTC + meta-universe” is sprouting. After Nike acquired the virtual shoe brand RTFKT, it sells NFT sports shoes through the DTC independent station, and users can wear them in the meta-universe scenarios after purchase, and the sales of the related digital products will exceed \$100 million in 2023, which will promote the extension of the DTC model from physical commodities to the virtual economy. Extension [60].

Changes in policies and consumption habits bring new opportunities for DTC mode: the U.S. Consumer Data Protection Act (CDPA) strengthens user data sovereignty, forcing traditional brands to turn to the DTC mode to control the data on their own; the EU's “New Consumption Initiative” encourages brands to directly connect with consumers, and a German organic food DTC brand has received government subsidies as a result. As a result, a German organic food DTC brand has received government subsidies, which will

increase the speed of European market expansion by 50 % in 2023. In the future, with the popularization of AI user profiling technology and Martech (marketing technology) tools, DTC brands will realize “1-to-1 personalized operation” - through the analysis of user browsing, purchasing, after-sales and other whole chain data, automatically pushing customized It is expected that the global DTC market will exceed USD 1.2 trillion in 2025, with a compound annual growth rate of 20 %, and emerging markets will become the new incremental battleground for the DTC model under the impetus of the improvement of logistics infrastructure (e.g., the coverage of Cainiao overseas warehouses in Southeast Asia has been increased to 70 %) and the awakening of consumers' brand awareness, and China will become the new incremental battleground for the DTC model with the popularization of supply chain and global DTC brands. The deep integration of China's supply chain with global DTC brands (e.g. cross-border independent station + flexible manufacturing in China) will also become the core trend of the industry (table 1.8).

Table 1.8 – DTC Brand Core Characteristics Comparison [2]

Brand	Category	Core Advantage	2023 Revenue	Gross Margin	Repurchase Rate
Allbirds	"Eco-friendly footwear"	"Sustainability + DTC"	"\$300M"	"60 %+"	-
Warby Parker	Eyewear	"User data-driven"	"\$600M"	"55 %"	-
Casper	Mattresses	"100-day trial"	"\$500M"	"50 %"	-
SHEIN	"Fast fashion"	"Flexible supply chain"	"\$40B+"	"50 %"	"35 %"
Anker	"Charging devices"	"Amazon + DTC"	"\$2B+"	"45 %"	"35 %"

B2G (business-to-government) e-commerce in the global context presents a significant feature of “policy-driven digitalization, uneven regional development”, is becoming the core carrier of the digital transformation of government and enterprise collaboration. From the global point of view, the government procurement digitalization process is accelerating, the EU explicitly requires member states to achieve 100 % e-procurement by 2025 [25] and its “e-Government Action Plan” promotes the public

sector to release bidding requirements through a unified platform, and the German federal government will reach 870 million e-procurement transactions in 2023. E-procurement platform turnover reached 87 billion euros in 2023 [33] compared with the traditional paper bidding efficiency by 40 %; developing countries through localized platforms to break through procurement barriers, India GeM (Government e-Marketplace) platform integration of government procurement needs of the country's 28 states, support for small and medium-sized enterprises to participate in infrastructure projects through online bidding, platform turnover in 2023 The transaction volume of the platform in 2023 will exceed 120 billion U.S. dollars [32, of which the proportion of IT equipment and medical supplies procurement reaches 65 %. Regional development differences are significant, North America, Europe and other mature markets have formed a standardized e-procurement system, the U.S. government through the GSA Advantage! platform to achieve office supplies, IT services, the entire process of online, the federal government e-commerce procurement rate of 92 % in 2023 [3] and Southeast Asia, Africa and other regions are still in the stage of infrastructure construction, Indonesia through the “e-Procurement” platform. Indonesia through the “e-Procurement” program to upgrade the government procurement system, in 2023, Jakarta region, the proportion of electronic bidding projects increased to 35 %.

Typical cases such as Amazon Business cut into the B2G market by virtue of its supply chain integration ability, providing office supplies, laboratory equipment and other procurement services for the U.S. federal government, state municipalities, and its “government-specific pricing + fast approval” process shortens the procurement cycle from the traditional 21 days to 7 days, and the sales volume of the U.S. government business segment exceeded \$15 billion in 2023, with the sales volume of the business segment exceeding \$15 billion in 2023. In 2023, the U.S. government sales exceeded 15 billion U.S. dollars; China Government Procurement Cloud has built a government procurement ecosystem covering the whole country, connecting more than 3 million suppliers and government agencies at all levels, and in the procurement of epidemic prevention materials through the mode of “online bidding + emergency redeployment” to provide more than 2,000 districts and counties with materials such as face masks, nucleic

acid testing equipment, etc., and the order processing efficiency is higher than that of the traditional government procurement services. In 2023, we will provide masks, nucleic acid testing equipment and other materials to more than 2,000 districts and counties nationwide, and the order processing efficiency will be increased by 3 times compared with the traditional mode. However, the industry is facing two core challenges: first, the compliance requirements are stringent, enterprises participating in government procurement need to pass ISO 9001, ISO 14001 and many other certifications, a Chinese medical device company to enter the EU B2G market, only the certification process took 18 months, the cost increased by 25 %; second, the bidding cycle is long and the process is complex, the World Bank data show that developing countries' government e-commerce procurement World Bank data shows that the average bidding cycle of government e-commerce procurement in developing countries is 45 days, which is 30 days longer than that of business-to-business B2B transactions, and the process needs to be simplified through blockchain smart contracts and other technologies [13].

Driven by technology, B2G e-commerce is moving towards “intelligence and transparency”: blockchain technology is applied to the whole process of procurement certification, Singapore's government e-procurement platform records the hash value of bidding documents through blockchain, and the questioning and complaint rate of related projects will drop by 60 % by 2023; the application of the AI bid evaluation system in India's GeM platform will realize the automatic scoring of technical bids, and reduce the rate of evaluation of technical bids. It realizes automatic scoring of technical bids and compresses the bid evaluation time from 5 days to 8 hours, and an infrastructure project thus starts 3 months ahead of schedule. At the policy level, countries are accelerating the improvement of B2G e-commerce regulations, South Korea launched the Public Procurement Innovation Promotion Act, which allows small and medium-sized enterprises (SMEs) to participate in government e-tendering through credit guarantees, and the bidding rate of SMEs in South Korea's B2G e-commerce market will be increased to 38 % in 2023 [73] the African Union launched the “Digital Government Program”, which plans to promote unified e-government in 54 member states before 2025 (table 1.9).

Table 1.9 – B2G E-commerce Regional Development Comparison [3]

Region	Platform/Model	Digitalization Level	2023 Transaction Value	Main Categories
United States	"GSA Advantage/Amazon Business"	"92 %"	"\$150B+"	"Office supplies/IT equipment"
European Union	"Unified e-procurement platform"	"80 %"	"€87B"	"Public services"
India	"GeM platform"	"35 %"	"\$120B"	"Healthcare IT"
China	"Government procurement cloud"	"90 %+"	-	"Pandemic supplies/office"

The African Union has launched the “Digital Government Program” and plans to promote a unified e-procurement platform in 54 member states before 2025, which is expected to drive the scale of regional B2G e-commerce to exceed \$50 billion. In the future, with the expansion of 5G government network coverage and the popularization of low-code development tools, B2G e-commerce will realize “unmanned process” - from the release of demand, supplier matching to contract signing are automatically completed by the AI system, and it is expected that the global B2G e-commerce market size will exceed 38 % in 2025.

It is expected that the global B2G e-commerce market will exceed \$3 trillion in 2025, with a compound annual growth rate of 18 %, and emerging markets will become the main growth pole of the B2G model under the impetus of the “wave of digital infrastructure”, and China and the United States will deeply participate in the construction of the global public service through the B2G e-commerce with their technological solutions and supply chain capabilities.

1.3 E-commerce Technology

Global e-commerce technology is iterating in the core direction of “intelligent, collaborative and immersive”, deeply reshaping the transaction chain and user experience. In terms of core technology application and global practice, artificial intelligence and machine learning are widely used in intelligent recommendation and search, for example,

Amazon has increased the accuracy of product recommendation to 80 % through deep learning, and its “predictive shopping” function will increase the repurchase rate by 25 % [3] by 2023, while Southeast Asia's Shopee optimizes the search term association with NLP technology, enabling Indonesia to optimize the search term association with NLP technology. Search term association, so that the Indonesian market search conversion rate increased by 30 % [69] automated customer service field, Facebook Marketplace's AI chatbot in 2023 to deal with the world's more than 500 million inquiries, the United States, Zendesk's AI customer service system will be compressed to 15 seconds of response time [87] dynamic pricing algorithms, Uber Eats through the real-time supply and demand model in the peak hours of New York to improve pricing efficiency by 40 %, and Uber Eats to improve pricing efficiency by 40 % during peak hours [79]. In terms of dynamic pricing algorithms, Uber Eats improved its pricing efficiency by 40 % during the peak hours, and India's Flipkart's “flash pricing” system updated its prices every hour, increasing GMV by 60 % during the promotion period. Blockchain technology in the supply chain traceability, Walmart and IBM cooperation Food Trust platform to achieve the whole process of food traceability, the United States in 2023 Instacart through this to reduce the food safety complaint rate of 50 % [82] decentralized transactions, South Korea's Coupang pilot blockchain payment, the user with the cryptocurrency settlement to enjoy a 5% discount in 2023, the pilot transaction more than 100,000 times [15] Africa's Jumia in the pilot of the blockchain payment, the user with the cryptocurrency settlement to enjoy a discount, the pilot transaction more than 10 In the field of decentralized transactions, South Korea's Coupang piloted blockchain payment, users can enjoy a discount with cryptocurrency settlement, and the pilot transaction will exceed 100,000 times in 2023, and Africa's Jumia launched blockchain cross-border payment in Nigeria, which shortened the settlement cycle from 7 days to 24 hours [47]. IoT and edge computing in intelligent warehousing and logistics, Alibaba Cainiao network “black light warehouse” through IoT equipment to realize automated sorting, shenzhen warehouse processing efficiency up to 2,000 single/hour, compared with the traditional warehouse to improve 5 times, the United States FedEx IoT parcel tracking system to make the global parcel real-time positioning rate of 98 % [28] On real-time inventory management, Japan's

Rakuten deployed IoT shelf sensors in Southeast Asia to automatically trigger replenishment, allowing the Thai market inventory turnover rate to increase by 35 % [67] and the UK's Ocado's smart supermarket recognizes merchandise pickup behaviors through cameras and sensors, with a self-service billing success rate of 99 % in London stores in 2023 [61]. Extended reality and meta-universe in the field of AR try-on trial, Sephora's AR beauty trial tool makes the U.S. market conversion rate increased by 45 % [70, IKEA AR application IKEA Place in 2023 to drive the global furniture online sales growth of 30 % [42] virtual shopping scenarios, South Korea's Coupang Play's meta-universe shopping malls in 2023 the virtual fitting room used more than 1 million times, the The order rate is two times higher than that of traditional pages [15, and Nike of the United States has opened Nikeland in Roblox, with virtual goods sales exceeding \$100 million in 2023 [60] (table 1.10).

Table 1.10 – E-commerce Core Technology Architecture [3]

Technology Domain	Core Technologies	Application Scenarios	Representative Cases
AI & Machine Learning	Deep Learning, NLP, AI Customer Service	Recommendation systems, Search optimization, Intelligent response	Amazon 80% accuracy, Shopee +30 % conversion
Blockchain Technology	Smart contracts, Distributed ledgers	Cross-border payments, Supply chain traceability, Contract management	Walmart Food Trust, Maersk TradeLens
IoT & Edge Computing	Smart warehousing/Sensor networks	Automated sorting, Inventory management, Real-time tracking	Cainiao black light warehouse, FedEx 98 % tracking
Extended Reality (XR) & Metaverse	AR try-on, VR shopping, Virtual avatars	Virtual try-on, Immersive experiences, Brand interaction	Sephora +45 % conversion/Nike Nikeland

Among the typical cases of regional technological innovation, the “interest recommendation algorithm” of China's Jieyin e-commerce company will have more than 2,000 live broadcasts with a GMV of over 100 million in 2023, and the Beijing warehouse of Jingdong Logistics' “Asia One” intelligent warehouse will process 1 million orders per day and export the technology to Southeast Asia; Amazon's “Asia One” intelligent warehouse in the United States will be used more than 1 million times than traditional pages. To Southeast Asia; Amazon's “Just Walk Out” unmanned store technology in the

United States in 2023, more than 50 stores, the average daily traffic of a single store increased by 60 %, SHEIN's AI design system in the Brazilian market new product iteration speed than the local brand 3 times faster; Southeast Asia Gojek's super application through API Southeast Asia Gojek's super application through API integration services, the average daily use of Indonesian users for more than 70 minutes, its delivery algorithm will control the average delivery time in Jakarta within 25 minutes, Shopee's “live + small game” technology in Malaysia during the promotion to allow users to stay longer than 45 minutes.

Future technology trends, generative AI will reshape the e-commerce chain, 80 % of e-commerce product pages are expected to be generated by AI in 2025, Wayfair pilot AI-generated furniture scene diagrams to reduce design costs by 70 %, L'Oreal plans to launch an AI virtual beauty consultant in Europe in 2024, which can cover 90 % of the consultation needs; omni-channel real-time data center, SHEIN in Brazil In terms of omni-channel real-time data center, SHEIN deployed edge servers in Brazil to increase user access speed by 40 %, and China Temu's global data center integrates 1 billion commodities data to support Europe and the United States' “3-day delivery”; in green technology and sustainable e-commerce, Walmart requires suppliers to upload carbon emission data through blockchain by 2025, and the United States' Thrive Market The United States Thrive Market to visualize the carbon footprint of organic food and drive a 25 % increase in sales, Amazon's Prime Air drone delivery in the United Kingdom to complete more than 100,000 orders in 2023, reducing carbon emissions by 80 %, China's Cainiao's global electric delivery fleet in Southeast Asia to reduce fuel consumption by more than 10 million liters/year (table 1.11).

Table 1. 11 – AI Application Effectiveness in E-commerce [87]

Application Area	AI Technology	Performance Improvement	Representative Company
Personalized Recommendations	Deep Learning	+25 % conversion rate	Amazon
Intelligent Customer Service	NLP	-70 % response time	Zendesk
Dynamic Pricing	Real-time algorithms	+40 % efficiency	Uber Eats
Demand Forecasting	Machine Learning	-20 % inventory cost	Alibaba
Visual Search	Image Recognition	+30 % search conversion	Shopee
Automated Sorting	Robotics	+400 % efficiency	JD Logistics

Web3.0 and decentralized e-commerce, the U.S. Under Armour plans to launch a blockchain-based e-commerce system by 2024 to support the “3-day delivery” in Europe and the United States. launch a blockchain-based membership points system in 2024, and South Korea's Coupang piloted a DAO governance model, with a 35 % increase in the repurchase rate of pilot goods in 2023 (table 1.12).

Table 1.12 – Blockchain Technology Applications and Value in E-commerce [82]

Application Scenario	Technical Mechanism	Business Value	Maturity
Cross-border Payments	Distributed ledger	Settlement: 7 days → 24 hours	High
Product Traceability	Immutable records	-45 % dispute rate"	High
Smart Contracts	Automatic execution	-20 % contract processing time	Medium
Supply Chain Finance	Tokenization	+40 % financing efficiency	Medium
Loyalty Points	Tokenization	Cross-platform circulation	Low

Overall, global e-commerce technology is evolving from an “efficiency tool” to an “ecological infrastructure”, with AI and blockchain solving trust and efficiency problems, XR and IoT reconfiguring the boundary of experience, and Web3.0 and green technology promoting the industry to decentralization and sustainable development. The future technology competition will focus on “global localization”, and the technology solutions of China, the United States and Southeast Asia will become the core model of global e-commerce digitization.

Chapter 2 E-commerce Status

2.1 Global E-commerce Market Size and Growth Trends

The global e-commerce market has entered a mature phase characterized by "steady growth and structural optimization" in the 21st century. While the explosive growth during the pandemic has slowed, the consolidation of digital consumption habits, the unlocking of emerging markets' potential, and continuous technological innovation have driven steady market expansion. According to a joint forecast by eMarketer and Statista, global e-commerce sales reached \$6.3 trillion in 2023, marking a 10.5 % year-on-year increase. The market is projected to exceed \$8 trillion by 2025, with a range of \$7.4 to \$8.5 trillion, demonstrating strong resilience [23] (figure 2.1).

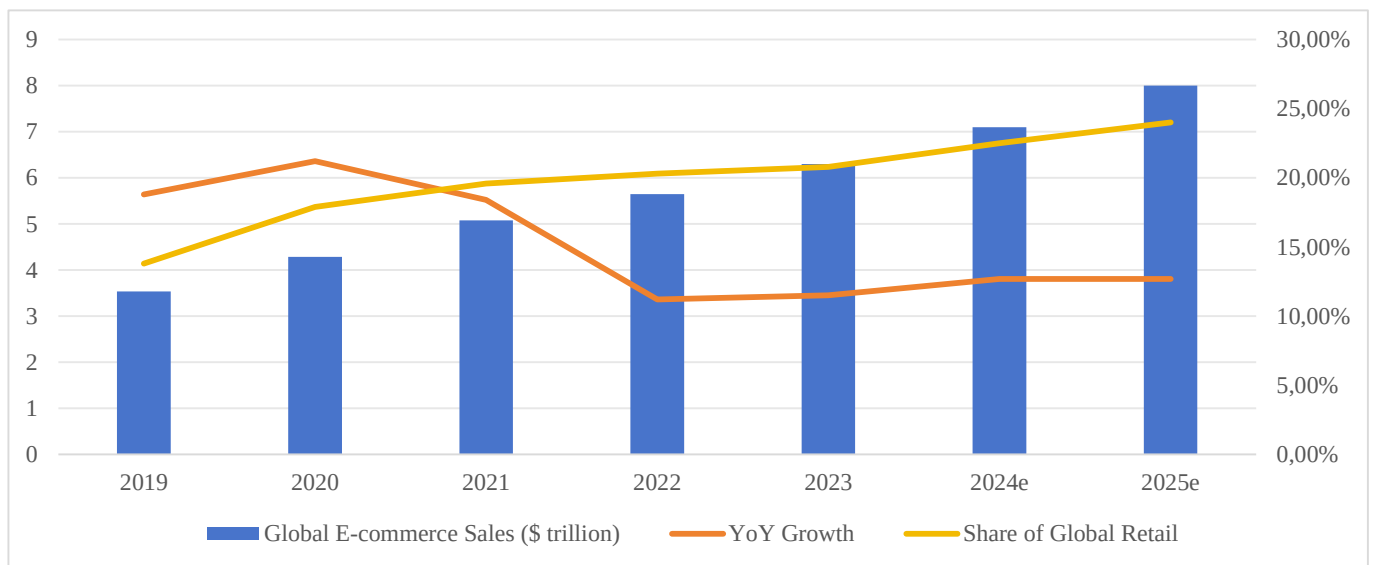


Figure 2.1 – Global E-commerce Market Size and Growth Trends (2019-2025) [23]

From a longer-term perspective, the global e-commerce market maintained a high compound annual growth rate (CAGR) of 9-11 % between 2016 and 2025 [23] achieving a leapfrog growth from \$2.3 trillion to \$8 trillion. This growth trajectory not only far exceeded the average global GDP growth rate but also significantly outpaced the growth level of traditional retail industries. By 2025, e-commerce's share of global retail sales is projected to rise from 20.8 % in 2023 to 24 %-25 % [74] meaning that one out of every four dollars spent on retail will come from online channels. E-commerce has become an

irreversible core growth engine for the global retail industry.

In terms of market structure, commodity e-commerce continues to dominate, while the growth potential of service e-commerce is accelerating. By 2025, global commodity e-commerce sales are projected to account for 83 % of total sales, with apparel, footwear, food & beverages, and 3C electronics (computers, communications, and consumer electronics) as the three core categories. Service e-commerce (covering streaming, travel, tourism, and digital services) is expected to rise to 17 % of the market, with a compound annual growth rate (CAGR) of 15 % [80] emerging as a new growth driver. Notably, food & beverage, a latecomer in commodity e-commerce, currently has an online penetration rate below 10 % significantly lower than the overall e-commerce average of 23 %. However, it is projected to achieve a CAGR of 10 % between 2025 and 2030, with its online penetration rate rising to 11 % by 2030. This will elevate its share of total e-commerce sales from 14 % to 17 %, solidifying its position as a key category driving market growth.

From 2020 to 2024, the global e-commerce market witnessed a development trend from steady growth to explosive expansion and then to deep improvement. Taking 2019 as the base year, the data shows that the global e-commerce sales volume soared to approximately 26.7 trillion US dollars. At this time, the global e-commerce market was in a period of steady growth, with an annual growth rate of about 20 %. By 2020, under the circumstances of the pandemic lockdown, online shopping had developed rapidly, and global consumers' online shopping expenditure reached 4.29 trillion US dollars, increasing by 24.1 % compared to the previous year [80]. In 2021, the global e-commerce market continued to experience rapid growth, with global e-commerce sales reaching 5.08 trillion US dollars, representing a year-on-year increase of approximately 18.7 %. In 2022, after the lifting of pandemic measures and the recovery of offline consumption, the supply chain crisis dampened people's confidence in consumption, and the global e-commerce market entered a period of adjustment. The global e-commerce sales for that year reached 5.13 trillion US dollars, with a year-on-year growth of approximately 6%. In 2023, global e-commerce sales reached 5.65 trillion US dollars, with a year-on-year growth of approximately 9.7 %. The growth of the global e-commerce market has gradually shifted

from "quantity" to "quality", and the global e-commerce economy has entered a new development model [74]. In 2024, global e-commerce sales are expected to reach 6.09 trillion US dollars, with a year-on-year growth of approximately 8.4 %, maintaining a relatively high single-digit growth rate (figure 2.2).

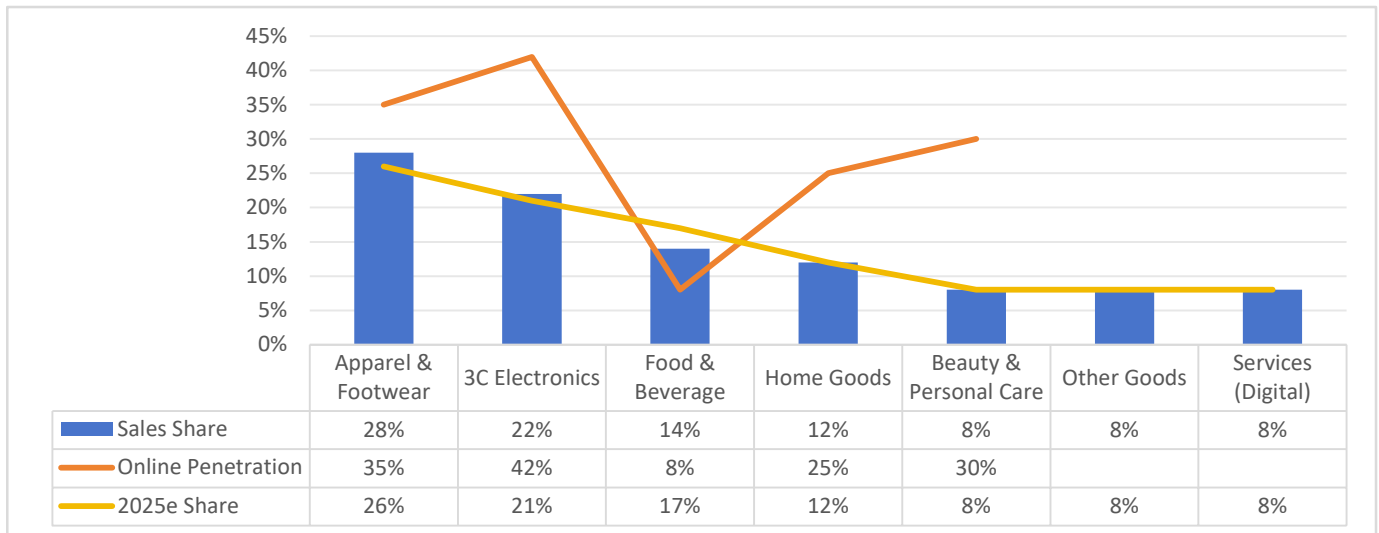


Figure 2.2 – Global E-commerce Category Structure (2023) [74]

Growth drivers: From scale expansion to quality improvement The growth dynamics of the global e-commerce market are undergoing a profound transformation, shifting from the early reliance on user base expansion for 'incremental dividends' to a new paradigm driven by technological innovation, service upgrades, and product category expansion for 'quality dividends'. Specifically, the core drivers of market growth can be summarized in three key dimensions: First, the sustained empowerment of technological innovation. The deep integration of digital technologies-including artificial intelligence, big data, cloud computing, and blockchain-has revolutionized e-commerce efficiency and user experience. Personalized recommendation algorithms have made "products finding customers" a reality, with Amazon's recommendation system driving billions in annual sales growth. Cloud computing ensures platform stability during peak promotional periods while reducing technical costs. Blockchain technology plays a pivotal role in supply chain traceability and cross-border payment security. The Walmart-IBM food blockchain tracking system, for instance, has significantly improved recall efficiency and transparency. The second factor is the irreversible transformation of consumption habits. The online

shopping habits cultivated during the pandemic have become deeply ingrained, with over 80 % of global consumers making at least one mobile purchase weekly, establishing mobile shopping as the dominant consumption scenario. As consumers' demands for convenience, personalization, and diversity continue to escalate, e-commerce platforms are constantly optimizing their service processes. From the widespread adoption of Buy Now Pay Later (BNPL) payment models to the full coverage of instant delivery services, and the rapid iteration of customized products, these developments all represent precise responses to evolving consumer needs. Third, the potential of emerging markets is being unleashed. Emerging markets such as India, Southeast Asia, Latin America, and Africa have become the core drivers of global e-commerce growth, fueled by their low online penetration rates, large young populations, and rapidly expanding mobile internet adoption. These markets typically see e-commerce growth rates exceeding 20 %, contributing over 60 % of global growth and reshaping the regional landscape of e-commerce [37] (table 2.1).

Table 2.1 – Global E-commerce Growth Drivers Analysis Framework [84]

Driver Dimension	Core Elements	Specific Performance	Impact Level
Technological Innovation	AI,Big Data, Blockchain	Recommendation algorithms, Smart customer service, Supply chain traceability	★★★★★
Consumption Habits	Mobile shopping, Instant demand	80% of users shop weekly via mobile	★★★★☆
Emerging Markets	Southeast Asia, Latin America, Africa	20%+ growth, 60 % of global growth	★★★★★
Payment Penetration	Digital wallets, BNPL	30 %+ BNPL coverage	★★★★☆
Logistics Improvement	Overseas warehouses, Smart delivery	Cross-border delivery: 5-7 days	★★★★☆

Growth Characteristics: Coexistence of Regional Differentiation and Category Upgrading The global e-commerce market demonstrates pronounced regional divergence, with mature markets and emerging markets contrasting sharply. Mature markets (North America, Europe, Japan, and South Korea) maintain steady growth at 6-7 % CAGR through high online penetration, driven by service e-commerce expansion and operational

efficiency improvements. Emerging markets (Asia-Pacific, Latin America, Africa) are in a golden phase of rapid penetration growth, with CAGRs exceeding 20 % and emerging as the new growth engine for global e-commerce. The category growth landscape reveals a dual pattern: essential goods maintain steady growth while premium categories achieve rapid expansion. Essential categories like food & beverages and home goods sustain robust 10-15 % growth through instant retail development. Meanwhile, 3C electronics and fashion apparel drive differentiated growth via technological innovation and social marketing. Premium categories such as health & beauty, smart home, and eco-friendly products lead the pack with over 18 % CAGR, reflecting consumers' pursuit of quality living [23] (table 2.2).

Table 2.2 – Global E-commerce Regional Growth Comparison (2023) [74]

Region	Market Size (\$B)	YoY Growth	Online Penetration	Core Drivers
China	2400	9.5 %	27 %	Live commerce, Instant retail
United States	1100	10.2 %	22 %	Prime membership, FBA
Europe	880	7.5 %	18 %	Sustainability, Compliance
Southeast Asia	320	20.5 %	12 %	Social commerce, Mobile payments
Latin America	250	18.3 %	11 %	Localized platforms, Installments
Middle East	120	22.0 %	10 %	High order value, Cross-border
Africa	50	24.0 %	5 %	Mobile-first, E-commerce

The regional disparities in the global e-commerce market stem from multiple factors, primarily including the following aspects:

First, the level of economic development and consumption capacity. Regions such as North America, Europe, and China have higher per capita GDP and strong consumer purchasing power, providing a solid demand foundation for the development of e-commerce; while Africa and some Southeast Asian countries have relatively lower levels of economic development and limited consumption capacity, which has constrained the rapid expansion of e-commerce.

The second is the construction of digital infrastructure. China, the United States, and Europe have an internet penetration rate of over 80 %, with mobile payment penetration

exceeding 70 %, and a well-established logistics distribution system, providing technical support for the development of e-commerce [64; while regions such as India and Africa have seen rapid improvements in digital infrastructure in recent years, but issues such as uneven coverage and high costs still exist, affecting the penetration speed of e-commerce (figure 2.3).

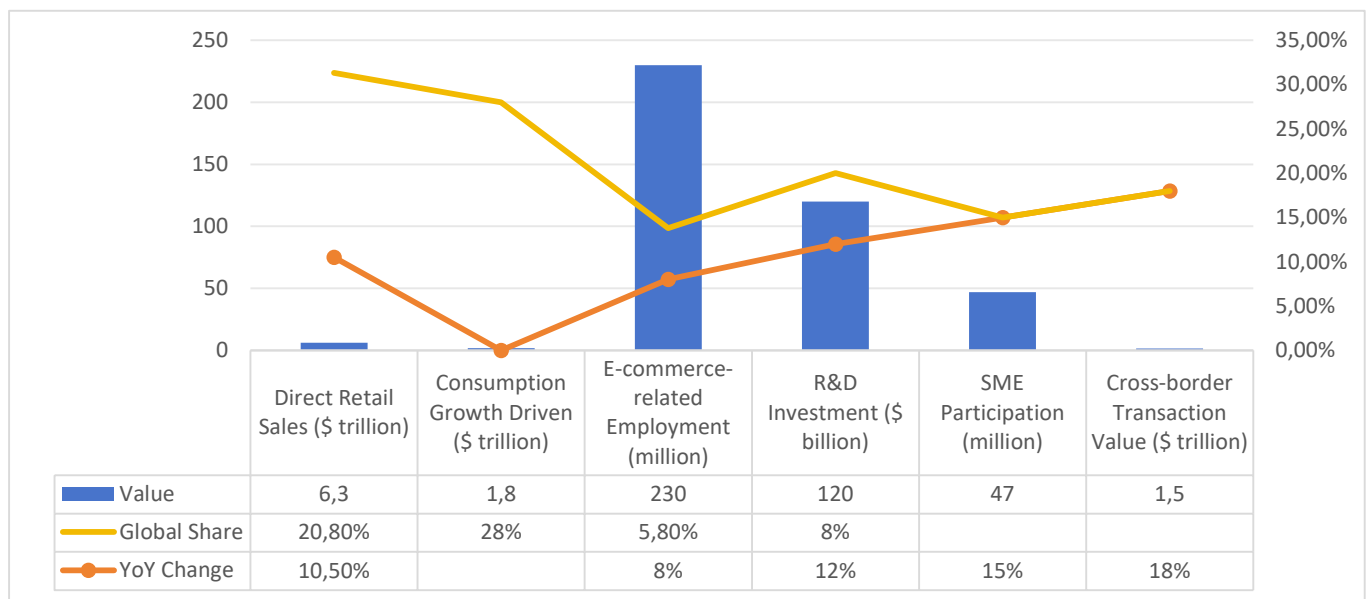


Figure 2.3 – E-commerce Direct Contribution to Global Economy (2023) [80

Third, the policy environment and market regulation. China's comprehensive pilot zone policy for cross-border e-commerce [75, the U.S. "Big and Beautiful Act", and the EU's "Digital Markets Act" have shaped the regional market environment from the perspectives of support and encouragement [81] compliance regulation, etc., directly impacting the development of e-commerce. Fourth, cultural and consumption habits. Consumers in Southeast Asia and Latin America favor social shopping, driving the rise of social e-commerce platforms like TikTok Shop and Shopee. In contrast, European consumers prioritize privacy protection and product quality, prompting platforms to increase investments in data compliance and quality control [26] (table 2.3).

As a core component of the digital economy, e-commerce has exerted comprehensive and profound impacts on the global economy by restructuring transaction processes, optimizing resource allocation, and reducing transaction costs. The following analysis examines its pivotal role from both macro and micro perspectives, integrating classical

economic models with empirical data.

Table 2.3 – E-commerce Transaction Cost Reduction Effect [27]

Transaction Cost Type	Traditional Model	E-commerce Model	Reduction
Search Cost	Hours-Days	Seconds	99 %
Information Asymmetry	High	Medium-Low	40-60 %
Cross-border Fulfillment Cost	\$20-30/item	\$5-10/item	50-60 %
Payment Settlement Cycle	3-7 days	Real-time-1 day	70-85 %
Intermediary Markup	50-100%	15-30%	50-70 %
Geographic Distance Elasticity	-1.366	-0.470	65 %

Analysis Based on Transaction Cost Theory. The transaction cost theory holds that the core obstacles in market transactions are information asymmetry, search costs, negotiation costs, and performance costs. E-commerce reconstructs transaction processes through digital technology, significantly reducing various transaction costs, thereby enhancing market efficiency.

From the perspective of information asymmetry, e-commerce platforms enable consumers to obtain more comprehensive product information and merchants to accurately understand consumer needs through mechanisms such as user reviews, product traceability, and third-party quality inspection, significantly reducing the degree of information asymmetry. Taking China's Taobao platform as an example, the product review system and Sesame Credit scoring mechanism have improved consumer decision-making efficiency by 30 % and reduced merchants' customer acquisition costs by 25 %.

From the perspective of search costs, e-commerce platforms have broken down physical space barriers by consolidating global products into a unified online marketplace. Through search algorithms, consumers can locate target items within seconds, with search costs approaching zero. Fan et al. (2017) found that the elasticity of distance in online trade (-0.470) is significantly lower than in offline trade (-1.366), indicating that e-commerce substantially reduces consumers' sensitivity to shipping distances. This enables access to products from a wider range of origins, greatly expanding consumer choice [86].

From the perspective of fulfillment costs, the improvement of global logistics

networks and digital payment systems has significantly enhanced the efficiency of cross-border transactions. Amazon's FBA logistics system and China's Cainiao Network have reduced cross-border delivery time from several weeks to 3-7 days; the widespread adoption of mobile payments and digital wallets has shortened payment settlement time from several days to real-time arrival, substantially lowering the cost of capital occupation.

The decline in transaction costs has directly fueled the expansion of global trade. According to WTO data, the global cross-border e-commerce transaction volume grew at a compound annual rate of 18 % between 2015 and 2025, significantly outpacing the 6 % growth rate of traditional trade. E-commerce has now become the primary driver of global trade growth.

Market Expansion Effect Based on Long Tail Theory. The long-tail theory posits that in traditional retail, limited shelf space drives merchants to prioritize high-demand 'hot items' (the head), whereas e-commerce's boundless online platforms allow 'cold items' (the long tail) to aggregate into a substantial market, catering to consumers' personalized needs.

The growth of e-commerce has fully unleashed the long-tail effect. The global e-commerce market has expanded from millions to hundreds of millions of product categories by 2025, with personalized and niche items now accounting for 25 % of total sales—a 5 % increase. Etsy, for instance, specializes in handmade crafts and retro collectibles, with projected sales exceeding \$20 billion by 2025, demonstrating the vast potential of the long-tail market. Meanwhile, TikTok Shop's immersive social commerce model in Mexico has propelled niche products like Aztec-totem painted masks and wrestling gear to viral popularity through short videos, achieving exponential sales growth and showcasing the explosive potential of long-tail goods [24]. The long-tail effect not only enriches consumer choices but also promotes the diversified development of the market, providing survival space for small and medium-sized enterprises and individual entrepreneurs.

On the Amazon platform, third-party sellers contribute over 60 % of sales, with more than 70 % of them focusing on niche categories [3]; on the China Taobao platform, the number of "Taobao Villages" has reached over 7,000, creating employment for tens of millions of people and becoming a significant force in rural revitalization [16].

Industrial upgrading effect based on scale economy and scope economy. E-commerce can make enterprises achieve greater scale economy and scope economy, promote industrial upgrading and efficiency improvement by integrating global resources.

In terms of economies of scale, e-commerce platforms enable enterprises to break geographical constraints, reach global consumers, and achieve large-scale production and sales. China's Shein leverages e-commerce platforms to integrate global supply chains, realizing a scale effect with tens of thousands of new clothing items launched daily, reducing product costs by over 30 % [71]. Amazon, through centralized procurement and large-scale logistics, offers products at an average price 15%-20% lower than traditional retail, enhancing consumer welfare [3].

In terms of economies of scope, e-commerce platforms have achieved a "one-stop" consumer experience by integrating diverse services such as e-commerce, finance, logistics, and entertainment through an ecosystem approach, thereby enhancing user retention and platform value [3]. Alibaba has built a comprehensive ecosystem covering "consumption, payment, logistics, and finance" through the synergy of its Taobao, Tmall, Alipay, and Cainiao Network businesses, with over 1 billion active users within the ecosystem by 2025 [1]. Amazon has developed a diversified "consumption + service" revenue model by integrating e-commerce, cloud computing (AWS), and digital streaming (Prime Video), with AWS generating a profit margin exceeding 30 % and providing stable cash flow support for its e-commerce operations [6].

Macro-level Contribution to Global Economic Growth. E-commerce has made important contribution to global economic growth by stimulating consumption, promoting employment and promoting innovation.

From the perspective of consumption-driven growth, e-commerce has stimulated the growth of consumer demand by enhancing consumption convenience, enriching product varieties, and reducing product prices. In 2025, the contribution of global e-commerce to consumption growth reached 28 %, and in major markets such as China and the United States, this proportion exceeded 35 %. The study by Couture et al. (2021) found that the establishment of "Taobao Villages" in China significantly improved consumption levels in rural areas, particularly in the consumption of durable goods and new products,

demonstrating the stimulating effect of e-commerce on consumption.

From the perspective of employment promotion, e-commerce has directly driven the growth of emerging job opportunities such as e-commerce operations, logistics distribution, and live-streaming sales, while indirectly boosting employment expansion in related industries like supply chains and manufacturing. By 2025, the number of e-commerce-related jobs worldwide has reached 230 million, accounting for 5.8 % of the global total. Among them, China's e-commerce-related employment exceeds 70 million, the United States reaches 30 million, and emerging markets such as India and Southeast Asia have seen e-commerce employment growth rates exceeding 30 % [44].

From an innovation-driven perspective, the growth of e-commerce has catalyzed diverse new business models including live-streaming commerce, instant retail, social commerce, and cross-border e-commerce, while accelerating the innovative application of digital technologies. By 2025, global R&D investment in e-commerce is projected to reach \$120 billion, accounting for 8 % of total global tech R&D expenditure. Technologies such as artificial intelligence, big data, and blockchain are being increasingly integrated into e-commerce, providing vital momentum for innovation in the global digital economy.

2.2 The Success Stories of Global E-commerce Giants: Amazon and Alibaba

As two titans of the global e-commerce industry, Amazon and Alibaba represent the distinct development trajectories of North America and the Asia-Pacific market, respectively. Their success stories have not only shaped their own business empires but also profoundly influenced the global e-commerce landscape. While both companies center their operations on e-commerce, they exhibit significant differences in strategic choices, business models, and operational logic, having pursued distinct paths: Amazon's "technology-driven precision operations" and Alibaba's "open platform ecosystem development".

Founded in 1994 as an online bookstore, Amazon has evolved into a global tech titan spanning e-commerce, cloud computing, digital streaming, and artificial intelligence. In 2024, its e-commerce sales reached nearly \$1.2 trillion, capturing over 35 % of the U.S.

market share while boasting more than 500 million active users worldwide. The company's success stems from technological innovation, precision operations, and seamless integration of its global supply chain [3 (figure 2.4).

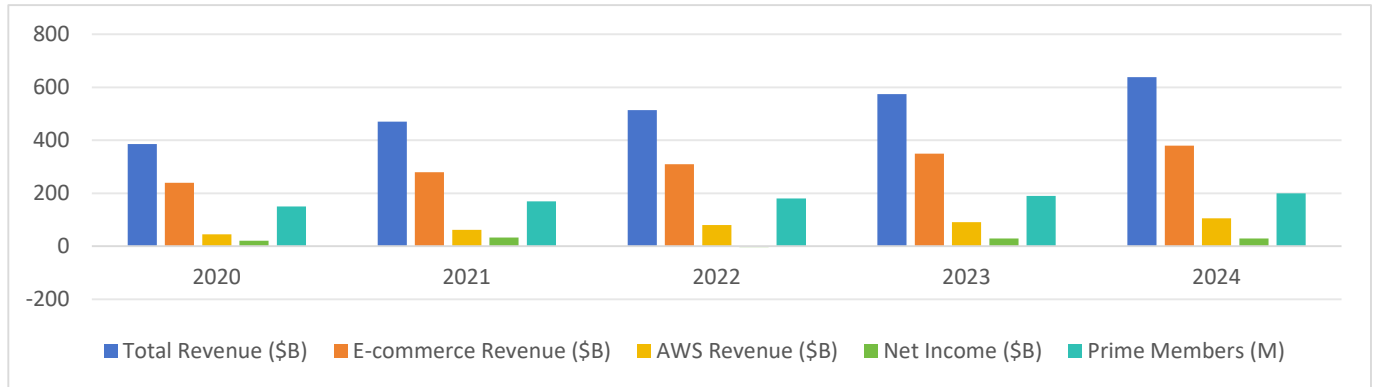


Figure 2.4 – Amazon Core Business and Growth Data (2020-2024) [3

Technological Innovation: Customer-oriented Technology R&D System. Amazon has consistently positioned technological innovation as its core competitive advantage, building a comprehensive R&D ecosystem that spans all business processes with the dual objectives of enhancing user experience and optimizing operational efficiency. Its technological innovations are primarily manifested in three key dimensions:

The first innovation lies in front-end user experience. As the world's first e-commerce platform to introduce the "one-click purchase" feature, Amazon has dramatically streamlined the shopping process and boosted user conversion rates. Its personalized recommendation algorithm, leveraging multi-dimensional data including browsing history, purchase behavior, and search records, delivers highly relevant product suggestions. These recommendations achieve over three times the click-through and conversion rates of standard items, generating billions of dollars in additional annual sales for the platform. Furthermore, Amazon's "Alexa smart speaker + e-commerce" model has revolutionized voice shopping. By 2025, e-commerce transactions within the Alexa ecosystem are projected to exceed \$50 billion, emerging as a new growth driver [3].

The second innovation lies in mid-tier operational efficiency. Leveraging big data analytics and AI technologies, Amazon optimizes supply chain management and inventory allocation. Its Predictive Inventory Management System (PIMS) forecasts product demand

based on historical sales data, market trends, and weather conditions, then precisely deploys goods to warehouses nearest to consumers for "nearby shipping". This achieves a 40 % increase in delivery efficiency and a 25 % improvement in inventory turnover rate. Additionally, Amazon extensively employs robotic technology in logistics. Its Kiva warehouse robots automatically handle product handling, sorting, and packaging, boosting warehouse operational efficiency fivefold while reducing labor costs by 30 %.

The third aspect involves innovation in backend technological infrastructure. Amazon Web Services (AWS), the company's cloud computing platform, not only provides robust technical support for its e-commerce operations and ensures system stability during peak promotional periods, but has also grown into the world's largest cloud service provider. By 2025, AWS is projected to generate over \$180 billion in revenue with a 32% profit margin, delivering stable cash flow and R&D funding for Amazon's e-commerce business. Meanwhile, AWS's elastic computing capabilities, big data analytics tools, and AI services empower e-commerce's technological upgrades, creating a virtuous cycle of R&D → business application → monetization [6 (table 2.4).

Table 2.4 – Amazon Technology Innovation Effectiveness Assessment

Technology Application	Function	Performance Indicator	Industry Leadership
Recommendation Algorithm	Personalized product recommendations	+25 % conversion rate	★★★★★
Predictive Inventory System	Demand forecasting + local stocking	+40 % delivery efficiency	★★★★★
Kiva Robotics	Smart warehouse sorting	+400 % efficiency, -30 % labor cost	★★★★★
Alexa Voice Shopping	Voice-interactive ordering	\$50B estimated GMV by 2025	★★★★☆
Just Walk Out	Checkout-free technology	+60 % store traffic	★★★★☆
Prime Air	Drone delivery	30-minute delivery	★★★★☆

Supply Chain and Logistics: Building a Global Integrated Performance Network. A key strength of Amazon lies in its world-leading supply chain and logistics network. By combining in-house logistics with third-party partnerships, it has built a global fulfillment

network that delivers fast, accurate, and efficient delivery services.

In building its logistics network, Amazon has established over 400 operational centers, 150 sorting centers, and 50 air cargo hubs worldwide, with coverage spanning 185 countries and regions. Its Prime membership service, offering fast delivery options like same-day and next-day shipping at an annual fee of \$139, is projected to reach 200 million members by 2025. Members spend 2.5 times more annually than non-members, making them a key driver for Amazon's core customer base. To boost delivery efficiency, the company has heavily invested in air cargo and drone delivery. Its in-house cargo airline Amazon Air operates over 100 aircraft, while the drone delivery service Amazon Prime Air has achieved commercial success in countries like the U.S. and U.K., completing short-distance deliveries within 30 minutes [3].

In supply chain integration, Amazon employs a hybrid model combining in-house operations and third-party platforms. This approach allows the company to maintain control over core product categories through its own operations, ensuring product quality and delivery efficiency, while simultaneously expanding its market share by enriching product offerings through Amazon Marketplace. By 2025, third-party sellers accounted for 62 % of total sales on the platform. By providing FBA (Fulfillment by Amazon) services, Amazon offers integrated solutions including warehousing, delivery, and customer service to third-party sellers. This not only enhances operational efficiency for sellers but also strengthens Amazon's logistics network advantages, creating a win-win ecosystem of "platform-seller-consumer." [74] (figure 2.5).

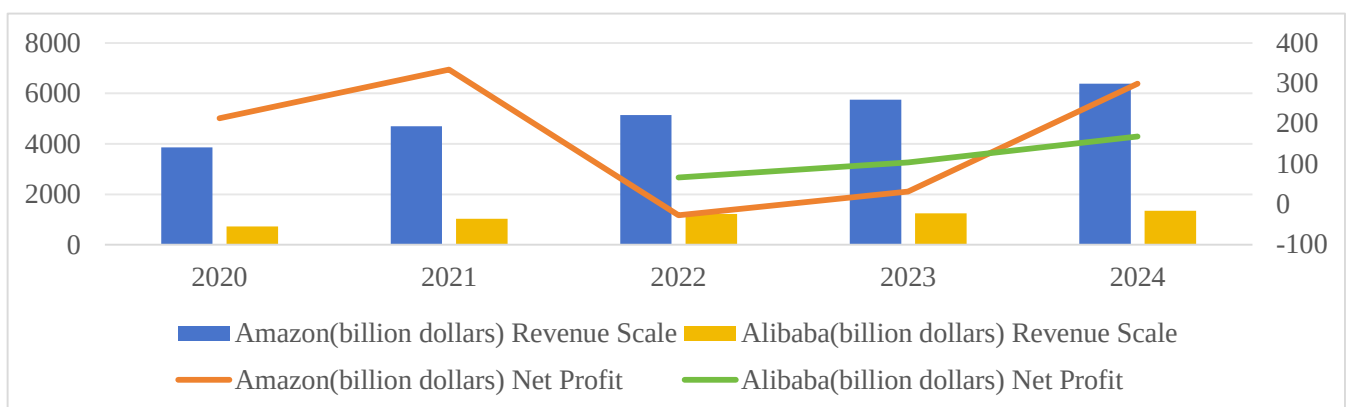


Figure 2.5 – Amazon and Alibaba's Revenue Scale and Net Profit from 2020 to 2024

Take Amazon and Alibaba as examples. According to Figure 2.5, from the development scale of Amazon and Alibaba from 2020 to 2024, in terms of revenue scale, Amazon maintained an absolute lead. In 2020, with a revenue of 386.064 billion US dollars, it pulled a gap of 72 billion US dollars from Alibaba. In the following five years, it continued to expand, reaching 637.959 billion US dollars in 2024. Although Alibaba has been growing steadily, increasing from 72 billion US dollars to 134.5 billion US dollars, its scale is still less than a quarter of that of Amazon [3].

This gap is closely related to the different core businesses and market layouts of the two companies: Amazon has achieved continuous growth and expansion in multiple businesses, with a diversified business structure. Except for 2022 when its growth rate dropped to 9.5 % due to global supply chain fluctuations, the growth rate in the other years remained above 10 %; while Alibaba mainly operates through a third-party platform model. In the early stage, it relied on e-commerce businesses such as Taobao and Tmall. After 2023, it gradually shifted towards cloud computing and cross-border e-commerce, with overall growth slowing down, and its international business is still in the investment stage [3].

In terms of net profit revenue, the fluctuation trajectories of the two companies are completely different. Amazon experienced a turning point from high profits to short-term losses and then a strong rebound. From 2020 to 2021, its net profit increased from 21.3 billion US dollars to 33.4 billion US dollars. In 2022, due to the fluctuations in global supply chains and excessive expansion after the pandemic, as well as the soaring costs of logistics and human resources, it suffered a loss of 2.7 billion US dollars. However, through its cost control and the support of AWS to its profits, Amazon's net profit rebounded strongly to 29.9 billion US dollars in 2024. Different from Amazon's ups and downs, Alibaba's net profit attributable to the parent company has shown a steady upward trend since its business began to tilt towards cross-border e-commerce in 2022. From 2022 to 2024, its net profit attributable to the parent company increased from 6.7 billion US dollars to 16.8 billion US dollars. Although the increase is gradual and the profit conversion rate is lower than that of Amazon, it is still more stable compared to Amazon's development [3].

In terms of revenue size and net income as a whole, amazon's growth in the global e-commerce market is more mature. Relying on its aws high margin business and the support of its mature prime member system, amazon also has an advantage in the global e-commerce market competition. However, alibaba has also achieved steady profit growth by continuously optimizing its cost structure and scale system and taking a place in the international market competition. In the context of globalization, the differences in local and regional markets lead to different business models, strategic goals and industry development focus.

Business Model: From "Goods Sales" to "Full-scenario Service" Extension. Amazon's business model has always been customer-centric, evolving from book sales to a full range of product offerings, and further diversifying into service domains, ultimately forming a hybrid' product + service' model.

In its product category expansion strategy, Amazon has adopted a "high-frequency essentials to low-frequency niche" approach. Starting with standardized products like books and audiovisual items, the platform has progressively expanded into electronics, home goods, apparel, footwear, and food & beverage categories. By 2025, Amazon's product catalog will exceed 120 million items, catering to consumers' diverse needs. Notably, the food & beverage category has seen rapid online penetration. Through the integration of Amazon Fresh and Whole Foods Market, same-day delivery for fresh produce has been achieved. In 2025, this category's sales surpassed \$80 billion, making it one of the platform's fastest-growing categories.

In its service expansion strategy, Amazon has diversified from e-commerce into multiple business segments including digital streaming (Prime Video), cloud computing (AWS), artificial intelligence (Alexa), and offline retail (Whole Foods Market, Amazon Go), building a comprehensive ecosystem covering consumption, entertainment, and technical services. Prime Video, with over 200 million paying subscribers, attracts users through exclusive content, indirectly boosting Prime membership retention. Amazon Go's unmanned stores adopt a "take-and-go" payment model, combining the strengths of online and offline retail. By 2025, it had opened more than 500 stores globally, establishing itself as a benchmark in new retail.

Globalization Strategy: Localization Operation and Global Resource Integration. Amazon's globalization strategy centers on "localized operations," achieving deep market penetration worldwide by establishing localized logistics networks, operational teams, and compliance systems in target markets. As of 2025, Amazon has set up localized websites in over 20 countries and regions and established logistics centers in more than 30 countries, continuously deepening its global footprint [3].

In mature markets, Amazon has solidified its market leadership by enhancing logistics capabilities and expanding product categories. In the U.S., the company commands over 35 % of the e-commerce market share, continuously improving service experiences through competition with Walmart and eBay, and introducing innovative services like "buy now, pay later" and "same-day delivery." In Europe, Amazon adheres to EU regulations such as the Digital Markets Act, strengthening data security and consumer protection. By leveraging localized warehousing and delivery systems, it enhances user experience, with projected sales exceeding \$400 billion in the European market by 2025.

In emerging markets, Amazon has adopted a "partnership + localization" strategy to steadily expand its market share. In India, the company collaborates with local businesses to introduce payment methods and logistics solutions tailored to local consumer preferences, with sales projected to exceed \$30 billion by 2025. In Southeast Asia, Amazon has gained market influence by competing differently with local platforms like Shopee and Lazada, focusing on premium categories and cross-border products [3].

Alibaba was founded in 1999, starting with B2B business and gradually developing into a comprehensive commercial ecosystem covering multiple fields such as B2C, C2C, cross-border e-commerce, fintech, logistics, and cloud computing. By 2025, Alibaba's e-commerce sales are expected to reach \$1.9 trillion, with China's market share exceeding 40 % and over 1 billion global active users. The core of its success lies in its open platform strategy, ecological layout, and localized innovation [1] (figure 2.6).

Ecological Construction: Open Platform and Full Industry Chain Collaboration. Alibaba's core strategy is to build an open business ecosystem by connecting merchants, consumers, logistics providers, financial institutions, and other stakeholders through its platform, enabling coordinated development across the entire industrial chain. The

ecosystem is anchored by four pillars: e-commerce platforms, fintech, logistics networks, and cloud computing. These pillars mutually empower each other, creating a powerful network effect.

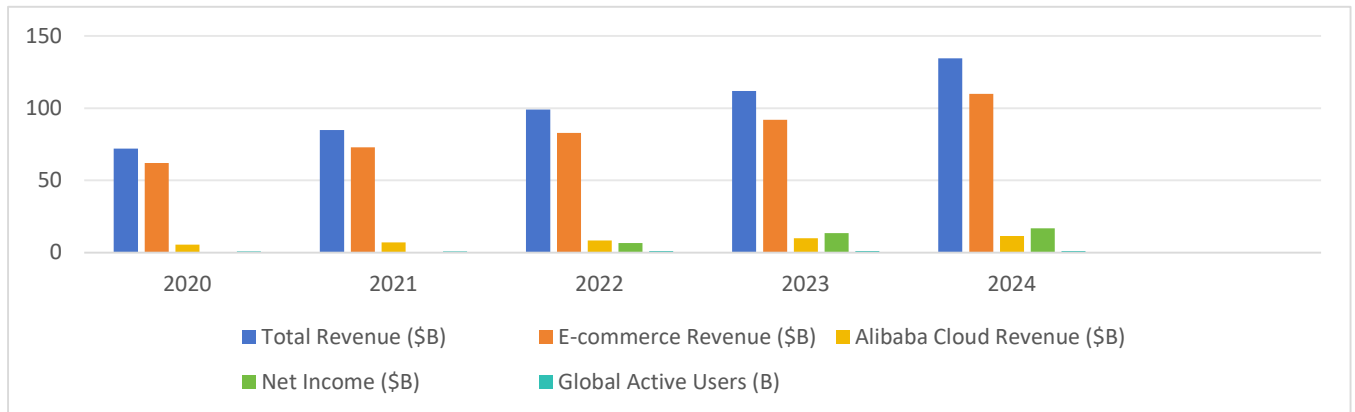


Figure 2.6 – Alibaba Core Business and Growth Data (2020-2024)

At the e-commerce platform level, Alibaba has built a full-scenario e-commerce matrix covering B2B (1688.com), C2C (Taobao), B2C (Tmall), and cross-border e-commerce (AliExpress, Lazada) to meet the needs of different customer groups. Taobao, as a C2C platform, has attracted over 10 million merchants with more than 200 million product categories, becoming the largest online marketplace in China [1] Tmall focuses on branded products, attracting over 200,000 global brands, making it the core platform for brand digital transformation; AliExpress and Lazada specialize in cross-border e-commerce, covering more than 200 countries and regions worldwide, with cross-border e-commerce sales expected to exceed \$300 billion by 2025.

In the realm of fintech, Alipay-operated by Ant Group (a subsidiary of Alibaba)-has become a trusted payment solution for the e-commerce ecosystem. By 2025, Alipay boasts over 1.3 billion active users worldwide, with mobile payment transactions exceeding 150 trillion yuan. More than just addressing trust issues in e-commerce, Alipay has expanded into financial services like Yu'e Bao, Huabei, and Jiebei, providing financial support to merchants and consumers. This creates a seamless "payment-finance-consumption" ecosystem.

At the logistics network level, Cainiao Network has established a global smart logistics network through its "self-built + collaborative" model. By 2025, Cainiao operates

over 100 overseas warehouses worldwide, with its logistics network covering 220 countries and regions, reducing cross-border delivery time to an average of under 7 days. Cainiao's intelligent logistics system optimizes delivery routes through big data analysis, enhancing efficiency and reducing costs. In 2025, the company processed over 150 billion parcels, becoming one of the world's largest logistics service providers [10].

In the field of cloud computing, Alibaba Cloud provides technical support to merchants within the e-commerce ecosystem, including website construction, data analysis, marketing promotion, and other services (table 2.5).

Table 2.5 – Alibaba Ecosystem Architecture [10]

Layer	Platforms/Services	Core Functions
E-commerce Layer	Taobao (C2C), Tmall (B2C), 1688 (B2B), AliExpress, Lazada	Transaction platform
Financial Layer	Alipay, Yu'e Bao, Huabei/Jiebei, MYbank	Payment and financial services
Logistics Layer	Cainiao Network, Warehousing, Distribution, Self-pickup points	Logistics and delivery
Technology Layer	Alibaba Cloud, DAMO Academy, DingTalk, AutoNavi	Technology infrastructure
Synergy Effects	Traffic sharing, Data integration, Payment, Logistics support, Technology empowerment	-

By 2025, Alibaba Cloud's market share ranks third globally and first in China, serving over 4 million enterprise customers. Alibaba Cloud's technical capabilities not only empower e-commerce businesses but also provide digital solutions for multiple sectors such as government, finance, and healthcare, becoming the core vehicle for Alibaba's technology output [31].

Localization innovation: business model iteration tailored to the China market. Alibaba's success is inseparable from its profound understanding of the China market and localized innovation. Its business model has always been iteratively upgraded around the needs of Chinese consumers and the market environment, evolving from early e-commerce platforms to live-streaming e-commerce and instant retail, continuously leading industry trends.

First, as a pioneer in live-streaming e-commerce, Alibaba introduced live-streaming sales to the e-commerce sector, establishing a new "anchor-merchant-consumer" ecosystem through Taobao Live that became the primary sales driver. By 2025, Taobao Live's annual transaction volume exceeded 1.2 trillion yuan, accounting for 63 % of Alibaba's total e-commerce revenue. It has nurtured top-tier anchors like Li Jiaqi and Viya, creating a diversified live-streaming ecosystem combining "brand live-streaming + influencer live-streaming + store live-streaming." This model not only enhances product presentation and interactivity but also shortens the consumer decision-making cycle, reducing new product launch timelines from months to days, making it a core channel for brand marketing [1].

Secondly, Alibaba has established itself as a pioneer in instant retail. To meet consumers' growing demand for convenience, the company has significantly expanded its instant retail operations through platforms like Taoxianda and Ele.me, delivering fresh produce, daily necessities, and pharmaceuticals within minutes or even hours. By 2025, Alibaba's instant retail network will cover over 2,000 cities and counties nationwide, with more than 1 million partner stores and an annual transaction volume exceeding 300 billion yuan, emerging as a key growth driver alongside traditional e-commerce. The expansion of instant retail has not only diversified e-commerce applications but also accelerated the deep integration of online and offline retail, creating a new model where customers can "order online and receive delivery offline."

Third, Alibaba's dedicated players in the lower-tier markets. Through platforms like Taobao Special Edition and Juhuasuan, the company targets consumption demands in lower-tier markets (third-and fourth-tier cities and rural areas), offering high-value products and convenient shopping services. By 2025, users in these markets will account for 55 % of Alibaba's total e-commerce users, becoming the core driver of user growth. To address logistics challenges in rural areas, Alibaba has optimized its logistics network through Cainiao Network, establishing a three-tier system covering counties, towns, and villages. This initiative enables next-day delivery in rural regions, driving consumption upgrades in these areas.

Merchant Empowerment: From Traffic Support to Digital Transformation Servi

ces. Alibaba steadfastly upholds its core values of "Customers First, Employees Second, Shareholders Third," positioning merchants as key ecosystem partners. Through comprehensive empowerment services, the company helps merchants achieve digital transformation and growth. Its merchant empowerment system covers multiple dimensions, including traffic support, data analytics, marketing tools, and financial service [1].

In terms of traffic support, Alibaba leverages the traffic distribution mechanisms of Taobao and Tmall to ensure fair competition opportunities for small and medium-sized merchants. It also launches initiatives like the "10 Billion Subsidy" and "Daily Special Sales" to attract customers and boost product visibility. Through Alibaba Mama's marketing platform, merchants receive precise advertising services, enabling personalized marketing campaigns to enhance promotional efficiency.

In data analytics, Alibaba empowers merchants with real-time sales data, user profiles, and market trend reports through tools like Business Advisor, enabling them to optimize product selection, pricing strategies, and marketing plans. Business Advisor's Market Insight feature provides real-time monitoring of industry dynamics and competitor performance, offering decision-making support. Its User Profile feature accurately captures consumer characteristics such as age, gender, and spending habits, facilitating targeted marketing.

In financial services, Ant Group provides merchants with funding solutions including online business loans and credit loans to address financing challenges for small and medium-sized businesses. By 2025, its online business loan program had served over 30 million SMEs, with total disbursements exceeding 5 trillion yuan at an average interest rate 20 % lower than traditional financial institutions. Additionally, Ant Group offers cross-border payment and foreign exchange settlement services to reduce transaction costs for international trade.

Globalization Layout: Ecological Output with Cross-border E-commerce as the Core. Alibaba's globalization strategy centers on cross-border e-commerce, connecting China's supply chain advantages with global consumer demand through platforms such as AliExpress, Lazada, and Alibaba.com, while promoting the global expansi

on of its business ecosystem.

AliExpress, as Alibaba's cross-border e-commerce platform for global consumers, covers more than 200 countries and regions. By 2025, its sales exceeded \$200 billion, making it one of the world's largest cross-border e-commerce platforms. Through the "China sellers + overseas warehouses" model, AliExpress achieves rapid product delivery. It also launched the "AliExpress Premium" membership service, offering value-added services such as free shipping and after-sales support to enhance user experience.

Lazada, Alibaba's Southeast Asian e-commerce platform, has emerged as the region's leading marketplace through localized operations and ecosystem integration. As of 2025, it boasts over 300 million active users across six Southeast Asian countries, jointly capturing more than 70 % of the region's e-commerce market with Shopee. By adopting Alibaba's proven models like live commerce and mobile payments while tailoring them to local consumer preferences-including cash-on-delivery and installment plans-Lazada has significantly boosted the growth of Southeast Asia's e-commerce sector (table 2.6).

Table 2.6 – Amazon vs. Alibaba: Core Strategy Comparison [3]

Comparison Dimension	Amazon	Alibaba
Core Strategy	Technology-driven precision operations	Open platform ecosystem development
Business Model	Self-operated + Third-party (asset-heavy)	Pure platform → asset-light → asset-heavy
Revenue Structure	E-commerce + AWS + Advertising + Subscriptions	E-commerce + Cloud + Local services + Entertainment
Technology Investment Direction	Front-end experience + Back-end supply chain	Ecosystem collaboration + Technology output
Logistics System	Self-built global logistics network	Collaborative smart logistics network
Membership System	Prime (200M members)	88VIP (30M+)
Globalization Path	Localized operations, deep market penetration	Ecosystem output, China supply chain connection
Core Advantages	Logistics efficiency + Cloud computing	Supply chain + Ecosystem synergy
Primary Markets	Europe & United States	China + Southeast Asia
Net Profit Margin	4-6 %	12-15 %

As a global leading B2B cross-border e-commerce platform, Alibaba.com connects

manufacturers in China with global buyers. In 2025, the platform's transaction volume exceeded \$1 trillion, becoming a core channel for global small and medium-sized enterprises (SMEs) trade.

By providing integrated solutions such as letter of credit services, cross-border logistics, and supply chain finance, Alibaba.com has lowered the barriers to cross-border trade for SMEs and promoted the inclusive development of global trade.

2.3 Innovative Practices of Other Emerging E-commerce Platforms

In the global e-commerce market dominated by Amazon and Alibaba, a group of emerging e-commerce platforms have rapidly risen as new forces in the industry by leveraging differentiated positioning, innovative business models, and technological applications. These platforms focus on niche markets, specialize in specific regions, or innovate transaction models, not only breaking the traditional competitive landscape of e-commerce but also driving the diversified development of the global e-commerce industry. This section will focus on analyzing the innovative practices of emerging platforms such as Shopee in Southeast Asia, Mercado Libre in Latin America, China's DHgate, and TikTok Shop worldwide, revealing the core logic behind their success and industry insights.

Founded in 2015, Shopee is a leading e-commerce platform in Southeast Asia, owned by Singapore's Sea Group. By leveraging its social commerce model and deep local operations, Shopee has achieved rapid growth within just a decade. In 2024, its gross merchandise volume (GMV) in the Southeast Asian market reached \$140 billion, capturing over 40 % of the region's e-commerce market share and establishing itself as a benchmark enterprise in the industry (table 2.7).

Social E-commerce Model: Reconstructing the "Grass-Planting-Conversion" Chain. Shoppe has gained deep insights into the social needs of young consumers in Southeast Asia, seamlessly integrating social features with e-commerce. By creating a closed-loop model of content seeding, social sharing, and instant conversion, it has significantly boosted user retention and conversion rates.

Table 2.7 – Shopee Core Business Data (2020-2024) [69]

Year	GMV (\$B)	Order Volume (B)	Active Users (B)	Southeast Asia Market Share
2020	35.4	2.8	0.35	25 %
2021	62.5	4.7	0.50	32 %
2022	84.5	6.8	0.65	38 %
2023	100.0	8.5	0.80	40 %
2024	140.0	11.0	1.00	42 %

In content seeding, Shopee features its built-in "Shopee Live" live streaming platform and "Feed" short video section, empowering merchants and influencers to showcase products and engage consumers through live broadcasts and short videos. As of 2025, Shopee Live boasts over 150 million monthly active users, with live commerce conversion rates exceeding traditional e-commerce platforms by more than fivefold. Merchants demonstrate product usage scenarios and key features during live streams, addressing consumer inquiries to enhance product credibility and appeal. Meanwhile, influencers cultivate a "fan economy" by sharing fashion, beauty, and home decor content, effectively driving sales.

In social sharing, Shopee has introduced viral features like "Invite Friends to Win Rewards" and "Group Buying" to encourage users to share products on platforms such as Facebook and WhatsApp, leveraging social networks to boost product visibility. The group buying feature allows consumers to purchase items at lower prices by inviting friends to join the purchase. By 2025, group orders accounted for over 30% of Shopee's total orders, making them a key source of sales.

The social commerce model thrives on leveraging social networks to cut customer acquisition costs and build trust. Southeast Asian consumers, who prioritize personal connections and word-of-mouth recommendations, find this approach perfectly aligned with their shopping habits, enabling Shopee to rapidly expand its user base in a short period.

Deep Localization Operations: Adapting to Regional Market Differences. Southeast Asia comprises multiple countries with significant differences in language, culture, consumption habits, and payment methods. Through deep localization strategies, Shopee has successfully adapted to diverse market needs, achieving comprehensive

penetration across the region.

In terms of language and cultural adaptation, Shopee supports local languages including Malay, Indonesian, Thai, and Vietnamese across its platforms in six Southeast Asian countries: Singapore, Malaysia, Indonesia, Thailand, Vietnam, and the Philippines. The platform also launches targeted marketing campaigns that align with local festivals and cultural traditions. For instance, during Indonesia's Eid al-Fitr and Thailand's Songkran Festival, Shopee organizes themed promotions featuring local specialties and exclusive discounts to attract consumers.

In Southeast Asia, credit card penetration remains low, with cash payments and digital wallets being the predominant payment methods. Shopee has introduced tailored payment solutions for different markets: supporting local digital wallets like OVO and DANA in Indonesia, GCash in the Philippines, and MoMo in Vietnam, while also offering cash on delivery to cater to diverse consumer preferences. By 2025, digital wallet payments are projected to account for over 60 % of Shopee's total transactions, with cash on delivery making up about 20 %, effectively lowering the barrier to shopping for consumers.

In logistics system optimization, Shopee has developed its proprietary "Shopee Express" logistics brand, partnering with local logistics providers to establish a comprehensive network covering major Southeast Asian cities. To address the region's underdeveloped logistics infrastructure, Shopee has optimized warehouse layouts by building local facilities across countries, thereby reducing delivery distances. The platform also introduced services like "free shipping" and "next-day delivery" to enhance user experience. By 2025, Shopee Express will deliver to over 90% of Southeast Asian cities, with core cities achieving 2-3 day delivery times [69].

Founded in 1999, Mercado Libre is Latin America's largest e-commerce platform, often dubbed the "Amazon of Latin America." Through localized supply chain integration, fintech innovation, and comprehensive service offerings, Mercado Libre dominates the Latin American market. With projected sales of \$65 billion by 2025 and a market share exceeding 50 %, it serves 18 countries and regions across the continent, boasting over 300 million active users (table 2.8).

Table 2.8 – Mercado Libre Core Business Data (2020-2024) [57]

Year	GMV (\$B)	Revenue (\$B)	Active Users (B)	Latin America Market Share
2020	21.0	4.0	0.15	45 %
2021	30.0	5.5	0.20	48 %
2022	38.0	7.0	0.25	50 %
2023	48.0	9.5	0.30	52 %
2024e	65.0	12.0	0.35	55 %

Localization of Supply Chain Integration: Solving Regional Logistics Problems. Latin America's vast territory and underdeveloped logistics infrastructure have resulted in high cross-border logistics costs and extended delivery times, posing major challenges to e-commerce growth. Mercado Libre has successfully addressed these issues by integrating localized supply chains and establishing a logistics network that covers key Latin American markets.

In terms of warehouse infrastructure, Mercado Libre has established over 150 local warehouses across major Latin American countries, covering a total area of more than 5 million square meters, enabling localized storage and distribution of goods. Through its "Mercado Envios" logistics service, Mercado Libre provides merchants with integrated solutions including warehousing, sorting, delivery, and customer service. The delivery network covers over 95 % of Latin American cities, with core cities achieving 1-3 day delivery times. By 2025, Mercado Envios is expected to handle over 70 % of the platform's total orders, with logistics costs 25 % lower than the industry average [57].

In supply chain collaboration, Mercado Libre deeply integrates local suppliers and manufacturers to promote localized production and sales. Through its Mercado Libre Marketplace platform, it attracts small and medium-sized local businesses to join, enriching product offerings. Meanwhile, it partners with major Latin American brands to establish official flagship stores, enhancing product quality and brand influence. The localized supply chain not only reduces logistics costs and delivery time but also caters to local consumer needs, improving user satisfaction.

Full-scenario Service Layout: From E-commerce to Life Services. With e-commerce as its core, Mercado Libre has progressively expanded into lifestyle services, digital

content, and other sectors, building a comprehensive service ecosystem that enhances user lifecycle value.

In the lifestyle services sector, Mercado Libre has introduced a range of offerings including Mercado Shops physical stores, Mercado Travel booking services, and Mercado Food delivery services to meet consumers' diverse needs. By 2025, Mercado Shops had expanded to over 1,000 stores across Latin America, achieving seamless integration of online and offline operations. Meanwhile, Mercado Food's delivery network covers more than 50 major cities in the region, partnering with over 100,000 restaurants.

In the digital content sector, Mercado Libre launched its streaming service Mercado Play, offering movies, TV series, and variety shows. By integrating membership subscriptions with e-commerce, the platform has significantly improved user retention. As of 2025, Mercado Play boasts over 50 million paying subscribers, establishing itself as one of the leading streaming platforms in Latin America.

Mercado Libre's all-scenario service model has transformed it from a standalone e-commerce platform into a comprehensive lifestyle service hub. Users can now handle diverse activities—including shopping, payments, travel, food delivery, and entertainment—all within one platform, significantly boosting user engagement and loyalty.

TikTok Shop, the e-commerce division of short-video platform TikTok, has rapidly risen as a global leader in social commerce through its 'short videos + live streaming + e-commerce' model. By 2025, it had expanded to over 30 countries and regions worldwide, with GMV surpassing \$80 billion, making it one of the fastest-growing e-commerce platforms globally. Its innovative practices are primarily reflected in the deep integration of content and e-commerce, algorithm-driven precise matching, and rapid iteration of localized operations [77].

Seamless Integration of Content and E-commerce. TikTok Shop's core strength lies in seamlessly integrating short-form content like videos and live streams with e-commerce transactions, creating a streamlined 'content seeding-interest conversion-instant purchase' model that significantly enhances user shopping experience and conversion rates.

In the realm of short video product seeding, TikTok's algorithm delivers content featuring product links tailored to users' interests. By showcasing usage scenarios, efficacy

features, and comparative reviews, merchants and influencers effectively spark consumer interest. Users can simply click product links in videos to access purchase pages and complete transactions. As of 2025, TikTok Shop's short video sales conversion rate has surpassed 3 %, significantly outperforming the average of traditional e-commerce platforms.

In live commerce, TikTok Shop introduced the "TikTok Live Shopping" feature, enabling merchants and influencers to showcase products, engage with users in real-time, answer queries, and drive instant conversions. TikTok's live commerce emphasizes entertainment and interactivity, creating an exciting shopping atmosphere through features like lotteries, flash sales, and coupon giveaways to boost user engagement and purchase intent. By 2025, live commerce accounted for over 60 % of TikTok Shop's GMV, establishing it as the core transactional platform.

The seamless integration of content with e-commerce has enabled TikTok Shop to break away from the traditional linear model of 'search-price comparison-purchase' in e-commerce. By leveraging interest-driven matching, it achieves precise 'product-to-user' connections, significantly enhancing the fun and convenience of shopping (table 2.9).

Table 2.9 – TikTok Shop Global Expansion Data (2022-2024) [77]

Year	Countries Covered	GMV (\$B)	Active Merchants (M)	Live Conversion Advantage
2022	8	5	0.2	3x traditional
2023	20	20	0.8	4x traditional
2024	35	50	2.0	5x traditional

Algorithm-driven Precision Matching. Leveraging TikTok's advanced algorithmic technology, TikTok Shop achieves precise matching between content, products, and users, thereby boosting marketing efficiency and conversion rates.

In terms of user profiling, TikTok's algorithm constructs precise user profiles by analyzing multidimensional data including browsing history, interaction patterns, and purchase records, thereby gaining insights into users' interests and consumption needs. For instance, by examining the short video content users watch, the algorithm identifies their preferences for categories like fashion, beauty, and home decor. Similarly, through

analyzing user interactions and comments, it discerns their preferences regarding product pricing, features, and design styles.

In product recommendation, TikTok Shop's algorithm delivers tailored products to target users based on their profiles. Through real-time dynamic adjustments, the system continuously optimizes recommendations by analyzing user interactions (likes, comments, dwell time, and clicks), creating a closed-loop cycle of interest capture, instant delivery, and conversion. For example, when a user comments on a beauty video seeking shade information, the algorithm instantly recommends detailed product videos, color comparison content, and purchase links, reducing the conversion time from interest to purchase to just minutes.

To empower merchants, TikTok Shop introduces a dual-engine tool combining "smart product selection" and "traffic allocation". Leveraging the platform's algorithm to analyze global market trends and consumer demand gaps, it provides precise product recommendations, significantly reducing trial-and-error costs. Meanwhile, the "content quality scoring system" prioritizes high-quality live-streaming content, boosting marketing ROI by over 40 % compared to traditional ads. For instance, a Spanish niche jewelry retailer tapped into the algorithm-recommended "retro metallic style" trend, collaborated with local influencers to create short videos, and achieved a 300 % sales surge within three months, successfully breaking into the European market.

The future of the industry will be shaped by three core trends, driven by the scale expansion of the global e-commerce market, regional disparities, corporate practices, and technological innovations (table 2.10).

Table 2.10 – Major E-commerce Platforms Key Indicators Comparison [77]

Platform	Region	GMV (\$B)	Core Model	Unique Advantage
Amazon	Global	720	Self-operated + Platform	Logistics network + Prime
Alibaba	China	1200	Platform ecosystem	Full-chain coverage
Shopee	Southeast Asia	100	Social commerce	Localized operations"
Mercado Libre	Latin America	48	Comprehensive platform	Financial technology
TikTok Shop	Global	20	Content commerce	Traffic advantage
Temu	"Europe/US"	15	"Ultra-low price	Social fission

First, technological restructuring of the entire industrial chain: The deep integration of AI, blockchain, and IoT will achieve full-chain digitalization across consumption, production, and supply chains, with flexible production and smart fulfillment becoming core competitive advantages. Second, a multi-polar market landscape: Local platforms in emerging markets and ecosystem giants in mature markets engage in differentiated competition, while cross-border e-commerce serves as a crucial bridge connecting global markets.

Third, diversified consumer value: Growing demands for personalization, sustainability, and experiential consumption are driving new business models like social commerce, instant retail, and green e-commerce to become primary growth drivers.

E-commerce is transitioning from an efficiency-driven revolution to a value-reconstruction phase. Whether it's the ecosystem expansion of industry giants or the differentiated breakthroughs of emerging platforms, their core logic revolves around user-centric value creation. Technological innovation and localized adaptation will be the key to helping enterprises navigate market cycles and achieve long-term growth.

Chapter 3 Driving factors and risks of e-commerce development

3.1 Globalization and Market Competition

Deepening Globalization and Comprehensive Reconfiguration of Market Competition Landscape. The continuous deepening of economic globalization has provided a solid market foundation and cooperation basis for the cross-border development of e-commerce. The rapid popularization of e-commerce, in turn, has further accelerated the globalization process, restructured the global market competition landscape, and formed a mutually empowering and mutually promoting virtuous cycle, becoming the core underlying driving force for the sustained development of the international economy. On one hand, under the traditional international trade model, factors such as tariff barriers, non-tariff trade barriers, geographical distance, and lagging information circulation severely restricted the cross-border business scope of market entities. Enterprises needed to invest extremely high offline channel construction, market research, and offline operation costs to expand overseas markets, and only large multinational enterprises had the ability for cross-border trade. The global market competition presented an oligopoly pattern, with insufficient market vitality and low efficiency in resource allocation. However, e-commerce, relying on the digital platform of the Internet, completely broke through the limitations of time and space and policy at the shallow level, eliminating the need for enterprises to build offline overseas physical stores and multi-level distribution channels. They only needed to rely on the cross-border e-commerce platform to realize product display, customer negotiation, and online transactions for the global market in multiple countries, significantly reducing the entry barriers and operating costs for cross-border markets for enterprises [86]. According to relevant industry statistics, the comprehensive transaction costs of cross-border trade under the e-commerce model are reduced by more than 30 % compared to traditional offline foreign trade, and the trade connection efficiency is increased by more than twice. On the other hand, the reduction in market entry barriers has enabled a large number of global small and medium-sized enterprises and micro-businesses to participate in international market competition on an equal footing, completely breaking the traditional pattern of monopoly by large enterprises

in international economic markets. The global market competition entities have become more diversified and the competitive atmosphere has become more fully developed. The full competition of diversified market entities has forced enterprises in various countries to continuously optimize product quality, innovate business models, reduce redundant operating costs, and improve service quality, promoting the continuous refinement of global industrial division of labor and the continuous improvement of the efficiency of industrial chain and supply chain collaboration. At the same time, under the global market interconnection pattern, the resource endowments and industrial advantages of various countries can be fully utilized. Developed countries focus on digital services, high-end manufacturing, etc., while developing countries rely on local characteristic products and basic processing industries to connect with the global e-commerce market, forming a complementary and mutually beneficial global e-commerce economic cooperation system, continuously driving the growth of foreign trade and import and export scales of various countries, and injecting continuous core driving force for the overall expansion and improvement of the international economy. In addition, e-commerce drives the coordinated overseas expansion of related industries such as digital technology, cross-border services, and cross-border logistics, promotes the deep integration of goods trade and service trade, further expands the dimensions of global economic cooperation, and strengthens the pulling effect of globalization on the international economy (table 3.1).

Table 3.1 – Mechanisms and Effects of E-commerce Driving Globalization [80]

Mechanism Dimension	Traditional Model	E-commerce Model	Improvement
Market Entry Barrier	High (offline channels required)	Low (platform onboarding)	70 %+ reduction
Cross-border Transaction Cost	High (multiple intermediaries)	Low (disintermediation)	30 %+ reduction
Trade Connection Efficiency	Weeks to months	Days to weeks	200 %+ improvement
SME Participation	Below 5%	Over 60%	Significant increase
Global Division of Labor	Large enterprise dominated	Multi-entity collaboration	More refined
Global Resource Allocation	Lower efficiency	Higher efficiency	Significant optimization

Globalization and the Reshaping of Market Competition Landscape. The global

economic integration process continues to advance, and trade barriers between countries are gradually weakening. Digital platforms have opened up channels for global market interconnection, enabling e-commerce enterprises to directly connect with buyers and consumers all over the world, significantly expanding the market space. Under the backdrop of globalization, market competition has become more intense, forcing enterprises to continuously optimize product quality, upgrade service systems, and enhance digital operation capabilities, thereby promoting the continuous optimization and upgrading of the global industrial structure (figure 3.1).

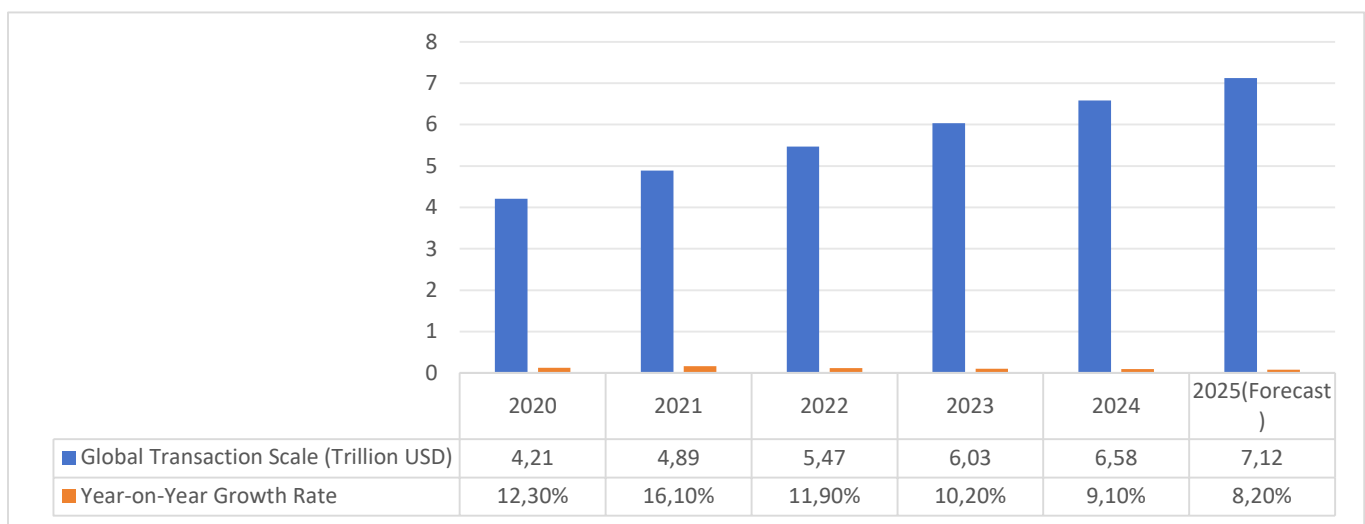


Figure 3.1 – Global Cross-border E-commerce Transaction Scale (2020-2025) [23]

Firstly, the market scale continues to expand. Cross-border e-commerce has broken the long-standing monopoly of traditional large multinational enterprises on the international trade market. Small and medium-sized enterprises no longer need to rely on traditional offline multi-level distribution channels and can directly participate in global trade, significantly reducing the threshold for foreign trade entry and activating the vitality of a large number of global market entities. Secondly, market competition continuously empowers industry innovation. The intensification of market homogenization competition has driven the rapid rise of new e-commerce models such as live-streaming e-commerce, social e-commerce, and independent website cross-border operations, constantly enriching the forms of international trade transactions. Finally, the global trade structure continues to optimize. Traditional large-scale, long-cycle bulk trade has gradually transformed into

small-batch, multiple batches, and fast-turnover online fragmented orders, making the global trade structure more flexible and diverse, effectively adapting to the international economic development rhythm of the new era.

Changes in Global Consumer Demand Drive Endogenous Growth Momentum.

The economic levels of countries around the world are constantly improving, and residents' incomes are continuously increasing. There have been fundamental changes in consumption habits and concepts. Online consumption has become fully normalized, and personalized, diversified, and convenient consumption demands are constantly upgrading, providing stable endogenous support for the international development of e-commerce (figure 3.2).

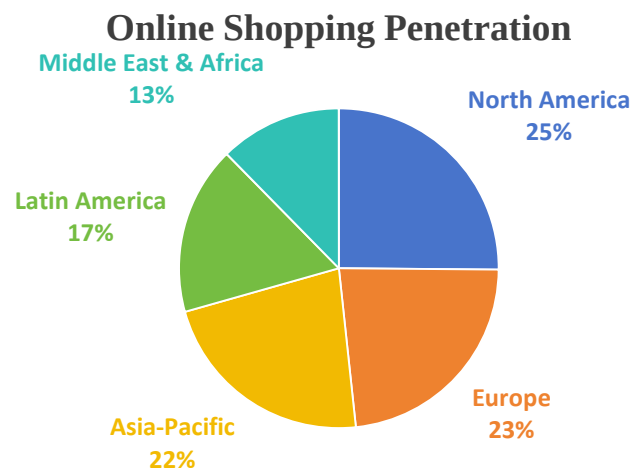


Figure 3.2 – E-commerce Online Shopping Penetration Rate by Region [23]

First, consumption habits have fully migrated online. The shopping methods of global consumers have undergone structural changes. Online ordering, cross-border shopping, and global product selection have become the mainstream consumption models, while the proportion of traditional offline shopping continues to decline, providing a huge consumer base for cross-border e-commerce.

Second, consumption demands are upgrading towards quality and diversity. Consumers are no longer satisfied with basic living goods. The demand for light luxury products, beauty and skincare, home goods, and niche imported products is rapidly increasing, driving the continuous expansion of cross-border e-commerce categories and

market space.

Third, emerging consumer markets are rapidly rising. Regions such as Southeast Asia, Latin America, and the Middle East have a large base of young people, and the internet penetration rate is rapidly increasing. The demand for online shopping is strong, making them new core growth poles for global e-commerce and continuously driving the expansion of international e-commerce trade scale.

3.2 Changes in Consumer Demand

Iterative Upgrade of Global Consumption Demand and Continuous Expansion of Consumption Market The structural changes in global residents' consumption demand and the comprehensive upgrade of consumption concepts are the core market driving forces for the sustained development of e-commerce and its subsequent promotion of international economic growth (table 3.2).

Table 3.2 – Global Consumer Demand Trend Analysis [55]

Consumer Trend	Traditional Characteristics	Emerging Characteristics	E-commerce Fit	Market Potential
Convenience	Offline purchase, time-consuming	Online order, door-to-door	★★★★★	Very High
Personalization	Standardized products	Customized, differentiated"	★★★★★	Very High
Quality	Brand-oriented	Quality + value for money	★★★★☆	High
Socialization	Independent decision-making	Social recommendation, seeding	★★★★★	Very High
Instantaneity	3-7 days delivery	Next-day, hour delivery	★★★★☆	Medium-High
Sustainability	Low attention	Green consumption emerging	★★★★☆	Medium-High

With the steady improvement of economic development levels in various countries and the continuous growth of per capita disposable income of residents, the global consumption market has already moved beyond the single and basic stage of subsistence consumption and gradually shifted to a new stage of personalized, quality-oriented, diversified, and convenient consumption. The profound transformation of consumption demand is highly consistent with the online, diversified, efficient, and global business

characteristics of e-commerce, providing a broad market space for the development of cross-border trade.

From the perspective of consumption convenience, the current global residents' living pace is continuously accelerating. The traditional offline cross-border consumption and offline foreign trade procurement models are time-consuming, cumbersome, and have limited selection ranges, which have become difficult to meet the efficient and convenient consumption demands of modern consumers. E-commerce relies on online trading platforms, allowing consumers to conveniently select and purchase unique and high-quality products from various countries around the world without leaving their homes. It is not restricted by the business hours or geographical locations of offline stores. The entire consumption process, including cross-border ordering, online payment, and delivery to the doorstep, significantly enhances the consumption experience and willingness of global consumers, continuously activating the potential of the global consumption market. From the perspective of personalized and diversified consumption demands, consumers from different countries, regions, and age groups have significant differences in consumption preferences and product demands. The traditional physical foreign trade market is limited by channels and inventory, making it difficult to precisely match the niche, differentiated, and personalized consumption demands. However, e-commerce relies on big data's precise profiling technology, which can accurately capture the consumption preferences and habits of consumers worldwide, and provide targeted products.

At the same time, a large number of cross-border e-commerce merchants can offer diversified, differentiated, and customized products and services, precisely matching the new trends of global personalized consumption, and continuously exploring the potential of the segmented consumption market. Simultaneously, emerging economies' consumption markets are rapidly rising. The young consumer groups in Southeast Asia, the Middle East, and Latin America have a large scale, and the internet penetration rate continues to increase. The strong online consumption willingness has made them a new core growth pole for cross-border e-commerce. The continuous expansion of global consumption demand and the continuous upgrading of consumption structure have driven the

cross-border transaction scale of e-commerce to steadily increase year after year, leading to the continuous expansion of global cross-border commodity circulation scale, stimulating the economic growth of various countries, and at the same time, forcing the upstream production, processing, logistics, and service-related industries to develop collaboratively, forming a "consumption-driven e-commerce development, e-commerce-driven economic growth" virtuous cycle, continuously consolidating the consumption foundation for the steady development of the international economy.

3.3 Bottlenecks in Logistics and Payment Systems

The unsmooth operation of the cross-border logistics system has created a bottleneck in physical circulation.

The logistics system, as the core physical support for cross-border e-commerce trade and the physical circulation of goods, is the key link connecting global merchants and consumers. The construction level and operational efficiency of the logistics system directly determine the quality of cross-border e-commerce trade development and profoundly affect the international economic and trade circulation order. Currently, the development of the global cross-border logistics system is unbalanced, the infrastructure construction is not complete, and the logistics operation management is not standardized (table 3.3).

Table 3.3 – Global Major Regional Logistics Infrastructure Comparison [19]

Region	Warehouse Facilities Score	Cold Chain Coverage	Digitalization Level	Cross-border Delivery (days)	Logistics Cost % of Product Value
North America	9.2/10	85 %	High	3-5	8-12 %
Europe	9.0/10	80 %	High	3-5	8-12 %
China	8.5/10	70 %	High	2-4	6-10 %
Southeast Asia	5.5/10	35 %	Medium	7-14	15-25 %
Latin America	5.0/10	30 %	Medium-Low	10-20	18-28 %
Africa	3.5/10	15 %	Low	15-30	25-40 %
Middle East	6.0/10	40 %	Medium	7-12	15-22 %

These problems have led to serious circulation bottlenecks, which not only restrict

the high-quality development of e-commerce itself but also slow down the efficiency of international economic and trade circulation and breed multiple economic operation risks.

From the perspective of infrastructure construction, the allocation of logistics resources in different regions around the world is significantly uneven. The logistics infrastructure in developed countries such as Europe and the United States is well-established, with advanced cross-border logistics infrastructure including ports, airports, warehouses, and cold chain facilities, as well as high levels of logistics intelligence and digitalization. However, most developing countries and underdeveloped regions have weak logistics infrastructure, insufficient professional cross-border storage facilities, low coverage of cold chain logistics, and an incomplete urban-rural logistics distribution network. The cross-border transportation of goods has multiple transfer links, outdated loading and unloading equipment, and is prone to problems such as damage, loss, and delays, seriously affecting the efficiency of cross-border e-commerce transaction performance.

From the perspective of logistics operation costs and timeliness, affected by multiple factors such as international oil price fluctuations, geopolitical conflicts, insufficient cross-border transportation capacity, and complex customs clearance procedures in multiple countries, the global cross-border logistics costs have remained high and fluctuated sharply for a long time. The prices of cross-border shipping and air transportation have fluctuated significantly on a regular basis, and the operating costs of small-scale cross-border e-commerce enterprises have sharply increased. At the same time, unstable customs clearance policies, inconsistent inspection standards, and delays in cross-border transportation and transfer have led to difficulties in ensuring the delivery time of cross-border logistics, with delivery periods ranging from several days to several months, seriously reducing the shopping experience of consumers and restricting the expansion of the cross-border e-commerce market.

From the perspective of cross-border logistics coordination management, the global has not yet formed a unified cross-border logistics coordination supervision and information sharing mechanism. The operational standards, logistics tracking systems, and after-sales claim rules of different national logistics enterprises are all different. The

traceability of cross-border logistics goods is difficult, and the problem of information asymmetry is prominent. Once there are problems such as damage, loss, or incorrect delivery of goods, the cross-border claim process is complex, the responsibility division is ambiguous, and the rights protection is extremely difficult. The multiple bottlenecks in the logistics field not only directly restrict the expansion of cross-border e-commerce trade scale but also lead to a decline in global circulation efficiency, an increase in trade performance risks, and a significant impact on the stability and continuity of international economic and trade exchanges. They have become important physical obstacles hindering the empowerment of e-commerce in international economic development.

The lack of supervision of the cross-border payment system breeds risks in funds security and finance.

The payment settlement system is the core key for the circulation of funds in cross-border e-commerce transactions. A standardized, secure, efficient, and compliant cross-border payment system is an important foundation for ensuring the successful completion of cross-border e-commerce transactions, maintaining the orderly circulation of global cross-border funds, and stabilizing the international financial and economic order. Currently, the development of global cross-border electronic payment industry far exceeds the speed of regulatory system construction. Multiple problems such as inconsistent cross-border payment standards, incomplete regulatory rules, weak security protection of funds, and fluctuation of exchange rates transmission are intertwined, forming significant payment bottlenecks, breeding various financial and transaction risks, and seriously restricting the healthy development of cross-border e-commerce, impacting the stability and continuity of international economic and financial stability (table 3.4).

Firstly, the security risks of cross-border payment are prominent. Currently, cross-border e-commerce transactions rely on various modes such as third-party cross-border payment platforms and international bank card settlement. However, some small cross-border payment platforms have incomplete compliance qualifications and weak technical protection capabilities, and there are frequent security incidents such as network hacker attacks, user payment information leakage, and fund theft. At the same time, cross-border payment has strong anonymity and concealment. Some illegal elements

take advantage of cross-border e-commerce payment channels to carry out illegal activities such as money laundering, cross-border fraud, and illegal fund transfer.

Table 3.4 – Major Cross-border Payment Problems and Risk Analysis [30]

Risk Type	Specific Performance	Impact on E-commerce	Frequency	Risk Level
Information Security	Hacking, information leakage	Reduced user trust	Medium	★★★★★
Fund Security	Platform misappropriation, fraud	Direct financial loss	Low	★★★★★
Regulatory Fragmentation	Inconsistent national policies	Increased compliance costs	Ongoing	★★★★☆
Exchange Rate Volatility	Rate changes during settlement cycle	Profit erosion	High	★★★★☆
High Transaction Fees	Multiple fee	Increased operating costs	Ongoing	★★★★☆
Long Settlement Cycles	3-7 days to arrival	Working capital pressure	Medium	★★★★☆
AML Compliance	Strict KYC/AML requirements	High compliance barriers	Ongoing	★★★★☆

This not only disrupts the normal trading order of the cross-border e-commerce market but also undermines the global regulatory system for cross-border capital flows, breeds risks of cross-border financial crimes, and endangers the financial security and economic stability of various countries.

Secondly, the global cross-border payment regulatory system is highly fragmented. The cross-border payment regulatory policies, foreign exchange management rules, and fund settlement standards vary greatly among different countries, and there is a lack of a global unified cross-border payment collaborative regulatory mechanism. Some countries have strict foreign exchange control, limiting the amount of cross-border funds settlement and the long time it takes for funds to arrive. This puts great pressure on cross-border e-commerce enterprises in terms of capital turnover. The tax collection and reporting requirements in different countries are not uniform, making cross-border payment

compliance costs high and compliance operation difficult, which easily leads to compliance and non-compliance risks.

Finally, the continuous transmission of cross-border exchange rate fluctuations and settlement cost risks. Cross-border e-commerce transactions mostly use international currencies such as the US dollar and the euro for settlement. The exchange rates of various currencies fluctuate frequently due to factors such as global economic conditions, monetary policies, and geopolitical situations. There is a time lag from placing an order to settlement and the arrival of funds in the cross-border transactions. A small fluctuation in the exchange rate can lead to a significant reduction in the profits of e-commerce enterprises. At the same time, various fees such as cross-border payment handling fees, currency exchange fees, and cross-border settlement service fees are added together, further increasing the operating costs of enterprises. Multiple payment bottlenecks and derivative risks not only affect the safety and efficiency of capital circulation in cross-border e-commerce transactions but also intensify the fluctuations in the global cross-border financial market, restrict the positive empowerment effect of e-commerce on the international economy, and even have a negative impact on the stability of foreign trade finance in various countries.

Conclusion

In conclusion, e-commerce, as a core new business model in the digital economy era, plays a significant role in driving global international economic development, but also brings multiple potential risks and challenges. Opportunities and bottlenecks coexist, as do benefits and risks. From the perspective of core driving forces, the continuous deepening of economic globalization reshapes the global market competition landscape, lowers the entry barriers for cross-border e-commerce trade, activates multiple market entities to participate in international competition, and optimizes the allocation of global industries and economic resources. The iterative upgrading of global consumer demands towards individualization, quality, and convenience continuously expands the global e-commerce consumption market, drives the steady growth of cross-border e-commerce transaction scale, and forms a virtuous cycle where consumption drives e-commerce development and e-commerce drives international economic growth.

These two core factors jointly promote e-commerce to become a key core force in stabilizing global trade, stimulating international economic recovery, and reshaping the global economic and trade landscape. From the perspective of development bottlenecks and risks, the regional imbalance of cross-border logistics infrastructure, unstable operational efficiency, and imperfect collaborative management mechanisms form the core physical bottlenecks of cross-border e-commerce commodity circulation. The fragmented cross-border payment regulatory system, weak fund security protection, and the ad of exchange rate fluctuations and compliance risks give rise to cross-border financial and transaction settlement risks. The shortcomings of the two supporting systems, logistics and payment, are intertwined and mutually influential, not only restricting the high-quality and sustainable development of e-commerce itself, but also hindering the orderly circulation of global goods and funds, and impacting the stability of international economic trade and financial order. These become the main obstacles for e-commerce to empower international economic quality improvement and efficiency enhancement.

Based on the new situation of global economic and trade development, countries in the future need to base on the principles of coordinated development and risk governance.

They should not only continuously seize the opportunities of digital e-commerce development, leverage the advantages of the global market to deeply explore global consumption potential, and continuously amplify the positive driving effect of e-commerce on the international economy; but also focus on the core bottlenecks and shortcomings of logistics and payment, accelerate the construction of cross-border logistics infrastructure, establish a global logistics collaborative information sharing and supervision mechanism, improve the global unified regulatory rules for cross-border electronic payment, and strengthen fund security protection and exchange rate risk prevention. Only by balancing development empowerment and risk prevention, filling the shortcomings of the supporting systems, regulating the market development order, and resolving various potential risks, can e-commerce and international economy be deeply integrated and coordinated, and make digital e-commerce continuously become the lasting driving force for global economic stability recovery, mutual benefit and win-win among countries, and high-quality development of global economic trade.

Among the key trends that are now setting the tone, several directions can be distinguished. First, deep technologization. Artificial intelligence and machine learning are being actively implemented in various processes: from personalization of offers and demand forecasting to automation of customer service (chat bots, AI assistants) and optimization of supply chains. Separately, it is worth noting the emerging trend for agent commerce: digital intermediaries (AI agents) take on part of the user's tasks - from searching and comparing goods to placing an order. Secondly, the merger of online and offline channels (omnichannel and phygital formats). The boundaries between them are blurred: the buyer can start choosing on the Internet, and complete the purchase in a physical store, or vice versa. Thirdly, the growth of social commerce is the integration of shopping functions directly into social networks and platforms (for example, sales via TikTok, live-commerce). Fourth, the strengthening of the role of mobile technologies: the share of purchases from smartphones and tablets continues to grow, forming a separate segment of mobile commerce. Fifth, the focus is on speed and convenience, which pushes businesses to develop logistics infrastructure (automated microcenters for order fulfillment) and implement fast delivery services. There is also a noticeable trend towards

environmental friendliness - consumers are increasingly paying attention to "green" logistics and sustainable practices in the business processes of companies.

In general, it can be predicted that in the coming years, e-commerce will continue to deepen integration with other areas (fintech, media, logistics), and competition will shift to the plane of not just the availability of technologies, but the ability to effectively combine them to create a unique and seamless customer experience. The success of companies in this environment will be determined by the ability to balance between innovation, sustainability of business models and attention to changing consumer expectations.

References

- 1 Alibaba Group. Annual Reports (2020–2025). URL: <https://www.alibabagroup.com/en/ir/home> (access date: 28.04.2026).
- 2 Allbirds. Annual Report 2023. URL: <https://investors.allbirds.com> (access date: 18.04.2026).
- 3 Amazon. Annual Reports (2020–2024). URL: <https://www.amazon.com/investor-relations> (access date: 08.04.2026).
- 4 Anker Innovations. Annual Report 2023. URL: <https://www.anker.com/investors> (access date: 23.04.2026).
- 5 Ant Group. Sustainability and Business Reports (2023–2024). URL: <https://www.antgroup.com/en/ir> (access date: 12.04.2026).
- 6 Amazon Web Services. Business Metrics 2023–2024. URL: <https://aws.amazon.com/about-aws> (access date: 19.04.2026).
- 7 Axie Infinity. Ecosystem Report 2023. URL: <https://axieinfinity.com> (access date: 05.04.2026).
- 8 BCG (Boston Consulting Group). Global Payments Report 2023. URL: <https://www.bcg.com/publications> (access date: 15.04.2026).
- 9 Berners-Lee, T. Weaving the Web. HarperSanFrancisco. 1999. URL: https://archive.org/details/isbn_9780062515872 (access date: 05.04.2026).
- 10 Cainiao Network. Smart Logistics White Paper 2023. URL: <https://www.cainiao.com/en> (access date: 13.04.2026).
- 11 Carousell. Annual Impact Report 2023. URL: <https://www.carousell.com/about> (access date: 04.04.2026).
- 12 Casper. Annual Report 2023. URL: <https://investors.casper.com> (access date: 14.04.2026).
- 13 China Government Procurement (China Government Procurement Cloud). Annual Report 2023. URL: <http://www.ccgp.gov.cn> (access date: 19.04.2026).
- 14 China Internet Network Information Center. Statistical Report on Internet Development in China 2023. URL: <https://www.cnnic.net.cn> (access date: 07.04.2026).

- 15 Coupang. Business Report 2023. URL: <https://ir.coupang.com> (access date: 04.04.2026).
- 16 Couture, V., Faber, B., Gu, Y., & Liu, L. Connecting the Countryside via E-Commerce: Evidence from China // American Economic Review: Insights. 2021. № 3(1). P. 35–50.
- 17 DappRadar. NFT and Blockchain Gaming Report 2023. URL: <https://dappradar.com/reports> (access date: 07.04.2026).
- 18 Deloitte. Global E-commerce Consumer Trends 2023. URL: <https://www.deloitte.com> (access date: 19.04.2026).
- 19 DHL. Global Logistics Report 2023. URL: <https://www.dhl.com/global-en/home/about-us.html> (access date: 10.04.2026).
- 20 Dollar Shave Club. Business Update 2023. URL: <https://www.dollarshaveclub.com> (access date: 13.04.2026).
- 21 Douyin (TikTok China). E-commerce Business Report 2024. URL: <https://www.douyin.com> (access date: 12.04.2026).
- 22 EBay. Annual Report 2023. URL: <https://investors.ebay.com> (access date: 22.04.2026).
- 23 EMarketer. Global E-commerce Forecasts and Reports (2020–2025). URL: <https://www.emarketer.com> (access date: 24.04.2026).
- 24 Etsy. Annual Report 2023. URL: <https://investors.etsy.com> (access date: 23.04.2026).
- 25 European Commission. VAT e-commerce package implementation report 2021. URL: https://ec.europa.eu/taxation_customs (access date: 27.04.2026).
- 26 European Commission. Digital Markets Act (DMA) and e-Procurement Directive 2022. URL: <https://ec.europa.eu/digital-single-market> (access date: 15.04.2026).
- 27 Fan, T., Tang, L., & Sun, L. Distance and e-commerce: The role of online retail in China's intercity trade // Journal of Urban Economics. 2017. № 100. P. 1–15.
- 28 FedEx. Annual Report 2023. URL: <https://investors.fedex.com> (access date: 19.04.2026).
- 29 FlashEx (China FlashEx). Business Data Report 2023. URL:

<https://www.flashexpress.com> (access date: 10.04.2026).

30 Financial Stability Board. Cross-border Payments Report 2023. URL: <https://www.fsb.org> (access date: 18.04.2026).

31 Gartner. Cloud Infrastructure as a Service Market Share 2023. URL: <https://www.gartner.com> (access date: 19.04.2026).

32 Government e-Marketplace, India. Annual Report 2023. URL: <https://gem.gov.in> (access date: 18.04.2026).

33 German Federal Ministry of Finance. Public Procurement Statistics 2023. URL: <https://www.bundesfinanzministerium.de> (access date: 14.04.2026).

34 Global Data. Second-hand and Circular Economy Market Report 2023. URL: <https://www.globaldata.com> (access date: 18.04.2026).

35 Gojek. Gojek Annual Impact Report 2023. URL: <https://www.gojek.com> (access date: 13.04.2026).

36 Google. Annual Report 2023. URL: <https://abc.xyz/investor> (access date: 10.04.2026).

37 Google, Temasek, & Bain & Company. e-Conomy SEA Report 2023. URL: <https://www.bain.com/insights/e-conomy-sea> (access date: 12.04.2026).

38 Gorillas. Operational and Impact Report 2023. URL: <https://www.gorillas.com> (access date: 18.04.2026).

39 Grab. GrabHealth Annual Report 2023. URL: <https://www.grab.com/sg> (access date: 18.04.2026).

40 Groupon. SEC Filing 2011. URL: <https://www.sec.gov> (access date: 23.04.2026).

41 IBM. Food Trust Blockchain Case Study 2020. URL: <https://www.ibm.com/blockchain/food-trust> (access date: 28.04.2026).

42 IKEA. Annual Report & AR Engagement Data 2023. URL: <https://www.ikea.com> (access date: 15.04.2026).

43 Instagram (Meta Platforms). Business Report 2023. URL: <https://business.instagram.com> (access date: 14.04.2026).

44 ITU (International Telecommunication Union). Global Connectivity Report

2023. URL: <https://www.itu.int> (access date: 08.04.2026).

45 Jack Wolfskin. Annual Sustainability Report 2023. URL: <https://www.jack-wolfskin.com> (access date: 28.04.2026).

46 JD Logistics. Smart Warehousing Data 2023. URL: <https://www.jdl.com> (access date: 10.04.2026).

47 Jumia. Annual Report 2023. URL: <https://investor.jumia.com> (access date: 14.04.2026).

48 Jungle Scout. Consumer Trends Report 2023. URL: <https://www.junglescout.com> (access date: 19.04.2026).

49 Korean Public Procurement Service. Annual Report 2023. URL: <https://www.pps.go.kr> (access date: 11.04.2026).

50 Kredivo. Indonesia E-commerce Consumer Behavior Report 2023. URL: <https://www.kredivo.com> (access date: 10.04.2026).

51 Kuaishou. E-commerce Business Report 2023. URL: <https://www.kuaishou.com> (access date: 21.04.2026).

52 Laudon, K. C., & Traver, C. G. E-commerce 2021: Business, Technology, Society. Pearson, 2021. URL: https://archive.org/details/ecommercebusines0000laud_p2x5 (access date: 11.04.2026).

53 Lazada. Annual Business Report 2023. URL: <https://www.lazada.com> (access date: 18.04.2026).

54 Maersk. TradeLens Performance Metrics 2023. URL: <https://www.maersk.com> (access date: 08.04.2026).

55 McKinsey & Company. What shapes consumer demand in e-commerce? 2023. URL: <https://www.mckinsey.com> (access date: 14.04.2026).

56 Meituan. Holiday Consumption Data Report 2023. URL: <https://www.meituan.com> (access date: 13.04.2026).

57 Mercado Libre. Annual Reports (2021–2026). URL: <https://investor.mercadolibre.com> (access date: 08.04.2026).

58 Mercari. Sustainability Report 2023. URL: <https://www.mercari.com> (access date: 02.04.2026).

- 59 Meta (Facebook). Business Report 2023. URL: <https://investor.fb.com> (access date: 28.04.2026).
- 60 Nike. Annual Report 2023. URL: <https://investors.nike.com> (access date: 19.04.2026).
- 61 Ocado. Annual Report 2023. URL: <https://www.ocadogroup.com> (access date: 13.04.2026).
- 62 Ofek, E., & Wathieu, L. The Internet and the Future of Retail // Harvard Business Review. 2001. № 79(8). P. 80–90.
- 63 PayPal. Annual Report 2023. URL: <https://investor.paypal.com> (access date: 14.04.2026).
- 64 Pew Research Center. Internet/Broadband Fact Sheet 2023. URL: <https://www.pewresearch.org> (access date: 05.04.2026).
- 65 Pinduoduo (Temu). Business Report 2023. URL: <https://ir.pinduoduo.com> (access date: 15.04.2026).
- 66 Poshmark. Transparency Report 2023. URL: <https://www.poshmark.com> (access date: 18.04.2026).
- 67 Rakuten. Annual Report 2023. URL: <https://global.rakuten.com/corp/investors> (access date: 28.04.2026).
- 68 SAP. Ariba Network Business Review 2023. URL: <https://www.sap.com> (access date: 02.04.2026).
- 69 Sea Group (Shopee). Annual Reports (2021–2026). URL: <https://www.seagroup.com> (access date: 09.04.2026).
- 70 Sephora. Digital Innovation & AR Try-on Metrics 2023. URL: <https://www.sephora.com> (access date: 10.04.2026).
- 71 SHEIN. Business and Sustainability Disclosure 2023. URL: <https://www.sheingroup.com> (access date: 14.04.2026).
- 72 Shopify. Shopify Plus Product Overview 2023. URL: <https://www.shopify.com/plus> (access date: 17.04.2026).
- 73 Singapore Government (GovTech). e-Procurement Blockchain Pilot Report 2023. URL: <https://www.tech.gov.sg> (access date: 28.04.2026).

- 74 Statista. Digital Market Outlook – E-commerce (2021–2026). URL: <https://www.statista.com> (access date: 24.04.2026).
- 75 State Council of China. Cross-border E-commerce Comprehensive Pilot Zone Policy 2015. URL: <http://www.gov.cn> (access date: 18.04.2026).
- 76 SWIFT. Cross-border Payment Traffic Insights 2023. URL: <https://www.swift.com> (access date: 30.04.2026).
- 77 TikTok. Business Reports and E-commerce Case Studies (2023–2026). URL: <https://www.tiktok.com/business> (access date: 03.04.2026).
- 78 Timmers, P. Electronic Commerce: Strategies and Models for Business-to-Business Trading. Wiley, 1999. URL: <https://archive.org/details/electroniccommer0000timm/page/n5/mode/2up> (access date: 03.04.2026).
- 79 Uber Eats. Dynamic Pricing and Operational Data 2023. URL: <https://www.uber.com> (access date: 18.04.2026).
- 80 UNCTAD (United Nations Conference on Trade and Development). Global E-commerce Reports (2021–2023). URL: <https://unctad.org> (access date: 28.04.2026).
- 81 US Congress. Big and Beautiful Act (Online Sales Tax) 2018. URL: <https://www.congress.gov> (access date: 16.04.2026).
- 82 Walmart. Blockchain Traceability and Sustainability Reports (2020, 2023). URL: <https://www.walmart.com> (access date: 15.04.2026).
- 83 Warby Parker. Investor Relations / Business Update 2023. URL: <https://investors.warbyparker.com> (access date: 19.04.2026).
- 84 World Bank. Logistics Performance Index (LPI) 2023. URL: <https://lpi.worldbank.org> (access date: 30.04.2026).
- 85 World Economic Forum. The Future of Jobs Report 2020. URL: <https://www.weforum.org/reports> (access date: 28.04.2026).
- 86 World Trade Organization. World Trade Statistical Review / E-commerce Trade Data (2020, 2023). URL: <https://www.wto.org> (access date: 18.04.2026).
- 87 Zendesk. AI Customer Service Benchmark Report 2023. URL: <https://www.zendesk.com> (access date: 08.04.2026).
- 88 Zepeto. Virtual Influencer & Commerce Report 2023. URL: <https://www.zepeto.com> (access date: 13.04.2026).